IRRIGATED INDIA

AN AUSTRALIAN VIEW OF INDIA AND CEYLON
THEIR IRRIGATION AND
AGRICULTURE

BY THE
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WITH A MAP

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AUTHOR'S PREFACE.

The present work is a reprint of a series of newspaper articles, the product of a tour through India in the cold weather of 1890-91, undertaken at the suggestion of Mr. David Syme, proprietor of the Melbourne Age, in order to afford to the Australian public interested in irrigation, a sketch of what is being accomplished by its means in the peninsular empire of Southern Asia. It proved impossible to do this intelligibly without indicating in outline the circumstances of the country and its people, novel to colonists, unique in history, and important to all subjects of the Queen. The past as root of the present, and the present in its political, social, and religious aspects are, therefore, rapidly reviewed in the opening chapters. The physical and other conditions of the several Presidencies are next glanced at, the general character and prospects of native agriculture noted, and some chief irrigation schemes, with their lessons, briefly described. Detailed summaries of the achievements of the several Irrigation Departments and their financial results, proportionately of considerable length and in some parts a little technical, are added as an Appendix.

This volume makes no pretence to adequacy of treatment, even of its special subject. The writer is not an engineer, but having held the portfolio of Minister of Water Supply in Victoria for several years, and having in that capacity reported upon the systems of artificial watering in vogue in the United States (1885), Egypt and Italy (1887), he has gathered a sufficient acquaintance with them to become convinced of their applicability to Australian soils and climates. Both in this relation, and in his treatment of other questions relating to India, he has suited the manner of his comments, so far as he was able, to the miscellaneous audience addressed through the daily press, not hesitating to pass judgment upon the gravest issues with an easy infallibility that is almost editorial.
That many parts of the interior of the Australian Colonies need the application of water to the land to ensure success in agriculture and horticulture, and to improve pasture, has been demonstrated only too often by the rigours of recurring droughts. The fact that Victoria, South Australia, and Queensland have already legislated, while New South Wales is upon the point of legislating, to provide for irrigation in arid districts is an official recognition of the need. There are at least 10,000,000 acres on the continent commanded by water supplies ample for the maintenance of schemes such as those of Bombay, the Punjab, Southern California, Utah, or Colorado: within the next few years it is certain that several hundred thousand acres will be regularly cultivated by these means, and, judging by the experiments already instituted, with returns as large as have been obtained in the most favoured localities of the old or new worlds.

Any contribution to the study of irrigation, or exposition, however cursory, of its methods elsewhere is of possible value at the present time.

Apart from this, the future relations of India and Australia possess immeasurable potencies. Their geographical proximity cannot but exercise a very real and reciprocal influence upon the forces of national life in each, presenting to both vital problems of common interest, and possibilities of political development as vast as they are vague. The reference to such topics in these pages is slight and incidental, intended to serve as the rudest of finger-posts to such of the writer's fellow-countrymen as take a thoughtful view of their responsibilities and cherish a high ideal for the coming Commonwealth.

The writer expresses his great obligations to His Excellency the Marquis of Lansdowne, Viceroy of India, to Lord Harris and Sir James Lyall for their generous hospitality, and to their Excellencies the Earl of Hopetoun and Sir Henry Norman for letters of introduction which proved of high value. The purpose of his visit was greatly assisted by the kindness of Colonel Ardagh, private secretary to the Viceroy, Colonel Forbes, chief engineer of irrigation to the Central Government, Colonel Ottley, assistant secretary of public works, and chief of the Irrigation Department of the Punjab, Mr. G. T. Walsh, chief engineer of the Madras Presidency, Mr. C. T. Hughes, chief engineer of the Bombay Presidency, Colonel Neil, chief engineer of Bengal, Colonel Harrison, chief engineer of the North-west Provinces, Mr. R. McBride, chief engineer of Ceylon, Mr. A. G. Reid, C.M.G., C.E., Mr. T. Benton, C.E., Mr. E. Price, chief secretary of Madras, Mr. R. Blechyngen, secretary of the Agricultural Society, Calcutta, Mr. D. P. Masson, of Lahore, Mr. A. W. Ferguson, of Colombo, and Mr. Herbert Syne, his comrade in the tour. He has to thank Mr. David Syne, proprietor of the Melbourne Age, the proprietors of the Daily Telegraph, Sydney, and Messrs. Burden and Bonython, proprietors of the Advertiser, Adelaide, for permission to republish the articles which appeared simultaneously in the three journals above-named.

To the Right Hon. Sir Charles W. Dilke, Bart., M.P., and Mr. Philip Mennell, of London, he is under heavy obligations for their friendly services in seeing the work through the press.

Melbourne, Sept. 1892.
It may safely be said that the component parts of the Empire know too little of each others' idiosyncrasies and achievements. There is no need to go from under the shadow of the British flag in search of precedents for grappling with the complexities which confront the pioneers in the later developed areas under the Imperial rule. To a large extent, even on the continent of Australia, the several colonies carry on their experiments, social and economical, as though they lay abreast of alien communities, of whom pride and patriotism forbade them to learn. Federation will shortly, it is to be hoped, eradicate this fatal provincialism. And in the meantime all honour is due to those who possess sufficient individuality to break through an insularity, which having no warrant from antiquity, is vastly more absurd than that of our tradition-haunted island.

Mr. Deakin taught and—he would admit—learnt much during the time when he figured before the British public—or before that small portion of it which pays any heed to Imperial questions—during the era of what red-tapists style the "Colonial," but what those of wider vision rightly misname the "Imperial Conference of 1887."

Having acquired this lesson in cosmopolitanism, Mr. Deakin, whose future rests on the fact that he, best of all Australasian politicians, realises the truth that on the development of the internal and interior resources of the Australian Continent, and not on loan-mongering and land-booming, depends its future status as an autonomous member of the Imperial comity, recently made an observatory tour of the great irrigation works of India, the result of which is embodied in the following pages.

As the sponsor of Irrigation in Australia, Mr. Deakin has thus reinforced the arguments based on local circumstances, and illustrated by American models, with comparisons drawn from the experiences of the greatest irrigating country in the world, and that too included within the bounds of the all-climate, all-condition embracing, British Empire.
For English readers the chief interest of the book, outside of expert information, must lie in the fact that it presents an outsider's view of the work, which, largely oblivious of the economic theories which pass current as axioms at home, the British rulers of India have brought into play for the fructification, and even salvation, of their great trust towards the subject myriads of India.

To avoid misconception, the English reader must bear in mind that Mr. Deakin writes from an Australian standpoint, viewed occasionally through purely Victorian spectacles, and that for some anachronisms the fact that the articles upon which the work is based were written in the winter of 1890-91, must be accepted as sufficient apology.

There is one technical expression which Mr. Deakin in several instances makes use of, which may puzzle the general reader. It may, therefore, be explained that the term referred to—"the duty of water"—implies the area of land which a given quantity of water will irrigate. As Mr. Deakin himself puts it in a previous work on American Irrigation: "The quantity of land which any given unit of water will irrigate is governed, first, by the kind of soil, subsoil, the rainfall, temperature, and evaporation of the particular area irrigated; next by the kind of crop grown, and the method of watering it, as well as by the length of time which that land or neighbouring land has been irrigated; and lastly by its position with regard to sea-page and its capacity of capillary attraction."

P. M.

London, Dec., 1892.

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IRRIGATED INDIA.

INTRODUCTION.

INDIA AND AUSTRALIA.

Who would comprehend the interest which India has for Australia, must first understand the interest which it has for the rest of the world. This is unique, and inexhaustible, and of many phases. The first place in the visitor's curiosity is usually occupied by the external aspects of modern native life, and some architectural remains, which attest the power, opulence, and artistic taste of one or two epochs, in as striking a manner as even Egyptian ruins, or those later and more exquisite fragments which exhibit—

The glory that was Greece
And the grandeur that was Rome.

But there is much besides, vaster, more profound, and more pregnant in appeal to the thoughtful. The aspects of Nature are varied and magnificent, embracing every kind and class of spectacle, from soils fat with the recuperative fertility of inundations, to desert wastes of scorching, dun-coloured sand; from easy, lonely nooks of fruitful village fields, to sterile, rocky peaks, and fathomless depths of inaccessible gorges; from over-populated, over-cultivated river flats, sparsely settled plateaux, and savage-haunted jungles, to craggy wastes, untenanted save by some lonely herdsman, fierce refuge, or sad, outcast clan. Indeed the beauties of many climes and countries are scattered profusely throughout this mighty peninsula, limb-like rooted in its socket, so near the heart of Asia, and so magnificently mountain jointed.

Less grand, less inspiring, but as various, and more intimately interesting to most tourists, are the multitudinous branches of the human family whom it maintains in one or other of its regions, offering an infinite wealth of illustration and suggestion to the anthropologist, historian, philanthropist, and to all seekers amid the
embers of the post for the far off origins of race, language, and religion. Then there is that great political marvel—the British Raj—little more stable than in the days of Clive, though immensely expanded and more highly organised. If the Eurasians, or half-breeds, at present a despised and insignificant body, could transmute the Caucasian capacity for self-government into a new native caste, or carry into European families a sufficient strain of Hindu blood to render them climate proof, and capable of permanent residence, the British Raj would be more stable than in the days of Clive, though immensely expanded and more highly organised. If the Eurasians, or half-breeds, at present a despised and insignificant body, could transmute the Caucasian capacity for self-government into a new native caste, or carry into European families a sufficient strain of Hindu blood to render them climate proof, and capable of permanent residence, the British Raj would be more stable than in the days of Clive, though immensely expanded and more highly organised.

Another interest should be the irrigation system—bold, comprehensive, and original—by which millions are fed, a monument of British rulers. This to the sagacity, ability, and magnanimity of British rulers. This is at present despised and insignificant body, could transmute the Caucasian capacity for self-government into a new native caste, or carry into European families a sufficient strain of Hindu blood to render them climate proof, and capable of permanent residence, the British Raj would be more stable than in the days of Clive, though immensely expanded and more highly organised. If the Eurasians, or half-breeds, at present a despised and insignificant body, could transmute the Caucasian capacity for self-government into a new native caste, or carry into European families a sufficient strain of Hindu blood to render them climate proof, and capable of permanent residence, the British Raj would be more stable than in the days of Clive, though immensely expanded and more highly organised.

There are other present-day interests which can only be glanced这部份。}

The future of Northern Australia is alleged to depend upon the case is the cheapest relays could be obtained from Madras or Calcutta. The difficulty hitherto has been that the conditions imposed by the Indian Government, and its insistence upon the periodical return of its immigrants, in which respects it exactly complies with colonial requirements. If Asiatic labour is indispensable, the Hindu has his recommendations, especially if strictly limited in his absence from home, an indeed he invariably demands to be. If not the equal of the Chinese in enterprise or versatility, some of his tribes are supposed not inferior in intellect and in war. The
general nature of final consequences of the pacific intercourse between the great peninsula and the newest of continents are too remote even for speculation, though the probability is that trade relations will draw us closer year by year, that trade being to the advantage of both parties, until, if not after, our tropical territories, and future island dependencies, are well developed.

In time of war the provisioning of troops might occasion a large and sudden demand for horses and supplies generally, though in such a crisis the thoughts of Australians are certain to be absorbed in the conflict and its issues, rather than in the commercial opportunities that may offer. The situation would certainly be very serious if it were possible for the Russians to occupy the country, and find at last another of those peninsulas seawards for which their great Empire has so long been seeking. With India as a base of operations for a hostile power, this continent would be directly threatened, and though it may be doubted if we shall be strong enough, when the inevitable struggle comes, to lend any efficient aid in repelling a Moscovite attack, it would assuredly be imprudent to molest in our interest, not only as Britons, but as Australians, to any extent to our interest, not only as Britons, but as Australians, to

This is not the place to descant upon military problems, and indeed it is quite unnecessary to attempt them after the exhaustive judgment upon the situation given by so eminent an authority as Sir Charles Dilke in his "Problems of Greater Britain." All present circumstances make it appear as if the struggle of the Punjab, and Lahore, contains groups who come from the Russian borders. Turkestan, or Independent Tartary, is disappearing from the map, and the rival white races will probably be face to face before long near the south-western border of the British Empire. How they will face European troops when themselves led by European soldiers remains to be seen, but in the first days of the Mutiny, before they were cowed, they certainly fought with desperate bravery. They are ill fitted to play a daring and resolute role, and are peculiarly subject to sudden panic, begotten by superstition as much as by fear; but certain of their tribes are daring, resolute, and ferocious, and on these the main reliance must be placed. The plan for

futility, and patient persistence of the average Hindu, which enables him to resist innovation, and to assert himself, in a passive way, generation after generation, so as to keep him true, under all his obsequiousness and servility, to his national traits, beliefs, and customs, are no martial virtues, and are of no service in the field. The brunt of the battle will be borne by British regiments, inspired by traditions of the deeds of the Conquest and the Mutiny, which remain, and are likely to remain, among the heroic pages in the glorious chronicle of the race. We should not have known what innate capacity for daring, enduring, and governing, existed in the stock, if it had never struck root in India; and now that it has survived so many storms, and sealed its title with so much blood and treasure, the prize is not likely to be easily surrendered.

Carlyle says—"Consider now, if they asked us, Will you give up your Indian Empire or your Shakespeare, your English? Never have had any Indian Empire, or never have had any Shakespeare! Really, it were a grave question." And concludes: "An Indian Empire will go, at any rate, some day, but this Shakespeare does not go, he lasts for ever with us; we cannot give up our Shakespeare." Very true, though the "some day" which this rather despairing passage foresees has not yet arrived, and may be long arriving. Granting that, measuring odds and circumstances, it seems impossible for the Briton to keep his hold for another century upon this tropic empire, and its hundreds of half-civilized peoples, it must still be remembered that it has always seemed equally impossible that its little garrison, has survived crisis after crisis, and peril after peril. The miracle of valour and statesmanship by which it has been subdued, may be repeated and prolonged by the same agencies—by new troops of resolute and gallant spirits, sprung from the old race. It is, at all events, a critical issue for our young communities, which, in their pride of descent, and haughtiness of national feeling, seem apt to forget that they have made their homes neither in Europe nor America, but in Austral-Asia—Southern Asia—and their fortunes may be by this means linked in the closest manner, in trade and in strife, in peace and in war, with the great continent near to us, whose richest and most magnificent promontory rests to-day under the shadow of the same flag.

It is infinitely pleasanter, no doubt, to ignore future possibilities of this kind, shut the eyes to signs and omens of the times, and preach peace where there is nowhere peace; but is it reasonable to pass by the great changes in locomotion by sea and land, which are bringing us nearer and nearer to the Old World, with its needs and armed forces, its greed of territory and insatiable ambitions? In another quarter of a century the map of Asia, as well as of Europe, may be changed, and unless faced by a federated Australia, which, though democratic and pacific, would be prepared to resist aggression, and to maintain its flag, the belligerents may find our protecting stretch of ocean bridgeable, and our people unarmid or unorganised. To prepare for such a contingency is not to dread it, but is to render
it incapable of occasioning dread. It is not to question the naval supremacy of the mother country, or its readiness to come to our aid, but it is to recognize the responsibility of every virile people to protect itself, if it were only to maintain its self-respect. Such prospects, and such a policy, are not popular in the ordinary sense of the term. The average elector and his representative alike prefer to discuss matters nearer home, move local, more parochial, promising early profit, presenting means and ends more closely related, and in which there is a smaller element of chance, and narrower opening for prophecy. It seems better even to sport with the Amaryllis of Irrigation, and with the tangles of State socialism, rather than look so far ahead and travel so far afield. And yet such issues must have their place in our vision, for in the event of the great catastrophe occurring, the local interests which we hold so dear, and the industrial democracy which is our first aim to preserve, might perish in a common wreck. It is in the interests of home that we should look abroad, and in the interests of peace that we should be prepared for war.

It should count for something in our mental development that in this youngest part of the world we are actually within hail of the oldest portions, and that almost within the shadow of its most absolute military despoticism our nation should be building up utopian democracies of the most pacific type. Cynics may profess to discern a likeness between them, or at least a kinship, but between what institutions or practices of humanity is there not some propinquity? What is there that exists which can give itself airs of exclusiveness, or proclaim its separateness from the universe of which it forms a part? That intellectual give and take which is everywhere a stimulus to thought should be especially quick and prolific between Australasia, or Southern Asia, and its northern continent. We are near enough to readily visit India and be visited. Its students might come to the universities of our milder climate, instead of facing the winters of Oxford, Paris, or Heidelberg. Our thinkers may yet become authorities upon questions which need personal acquaintance with India and its peoples.

It would be as idle to dwell upon forecasts of this order as it is foolish to discard them altogether. Until it be demonstrated that there is some reason why the nearest great country to us should be tabooed, its people, its products, and its destiny ignored, and all the flowing tides of its spiritual life and teaching excluded from those far-reaching currents which set us past its shores, and influence men across the whole circumference of our planet, we may hold it to be inevitable, as well as natural, that one of the first outward-going movements of our expansive Australian life will bring us into contact, and then into communion, with India. The fascination that it exercises upon our kindred will possibly be deepened for us, for the differences between our conditions and those of the East remain even greater than they were. Until we cease to feel the pulse-beat of human thought, and to move in accordance with the mental and moral unfolding of the race, we cannot refuse the attraction which the ancient wisdom of the Aryans exercises upon reflective persons; until we have ceased to feel the last faint touch of patriotism towards the islands in the Atlantic from which our fathers came, we cannot listen unthrilled and unfixed to the story of the heroism by which this superb dominion was won, and has been held in defiance of all adverse fortunes; until the last spark of romance has faded from materialized breasts, given over to the gospel of greed and selfishness, we must be moved by the marvelous panorama which history has unrolled across the Himalayan snows, and along the valleys of their mighty rivers. Beethoven's march in the Ruins of Athens suggests in sonnet just such barbaric splendour, fiery impetuosity, martial pomp, and rhythmic sweep of tribal movement, as are displayed in this romantic tale of conquest, conquest and revolt, the stirring and recurring cadence, incoming and outgoing like a tide, echoing in the ear long after the roar of drum and clang of cymbal have grandly and gradually died away.

"If I were to look over the whole world to find out the country most richly endowed with all the wealth, power, and beauty that nature can bestow—in some parts a very paradise on earth—I should point to India. If we were asked under what sky the human mind has most fully developed some of its choicest gifts, has most deeply pondered on the greatest problems of life, and has found solutions of some of them which well deserve the attention even of those who have studied Plato and Kant, I should point to India. And if I were to ask myself from what literature we, in Europe, who have been nurtured almost exclusively on the thoughts of Greeks and Romans, and of one Semitic race, the Jewish, may draw that corrective which is most wanted, in order to make our inner life more perfect, more comprehensive, more universal, in fact, more truly human . . . . again I should point to India."—Max Muller.

Though this glowing panegyric certainly needs qualification, it must be confessed that India is truly a land of wonders and wild extremes of the same surprising order as those depicted in the Arabian Nights—a country of contrasts and contradictions, of splendour and poverty, profusion and barrenness, vicissitude and adventure, voluptuousness and mortification of the flesh. The fires of a tropic sun kindle as well as wither, and the cup of life, recklessly filled to the brim of sensuous delectation, has been drained to its dregs of bitterness nowhere more deeply than in Hindu shades. Nowhere has the ascetic by protracted abstinence, ghastly penances, and frenzied self-mutilations, sought more ruthlessly to wring light and leading from his own suffering. Nowhere does the abundance of life in earth, air, and water, more amaze the sense and oppress the judgment; nowhere stagger millions of human beings under heavier burdens—some of the heaviest self-imposed. Nowhere is life more evidently the offspring and prophecy of death, for the land is marked with rains as the sky with stars, and the very villages are built upon the sites of scores of others, melted to dust under the feet—fallen one
after another like beads upon the rosary of time. By the hoary and weary age of India now stands the eager youth of these southern lands, beholding, as if in a magic mirror, its rapidly-passing throng of peoples, kingdoms, dynasties, and creeds, that have succeeded, and are still succeeding each other, in an apparently endless chain. There is matter for meditation here. To-day Australia is full of hope, as Asia of despair. Racially, socially, politically, and industrially, far asunder as the poles, their geographical situation, bringing them face to face, may yet bring them hand to hand, and mind to mind. They have much to teach each other.

CHAPTER 1.

THE BRITISH IN INDIA.

The story of Cortez in Mexico is more dramatically complete than that of Clive in Madras; the tale of Pizarro's ruthless robbery of the Incas more pitiful than the misinterpreted levy of Warren Hastings upon the Begums of Oudh; but undoubtedly the conquest of the Peninsula was originally accomplished in the same reckless and romantic manner, and sometimes by means as indefensible as were employed in America by the Spaniards. Without lingering upon its fascinating episodes let us glance at the present conditions under which the empire is maintained.

The traveller who anticipates that there are any outward and visible signs answering to the qualifying adjective "British," usually prefixed to the name of India, is wofully mistaken. There is nothing British in the aspect of the place, or its people; everything is Indian. The few white faces he sees now and then might be those of tourists like himself, and probably are. The cities, except in parts of a few capitals, the houses and streets, the residents, their garb, conveyances, habits, and language, the vegetation, the animal life, all are foreign to the English eye. The traveller has perhaps just left a P. and O. steamer, manned by Lascars, to find himself in a country in which his countrymen are far fewer in proportion to those they command than the white officers were on board ship. There are more Europeans in Egypt than in India, and as much evidence at present of British rule; that is to say, there are red-coated troops in its citadels, and English engineers upon its canals.

Those who wish to find the Saxon element in India must search for it. They will find it almost wholly beneath the surface. The population is as much an amalgam as the great image seen by the prophet Daniel in his vision, and the British is one of the least of its constituents. Our language is twenty-fourth on the list of spoken tongues. To say that the native races preponderate is not to sufficiently express their superiority in numbers, and the supremacy of their manner of life. India is Asiatic to the core, and all that is seen of it is Asiatic also. The British rule to a large extent by means of natives, and native organisations, or in the name and under cover of native authorities, and by native methods. Almost half India is still in courtesy treated as composed of independent states under native princes; but the evidences of English power are no more prominent in the Presidencies than in Hyderabad or Rajputana. The reign of law in the physical world is no more indicated to the casual glance of the unreflective than is the
British reign over India. Its white government is withdrawn for half the year into the distances of Olymian hills, and fulminates its decrees invisibly from among the clouds. In the cooler weather it apparently reveals itself only for purposes of pageantry.

As a matter of fact, the whole country is held in grip by a large army, which occupies all its strongholds and points of vantage, but is nowhere obtrusive of its presence. Order prevails in every province, and there is perfect safety for the unarmed throughout the length and breadth of the land. The one manifestation of British authority is the maintenance of just laws, and the firm suppression of all pillage and brigandage, except upon the part of guides, servants, and hotelkeepers. These may be regarded as licensed practitioners of the art on a peace footing, inheriting and cherishing the traditions of Timour, Nadir Shah, and a long succession of splendid robbers, whose practices are honoured daily by a most flattering fidelity of imitation. This assists in maintaining the local colour, which indeed is nowhere lost, however, when modified by the white regime. India is Indian in every aspect, and European in hardly any. It has no tincture of western morals, or manners, outside the suburbs of one or two seaports and cities of official importance. It lives as only the East lives, glows as only the East glows, especially smells as only the East smells; and remains to-day just as it was when first entered by Alexander, neither a civilised nor an Europeanised country, but "the cradle of the world and garden of the sun."

The conquest of this empire has been not inappropriately described as a miricle. Its retention is quite as marvellous. Both have been accomplished by means which seem so inadequate as to suggest some such supernatural guidance as the Hindus are always inclined to infer. The whites of India, all told, are as 1 to 2,000 of what may be termed the indigenous races. Deduct the soldiery— who are massed in certain garrisons and make little show outside the barracks—and there are nearly 4,000 dark-skinned residents for every Anglo-Saxon man, woman, or child. Even this figure does not convey the small degree to which Britons can be detected over the immense territory under their command. They are most of them concentrated in a few centres, and consequently there are large tracts in which one may pass days, among prosperous towns and innumerable busy villages, without meeting a compatriot. Even on the railways you may travel hundreds of miles without seeing a European, and in the country for days without hearing the English tongue. Enter a bank, a post-office, a Government department, or a great factory, and you will find but one or two whites, if any, surrounded by hundreds of Hindus. There are virtually no artisans or shopkeepers' employés but natives. Where an Englishman is employed it is as foreman or superintendent, and the number of these tends to diminish. On some railways native engine-drivers are continually being introduced; there are native magistrates, barristers, clergymen, contractors, bankers, and doctors everywhere; there are many more Asiatic soldiers in the British Indian army than there are Britons, and the same people constitute the great majority in the local bodies. In the whole country there are less than a thousand Europeans in trade, less than a thousand engaged in planting, less than a thousand who are professional men. There are many districts 1,200 or 1,500 square miles in extent, which contain two or three Caucasians, and some of these are only present periodically during the year. It is no wonder, then, that such a pitiful minority should be almost lost to sight amidst the scores of millions of alien races among whom they reside.

The residence of Englishmen in India is always intermittent, and always for a period only. All who can afford it spend their summer among the hills; almost all leave the country on long furlough every few years; none make their homes there, none settle, none marry with the women of the country. Every year comes a fresh influx of the young, hopeful, and healthy, and every year an equal number depart to end their days under a less withering sky. The ferocity of the climate conquers even the national customs of the Saxons, alters his food, his dress, his house, his habits, and his ideas. He either forswears many meats and drinks of the mother country, or pays heavy penalties until he does; protects himself with pith helmets and umbrellas, or is struck down in the heat, and dwell not in brick or stone, but in plastered halls of great height, without hangings, little furniture, and less decoration, in which every old world comfort is ruthlessly sacrificed, or replaced by others of an entirely foreign cast. He changes his hours of rising and sleeping, of eating and of exercise, his self-helpfulness and his social relations: he is probably separated from his infant children, and often from his wife, for years.

The sacrifice made in order to live is perhaps repaid in many individual cases by the achievement of brilliant successes which would have been impossible elsewhere. The pale, wasted women of the south may have lightened the burden of their husbands, even at the sacrifice of health and motherly joys. The tide of youth, ability, and courage, poured out every year upon these burning sands, too often to sink out of sight among them, has already reared many superb memorials to the masterfulness and might of the race. Yet life in Southern Asia is exile, and is only endured at best. It is but natural that at times Anglo-Indians should look back upon their choice with bitterness, echoing the cry of their poet—

What lured him to life in the tropic?
Did he venture for fame or for self?
Did he seek a career philanthropic?
Or simply to better himself?
But whate'er the temptation that brought him,
Whether pious, devout, or delus,
He is here for a price, than has bought him,
O Land of Regret.

The price of success in the peninsula is paid not simply in life but in opinion. Perhaps the greatest of all the transformations that may be noted in the Briton, who becomes an Anglo-Indian, is the change in his political ideals and principles. The disciple of
Bhutia maintains import duties with a protective incidence until Manchester interests prove too strong and still retains export duties on food products. The student of Herbert Spencer becomes an advocate of State railways and irrigation canals, and exhibits no repugnance to the creation of profitable monopolies. The supporter of Mr. Gladstone refuses the suffrage not only to all natives but to his own countrymen, and openly depreciates representative institutions. The cardinal doctrine of the laissez-faire school, that legislation is to be determined according to one set of dogmas in all times and under all conceivable circumstances, is infringed in every direction. Those who attack Irish Land Acts in the west, when they come to the east defend with zeal the traditions which make the State the sole landlord. In short the Government in Calcutta does daily and cheerfully all that it is forbidden to do in London, and does avowedly in the interest of the native races just what the parent Government is prevented from doing in the interests of white labour.

There are other contrasts equally suggestive. India is governed wholly from without, and there is practically nothing that even savours of self-government within its borders. What municipal institutions there are have little influence, and are not yet out of their teens. With the exception of a few picked men who have places in the Legislative Councils of the Presidencies, no native has any voice in any part of the government of his country. The white settlers are in precisely the same position. White and native alike are mere ciphers, or exercises only such illicit influence as is permitted to women in England and Australia. Power rests in the first instance with the Secretary of State, who acts chiefly upon the representations made to him by his officers in India, and a council of retired Anglo-Indians in London. His task is to decide in consultation with the English Cabinet upon the broad principles of policy to be followed, and to obtain their sanction either expressly or by implication from the House of Commons. That body devotes but a limited portion of its time to Indian questions, and contains but few men who understand them.

The real ruler of India is the Viceroy, who, if a strong man, like Clive, Hastings, Wellesley, Dalhousie, or Dufferin, can exercise an authority unknown in England or to Englishmen, greater than that of the Queen, and, within the law, not far short of that of the Czar. He has the advice of a council consisting of departmental heads to guide him if he chooses to accept it, but is in no way dependent upon its approval. He remains but for a few years, but, while the British Parliament allows him to reign, he is supreme. Madras, Bombay, the North-west provinces, and Bengal are ruled by Governors or Lieutenant-Governors, who are advised by councils, but they are subject in all important matters to their chief in Calcutta, who appoints to the latter offices. The two first Presidencies are filled by men from England, chosen for party reasons. The Punjab has a Lieutenant-Governor but no council, and Burmah has but a rudimentary administration as yet. Among

Indian officials seniority counts for something, though merit occasionally forces its way upward without it, but the "seniority and merit combined" which count for so much in our own public service, are not omnipotent there. The Government is personal a despotism tempered only by resolutions from the House of Commons. Public opinion, always weak in India, especially if against Cesar, is the only check upon its exercise. It is a check of the feeblest. The Government is autocratic in every respect; it is an exotic, it is native, always external to the country, always personal, and capable of unbridled abuse.

The actual administration seems much better than its constitution would lead one to expect. The exercise of favouritism is said to be on the whole decreasing, and now and then conspicuous capacity receives its need by this means. The service, whatever its faults, is unquestionably able and incorruptible, answering with unwavering loyalty to the demands of its chiefs. The Central Government in particular, and those of the Presidencies scarcely less, are actuated by excellent motives. The balance between native and white is not only held level, but there is an open leaning to the coloured side on many issues. There has been very high-handed and contestable treatment of independent States in past times, but for a long time an anxious and even painful solicitude to do them justice has been manifested at headquarters. The welfare of subject races has been the aim in recent years of much careful legislation, of enormous expenditure, and of indefatigable activity on the part of the autocratic rulers, and of those who execute their behests. Canal engineers complain that they are not supported when treating for land with villagers, or in their efforts to protect their works from trespassers, and that unfair royalties are levied upon them for the benefit of native states. So tender is the solicitude of these at the head of affairs, for ryot and rajah, that the irrigation enterprise is weighted with payments and privileges, rather than there should be any doubt of the justice of the Government. The aim of the State is to do for the Hindu what he will not or cannot do for himself, and its régime is therefore in every sense of the term paternal. It even spares the rod to such an extent as to run the risk of spoiling its step-child. The net result is a benevolent tyranny, leaving a little towards unnecessary officiousness. The tyrant has not been content to offer what he believed to be advantages, but sometimes has gone so far as to thrust them upon his subjects. This, however, was rare, and is becoming rarer. The Government is now convinced that India cannot be British in its conditions, and will never be British except in rule and principle. It has to be accepted as Asiatic, and governed on Asiatic lines. We found a despotism, and we preserve it, striving not to alter or weaken it, but to make it sympathetic and just.

Hampered to some extent by its overseas responsibilities, the Government remains martial, not merely because of the necessity of dominating the peninsula, but in order to protect it against ex-
tional aggression. The increase in its revenues during the years 1885-86 to 1888-89 amounted altogether to £7,000,000, and yet the expenditure kept pace with it to such an extent that the last year only showed a surplus of £37,000. From 1887-88 to 1890-91 the net revenue, excluding opium, salt, and provincial rates, advanced by £1,260,000, but in the same time the increase of the military budget alone swallowed up a larger sum. It is true that the security afforded is as much to the Hindu taxpayers as to the white officials. It is true that the peace enjoyed throughout the whole country, and which could not be enjoyed without a white supremacy, is worth more than is paid for it; but the burden remains to prevent the more liberal treatment of proposals for fresh canals. A military Government is never the most sympathetic, and where that Government is composed of men of another race, speaking another tongue, and shaped by another civilisation, it is not to be expected that it should look too sympathetically upon the foibles of the dark-skinned races over whom it reigns. The study of native literature, languages, and customs has done much of late to qualify the civil servant for his task, but without personal interest in his work, and feeling for the helpless thousands committed to his charge, these cannot go far. The wonder is that they go so far.

Bureaucracy was defined by Balzac as "a gigantic power set in motion by dwarfs," creating "a power of inertia" in the "Report" of officials, of whom he says, "No one comes or stays in the Government offices but illers, incapables, or fools." Bureaucracy is as paramount in India as in France or Russia; the "Report" reigns without a rival, and the inevitable evils of administration by documents therefore appear on every hand. Red-tape is king, and Sealing-wax is high priest. But the members of the public service are by no means the despisables created by the French novelist, or more lightly satisified by Dickens. They are, as a rule, picked men, clever, well-trained, conscientious, and energetic. Their defects appear to be rather in sympathy than in spirit, and in manners more than in character. The nature of their surroundings, their privileged position, and their Asiatic clientele, combine very naturally to develop the self-contented class feeling, and hauteur of some of those occupying subordinate posts. The chiefs are almost invariably men of tact and politeness, but those who serve under them are, or imagine themselves, among whites, what Brahmins are among Hindus; they have the consciousness of being "twice born," of wearing an invisible "sacred thread," and of looking down from a lofty height upon the resident or stranger who is not of their caste. Hence the story of the child of an official who, bearing in mind the parental attitude towards them, asked its mother if "uncovenanted" civil servants could ever attain salvation. There is an absurd order of precedence which puts the "griffin," or as we should say "new chum," who arrived yesterday to take his stool in a Government department, before the professional men of eminence, or merchant of standing who have grown grey in the country. Officialdom is nowhere more rampant than in India, but at the same time it must be confessed that nowhere is itabler, more upright, or more polite to the visitor.

Private enterprise scarcely exists in India. There is a prosperous commerce, and there are certain speculative investments such as mining and planting, which are in European hands, but the total of these is inconsiderable, and their sphere strictly limited. The production and business of the country as a whole are in native hands, and are carried on in native fashion. The great public works have been executed by Government, or are rapidly passing into its control. There was an epoch when the advantages of encouraging the investment of British capital in India were officially recognised, and when steps were taken to invite it. The State went so far as to guarantee a certain interest upon sums expended in approved enterprises. Many of the greatest railways in the country were constructed on this plan. The same desire for the introduction of European activity still exists, but there is a change of opinion as to the method to be adopted. It is found that when the State gives a guarantee it constitutes itself a partner in an undertaking of which it has to bear all the risks without receiving a fair share of the profits. The same principle has been applied to irrigation works, and with no better success. Consequently the capital and the business, as well as the authority of the country, are, after the Oriental fashion, in the Government itself.

The problems involved in railway construction and management are most of them peculiar to the country, and demand no lengthy criticism in this connection. There are nearly 5,000 miles built and owned by the State, nearly 7,000 miles built by the State and worked by private companies, upwards of 3,000 miles built and worked by guaranteed companies and 200 miles by assisted companies, besides over 1,000 miles in native states. The capital invested is upwards of £200,000,000, yielding with subsidiary steamboat services a net return of 5 per cent. It suffices to say that the accommodation afforded to white passengers is, on the whole, admirable, and the value of the lines commercially, or from a military point of view, inestimable.

The direct interferences of the House of Commons of late years have been, as befits so great a Chamber, few but important. The abolition of the duties which gave a slight protection to the cotton-mills of Bombay was accomplished in India itself by Lord Lytton, to some extent under the influence of Manchester merchants, who remarked the growth of the local competition with undisguised alarm. Doubtless the Viceroy believed that he was acting in the interest of the country over which he ruled, but assuredly the English importer who encouraged him was actuated solely by trade selfishness. The blow was felt by the new industry, but the disparity in wages remained so great between the two countries that it sustained the shock, and adapted itself to its new circumstances. Fine fabrics and patterned goods, formerly made by hand in the country, are imported from England in immense quantities.
but the common and coarser materials are manufactured by steam machinery in India, and are steadily gaining a market there, in China, and in the further east. The great mills, which are the real rivals of Manchester, are a good property, paying their owners from 15 per cent. to 20 per cent. upon their capital; have white workers at high wages, and hosts of native workpeople.

The British manufacturer has once more taken alarm at their progress, and has called attention to the long hours of labour, employment of women, age of children, and sanitary condition of Indian mills. His interested motive may be partly excused in the excellences of the reform achieved. A commission was accordingly appointed in India, which has taken much evidence, and recommended legislation of a moderate character, to regulate hours, and holidays, and provide for women and children. It is safe to say that this will not prevent the growth of the industries of this description, and at the same time that it will not come a day too soon. The mills visited by me were at Ahmedabad, employing 1,000 persons, the women at 12s. a month, and the males, from boys at 8s., to adults at 20s., a month. They contained 600 looms, and 43,000 spindles, kept in full work by camel loads of cotton brought direct from the growers. The hours worked were from 12 in winter to 13 or 14 in summer. The cheapness of production under such conditions is in some degree balanced by the circumstance that an English mill-hand does the work of at least four natives. They suggested as much by their demeanour, standing before their looms, all but naked, like so many cattle, cheery and chattering, fairly attentive, but rather careless and stupid—a class of human animals who are yet likely to play a part in the fortunes of that section of the world which always buys in the cheapest markets. Similar factories are being erected in China. Other trades will follow. The manufacturers of the future will require to take Asia into account.

A House of Commons resolution condemned the liquor legislation of the Indian Empire two years ago, provoking an elaborate rejoinder from the Government, which discounted most of the statements upon which Parliament was moved. It is, nevertheless, admitted that the restrictions of the Muhammadan law, and of certain castes, have been of the highest value to the Hindus, who like all other races with whom the whites are brought in contact, appear to suffer severely if permitted the free use of our familiar forms of alcohol. The import duties on spirits have been increased, and taxation imposed on malt liquors brewed in the country. In Bengal the outstill system has been abolished, and in the Madras Presidency 7,000 liquor shops were closed in 1889-90, but the risk of permitting the traffic to develop as it has done of late years is indisputable, and the number of drinking houses in Calcutta and Bombay tells its own tale. There should be no difficulty in suppressing them, with gain to the community and ultimate gain to the revenue as well.

The Commons resolution condemnatory of the opium trade has the same moral arguments in its favour, though the consequences of indulgence fall upon another people. "It is historically false, although frequently asserted," says Sir John Strachey, "that we have made war with China with the object of forcing our opium upon her against her will," and he emphatically declares that in this respect Great Britain has no responsibility. He quotes the statements of Chinese Ministers made in 1851 to Sir Thomas Wade, to the effect that the "habit was too confirmed to be stopped by official intervention," and that "opium will be procured either from India or elsewhere." The growth of opium in Western China is steadily increasing, and a good deal of the Celestial zeal against Indian imports may be suspected to be promoted in the interests of the local producer. Nevertheless, it is an abominable traffic to be carried on by Government sanction; and though the £8,000,000 a year profit which it yields to the Treasury comes out of Chinese pockets, and goes into the Indian exchequer, it is clear that the moral sense of the English will not permit a continuance of the trade. It may be noted in passing that the patriots of the Congress lent no support to the demand for the cessation of this most profitable monopoly, which very largely adds to the prosperity of the North-west provinces and the independent states of the same latitude.

The local English press maintains the reputation which belongs to the journals of the mother country and her colonies. It is partisan, of course, but is conducted with great ability. The majority of the newspapers are in sympathy with the Government. Those which assume the rôle of critics and lean to native views, exhibit less talent, but contain delicious passages of Hindu-English composition. There is nothing in any of them approaching the local news to which Anglo-Saxons are accustomed in their own countries. Of the vernacular organs the stranger is unable to speak.

What the British Government has accomplished in the way of irrigation cannot be appreciated, unless the enormous difficulties under which it has been accomplished are understood. How far the Government may be able to complete its projects for the material development of the country depends upon its future history, and if this would be told even for a prophet to attempt to forecast. Strong and successful by reason of the ability and character of its masters, like all other Asiatic Governments, it exhibits a certain instability. This is increased in any ordinary degree by the fact that the white officials, who come by training to understand the needs of the country, are not free to shape its course according to local conditions. The Hindu races, castes, and States are subject to the active overrule of a people alien in blood, spirit, and purpose, living in another climate, in another continent, and practically in another age. It must always be difficult to maintain a despotism within a democracy; the methods and principles of the one are bound to conflict with those of the other. It may be assumed that the House of Commons will always contain a majority ignorant of Indian affairs, and viewing them, at 6,000 miles distance, under mistaken preconceptions. A similar difficulty presented itself at Rome under the
Aurungzeb was an unsatisfactory protection against foreign invasion, a very incomplete security against corrupt officialdom at home, little in the shape of public works, and very indifferent to the expectations of those adopted in the seven-hilled city and its environs. There has never been the same misgovernment of India as there was of Roman provinces, but there has been, and is still, a necessary subordination of the conquered country, and a suppression of its individuality, which, though abundantly beneficial to its inhabitants on the whole, renders their relations to Great Britain irksome, and affords a constant opportunity to those whose advantage lies in promoting misunderstanding. There is plenty of room for mistrust. The country has been won by the sword, and is held by the sword; its Government is imposed upon the people by force, and is administered by foreigners, upon a policy independent of their interests, far more enlightened than theirs, but nevertheless to them strange, uncomprehended, and unacceptable.

What would happen if the best Hindus were endowed with control of the treasury, or a place at the council table of the provincial governor; it is too early to inquire. The probabilities are that irrigation schemes would be pushed on, while the military budget would be cut down, and the incidence of taxation varied; but the contingency is not yet near enough to render its present consideration essential. The movement to secure a measure of representation for the natives is now in its seventh year, the sixth congress sitting during the time of my visit. Judging it by the men who took a leading part in its proceedings, it is influential and strong. It must be admitted by the most captious that the speeches made by its chiefs were worthy of being uttered from any platform in the mother country, or indeed, in the House of Commons itself. The English employed was not merely correct, but apt, and at times choice; the style was clear and strong, the logical construction complete, and the periods often eloquent. There was nothing except the names to tell the reader that the addresses proceeded from the mouths of men who were not of British blood. Whether or not they represent only a study of good models, and the repetition of borrowed ideas, as their antagonists maintain, it is quite certain that they attain more success than the equally studied and equally in-cried utterances of most public speakers. It would be hard to say that originality of manner and matter were to be required, in addition to oratorical power, as a qualification for the suffrage, without excluding most of the electors of the British Isles. Such a “counsel of perfection” could not be seriously upheld by practical men, and it is preposterous to maintain that the ability displayed at the congress is not of itself a sufficient evidence of fitness not only to create, but to compose a representative body.

The question raised, however, is not so simply solved. Because there are a handful of brilliant speakers, advocates by profession, who are capable of leading and inspiring gatherings of 1,000 or 2,000 men, selected out of a population of 289,000,000, it is not proved that there ought to be any sudden change in the Government of this dependent empire. The requests of the congress party are moderate, being limited to a plea for additions to the existing legislative councils, raising the provincial to bodies of between 36 to 48 members, and the central to from 40 to 60 members. There are already nominee natives in all the councils, but it is proposed that the new men should be elected, the constituency, according to Mr. Bradlaugh’s last Bill, to be chosen by the Government, and not to include less than 2 per cent. of the adult males. How the line is to be drawn which shall shut out 98 per cent., what tests of fitness can be applied when it is character as well as intellect which needs to be weighed in the balance, and how election machinery can be adapted to the Oriental mind and manners, are problems which may well puzzle any Ministry in London.

The congress party confess their own inability to face such issues when they seek to impose them upon the very administration which they denounce as unsatisfactory. They realise the dangers arising from strongly-marked differences of race, creed, and principle among themselves, but, though these have endured for ages, trust somewhat irrationally to time, to speedily dispose of them. They seek by alterations in the courts, and the introduction of juries, to put greater judicial power into Hindu hands, ignoring the circumstance that the natives themselves prefer British advocates and judges whenever they can obtain them; ask for reform of the police, which is only possible by reforming the morals of their own countrymen; for native military colleges when it is becoming each year more difficult to fill the ranks of the native army with soldierly men; for the right of natives to carry arms, which would in many cases be employed against each other; for reductions of taxation, and increases of expenditure upon education and in other ways. None of the objects acknowledged by the congress are undesirable, and indeed all of them represent ideals towards which progress should be sought. The exclusion of Hindus and Muhammadans of ability from the legislative councils is a less to both the natives and the British; the public services needs to be brought into closer sympathy with the masses. The white non-official population of the country have a right to be heard in public affairs, and to be better recognised; the judiciary and executive require to be severer; the offensiveness of bruiting needs to be checked, and the support of the native peoples enlisted on the British side. It would be presumptuous for a mere tourist to pronounce upon the best means of attaining these ends, but the thoughtful Radical must admit, that election and representation are not necessarily the only, or best, means of securing them, among the half-savage races who go towards making up the Indian Empire.

Sir William Hunter, in his invaluable encyclopaedic work upon the Indian empire, enters at length into the question of the relative cost of the Mughal and British empires to the people of the country. What the Hindu got for his contribution under Aurungzeb was an unsatisfactory protection against foreign invasion, a very incomplete security against corrupt officialdom at home, little in the shape of public works, and very indifferent
The British in India.

Finally, then, the British Government of India is a compound of contradictions, for, while practically absolute in authority and vested in two or three men entirely, it is supposed by many to be controlled by a popular assembly; military in spirit, it is bureaucratic in method, and pacific in end; conservative in practice, it adapts many radical principles; and, committed wholly at first, and often still, to the energy, judgment, and initiative of individuals, has created for them a complete system of written regulations embracing the whole field of possible activity. No public service is so enslaved by the pen, and yet even the civil members of it may be said to live in the shadow of the sword. Separated by immense distances which forbid frequent personal association, all business is conducted by correspondence; the affairs of the country, from the most momentous foreign relations to the pettiest details, being set out upon papers which are passed from hand to hand. It is a Government of minutes based upon memos. Even its soldiers command in the attitude in which Boehm has placed the great governor of the Punjab in his bronze statue at Lahore, sword in one hand and quill in the other. It would be hard indeed to say which has now the mightiest influence on its administration. While the soldier, like Henry Lawrence, has often done the most distinguished work in times of peace, the civilian, like John Lawrence, has come forward as a warrior in the hour of need to save an empire tottering under a stab in the back from the treacherous hand of mutiny.

British India, in short, is British neither in race, religion, language, policy, sentiment, nor aspiration. Garrisoned by a few Britons, and governed by still fewer, it not only retains its Asiatic complexion, but impresses its character to a large extent upon its conquerors. The British in India have themselves ceased to be British in many respects. They have developed castes and curious creeds, walk with troops of retainers, live like Persian satraps or Roman proconsuls, coming at last to think and speak in the phrase of the Orient, and with its vivid colouring. It is they who have adapted themselves to the Hindu, and not the Hindu who has taken their imprint. It was not to strengthen her hold upon her British subjects that the time-honoured title of the Queen was altered to that of Empress of India. Bearing in mind how few are the whites in proportion to the hordes of varied hue who swarm from Cape Comorin to the Himalayas, and the extent to which they have required to stoop to the conditions of life in the tropics in order to conquer, it is not too much to say that the first fact requiring to be fixed in the mind of the inquirer is, that India to-day is altogether Asiatic in the spirit and form of its life and institutions, and British only in flag, in name, and in name.
CHAPTER II.

THE NATIVE POPULATION.

The importance, and indeed the all-importance, in any study of Indian affairs, of an accurate knowledge of the native population, has already been suggested in the preceding chapter. It has been incidentally indicated, at the same time, how many stocks are more or less imperfectly blended among its enormous masses.

It is true that there is a certain apparent unity in the life of the inhabitants occasioned by the sameness of the dress assumed by British administration; its far-stretching railways; its ubiquitous officials; its tens of thousands of white soldiers; its common currency and all-embracing law; but the surface only is affected, and beneath this semblance of universal likeness the original differences between race and race, caste and caste, creed and creed, or district and district, remain chief factors of the situation. What may be true of one or some of these is not true of others. The peoples are conservative of their varying characteristics, and carefully maintain many of them. Each province presents its immemorial observances, its ancient forms of belief and ways of life, and its sacred traditional practices. The consequence is a condition of things difficult for the stranger to conceive. He finds in this territory "all the oldest religions, all the oldest customs, petrified; no form of popular government yet possible. Everything which Europe, and still more the New World, has outlived, still flourishing in full vigour: superstition, fanaticism, polygamy, the most primitive priesthood, the most primitive despotism." There is manifestly little unity to be anticipated amongst such inheritances as these.

The very fact of the British possession of India testifies to the native diversities. It is hard to see what natural tie could bind such peoples and their Anglo-Saxon rulers since, as Professor Sedley says, there is between them neither community of blood, nor community of religion, nor community of interest—except so much as there must be between all trading countries. In a sense these ties are also wanting between the various sections of the coloured population, and, indeed, it is due to the radical differences between them that the British control was established and is maintained. The bulk of the inhabitants have for centuries obeyed alien masters, and are less embittered against the white invader than against some of their neighbours who are now subject to the same authority. Almost every native state has fallen by the swords of native soldiers, though of course these were taught and officered by Englishmen, and supported by comparatively small bodies of English troops. Neither the conquest, nor the mutiny, nor the reign of peace since has as yet created any other unity in "India" than that of British rule.

If they are regarded attentively three distinct groups of races can be distinguished, although the great bulk of the population now consists of a mixed people, composed of a blending of the three. The first group is that of the original non-Aryan inhabitants, mainly found as scattered tribes in outlying and inaccessible retreats. They are by no means of one status or language. Some of these are still, and many were until recently, in a condition of barbarism not much superior to that of the Australian aborigines. But the tribes of the forest and hill are of a higher type, make spirited soldiers, and exhibit fine martial virtues. All of these are believed to have reached India from the north-east, but the greatest people of this group, the Dravidas, came from the north-west, preceding the invasion of the Arians from the same quarter, and maintaining friendly relations with them when they did come. Southern India is to-day peopled by 20,000,000 Dravidas, speaking Dravidian tongues, and possessing a literature and architecture of high merit. They have been Brahmanised in religion to a great extent, as have most of the earlier non-Aryan group, but in their turn have greatly influenced the development of ancient Vedism into modern Hinduism. The next group of races comprises the lighter-coloured Turks, Afghans, and Maghuls, who entered the country after the Arians as Muhammadan invaders. By their energy and courage they retained political mastery of the north and east of the peninsula for several centuries. The Arians who entered the Punjab between the influx of these two groups were a people of a higher rank. As the inheritors of the Sanskrit language and literature, and as poets, metaphysicians, mathematicians, or statesmen, they have been, and are, the intellectual leaders of the peoples of India. They are chiefly represented by the Brahman caste, which has imposed its authority in the most absolute manner upon all but the Hindus, and out of the very various materials within reach has created by compound the complex Hindu religion of the present day, and the social organisation belonging to it. The Arians and Muhammadans, though small minorities, have always been, and still remain, the mainspring of the intellectual and political life of the peninsula; they are the descendants of its most masterful Asiatic invaders, the inheritors of the Vedas and the Koran.

It is unnecessary to trace these distinctions further. Strictly speaking, only a proportion of the 280,000,000 people of India belong to the blood of races known as Hindu; but they are the greater proportion, and the name is convenient for referring to the whole body of the dark-skinned residents. It is true that they are divided into innumerable castes and sects among themselves, but all their differences, though great, are minor beside the broad contrast between the whole of them and their European masters. Taking the native races in the gross in this relation, they exhibit certain general characteristics, which can be professed without
serious inaccuracy of the Hindus as a people. They are British subjects, citizens of the same empire as ourselves, and are already allied to us by commercial ties which should strengthen and multiply as years roll on. It is necessary in our own interest that we should seek to understand them, and it will be impossible to convey a clear idea of the irrigation of India unless the nature of its people is allowed for. The whole of the State's customers upon its great irrigation schemes are Hindus, and hence Hindu methods and Hindu characteristics confront the enquirer every turn. These must be noted to some extent, no matter how rudimentary and imperfect the sketch may be.

In every country there is a minority which enjoys more of the good things of life, more opportunities of culture, more leisure, power, and influence than the majority. This minority in India is remarkable for its smallness. It is but a fraction of the whole. The country has produced many great statesmen, warriors, poets, and philosophers in the past, and possesses a certain number of able, high-minded, and well-educated Hindus, holding high and responsible positions today, but such men are far less numerous than they would be among an European people, and the gulf between them and the masses of their countrymen is greater. They are units out of millions. Rajahs, who are worthy of their position, professional men who compete with whites in their own field, or men of taste and learning, who add a western breadth of enlightenment to Oriental depth and intensity, may be left out of the question for the present. It is not of these, but of the millions, that one can generalise. Further, in glancing at them and at their modes of life, it is necessary to abandon all preconceptions and associations bred from European experience, and to realise that everything in India, from the ground upwards, is essentially foreign to its character and appearance, although described by familiar words.

To begin with the towns, which have in some few instances public buildings of great magnificence, such as it is impossible not to note, there is, after all, a great monotony in the appearance of their private quarters, and after the first few have been well scanned there are no surprises for the traveller. To be transported in an instant, as in an Arabian Nights story, into the bye-lanes or blind alleys of any one of them, would be utterly confusing to any tourist. There are characteristic features, it is true, especially in the chief places and great structures, where there are way. Ahmedabad, Ajmere, Allahabad, Patna, or Poona, though not so famous or unique as the great capitals, have distinguishing traits of their own, which are readily discernible. Their situations differ, their people differ, and their customs differ. But their back streets and buildings do not so noticeably contrast as would enable even an Anglo-Indian to say which it was that he had been supernaturally waited to. There are divergences between the Tamil towns, and those of the Marathas or Rajputs, but these are not great: the type is essentially the same, and to have seen one native city thoroughly, so far as their modern native quarters are concerned, is practically to have seen them all. The type displays a network of narrow and crooked lanes without footpaths, bordered by square, flat-roofed sparsely-windowed houses, and their tiny courts filled with nude children and lean animals, the whole having an air of untidiness, squalor, and discomfort. As for the villages in the same tract, they are entirely indistinguishable, and, indeed, throughout the whole empire are built upon exactly the same model, with the thatched one- or two-roomed adobe hut for its almost invariable unit. The materials vary, and the style of structures in minor particulars, as the people do in their dress, in their tints, and in their cost of countenance, but this does not alter the fact that all are brown, more or less nude, of allied and intermingled race, living in the same class of houses, and in towns whose swarming tenements and dirty ways bear a striking resemblance in all the Presidencies.

Something may be learned by looking at the people and marking what their exterior tells of disposition and capacity; but at the outset, it must be remembered that half of one sex is invisible. Only women of the lower castes, except those who belong to a separate people like the Parsees, are ever to be seen. Whether Brahmanists or Muhammadans, they live under lock and key, and are not permitted beyond the exclusion of the Zanana walls in disguise. When they venture abroad, and this is rarely, they do so under almost as many restrictions as lepers. Those who are compelled to go on foot appear under a long white exstinguisher, which hides the face, form, dress, age, and all but the height of the wearer. Two small lattice apertures allow them to look out upon the street sufficiently to pick their way, and that is all. Women of the better class are driven in little bullock gigs, with tent coverings, in which there are but two small slits. These require to be opened before they can be looked through by the occupant, and thus the tips of their fingers alone appear in the daylight. We happened, in one native state, to meet a raja about to travel with his wife. She had been brought to the station in his closed carriage, transferred to the waiting-room by a private way, and carried thence to the train in a curtained palki, the side of which was placed against the door of a compartment, with its blinds drawn. A large piece of drapery was then held up from one to the other, so as to cover her exit and entrance, without the possibility of even the attendants beholding her. This feat was finally accomplished with so much elaborate caution as if a dangerous wild beast had been transferred from cage to cage. Yet this noble space as a man of the world, and paid an English governess a high salary to give a western education to the spouse whom he shrouded from every eye with such Oriental precaution.

Under conditions like these it is evident that the opinions expressed must relate only to those women who can be seen, and with the exception of Parsees, these all belong to the poorest classes.

There is an infinite variety in the complexion, physique, and garb of the Hindus. The first glimpse of the country afforded to the voyager from Ceylon discloses the pagoda of Trichinopoly, standing
up from the shore upon a rocky height, dominating the landscape—
as the faith of which it is a shrine dominates the life and habits of
the whole south. The first of its sons to approach are Tamils, who
come out in their cargo boats to the ships, lying four miles off
the dangerous and surf-beaten shore. Dark-skinned, and with but a
handkerchief costume, these picked men have the muscle and
pale of athletes. Unloading a vessel in their own fashion they
offer a subject full of vigour and character which might have delighted
Michael Angelo. Southerners, as a rule, especially the
males, have supple figures, and keep them well on view. Towards
Central India both sexes are smaller, though with an air of greater
energy. In the Punjab men are taller, more sinewy, and more
dashing in their style. The black-bearded Sikhs have a warrior's
stride; the Afghan's Jewish caste of countenance supports the
popular theory of his origin, while the Central Asian, and those
from the north-western frontier, exhibit rude and savage traits, and
if from the north-east a Mongolian cast of countenance. In the
west, the skin has usually a sunburned tint, and peasants are often:
all but black. Many Muhammadans are of yellow tinge, the fat
and sleek Bengali baboo is somewhat darker, while the high caste
Brahmans are usually of a light red brown. All Muhammadans,
and no Hindu civilians, wear whiskers; a moustache is common to
both. The head is often tonsured, shaving as well as tooth-cleaning
being a religious duty in all castes.

Children are almost invariably pretty in all parts. Among the
adults there is naturally a great diversity of feature, though not
more than may be noted in any miscellaneous Anglo-Saxon gather-
ing—good figures are not uncommon and good faces not rare. The
soul of Socrates shone behind the face of a Sileus, and it is of
course possible that the straight nose, high arched forehead, well
shaped head, and poetic lips of the best Hindus may sometimes
conceal a character as inauspicious as that of Nana Sahib. It is, at all
events, something in their favour that a fair number even of the
poorer classes have a distinctly well-born air and pleasant counten-
cances. Barefooted and untrimmed by clothing, their gait is freer
and finer than that of Europeans, while the carriage of the
women, extremely graceful, owing to the universal practice of
balancing water wares upon the head, would put to shame the lady
pedestrians of civilised lands.

Dress is largely a matter of climate and season everywhere, and
its chief varieties in India are due to the same causes. There is
little anywhere on which a distinction between underclothing and
outerclothing could be made. The working attire of males in warm
weather represents the irrefutable minimum of decency, though,
such as it is, the rag is always rigorously preserved. The girdle
of the man becomes a girdle cloth with the woman. In parts of the
south it may be said of both sexes that they wear but little here
below, nor wear that little long. In addition, the lady always
possesses within reach a piece of cotton drapery, which serves as
head-dress, veil, cloak, and skirt, in turn or all at once. Further

north the Hindu women adopt the petticoat, while their Sikh and
Muhammadan sisters appear in what, according to Dean Stanley, is
the only ecclesiastical vestment recognised by the early fathers—
that is, trousers. These are of cotton, made tight below the knee
and loose above, just like those of the men in these regions. Upper
garments become more plentiful towards the Himalayas. Cash-
merian or Sikh peasants are warmly clad and thickly turbaned,
while horse-dealers from Afghanistan add as an overall a rough,
undressed sheep-skin coat. Children up to three or five years old
are often perfectly nude, and sometimes boys of nearly twice that
age, but nowhere is there any intentional indiscency on the part of
man or woman. Hats and boots are unknown, many of the poor
going always bareheaded. Caps and turbans are the general
covering, the latter assuming many shapes and hues. Slippers are
generally worn in the north and in Calcutta, but stockings are very
rare, although silver-plated toes and ankles are not. Gloves are
undreamt of, even by the dandies—for there are dandies of all
degrees of tawdriness, exhibiting just the same harmless littleness
as if they walked Collis Street, Melbourne, or Pitt Street, Sydney,
every day. It is doubtful if there is a handkerchief to be found in
the lands of an unofficial native between Peshawar and Cape
Comorin.

The clothing of the Central Asian is intended to be warm, and
dirt is generally an appreciable element in its thickness, but on the
whole the dress of the peoples of India is not only drees intended
to its lights, but fairly clean considering their surroundings.
Many rejoice in spotless white linen, and the rich are gorgeous on
State occasions in velvets and plumes, while gold and silver emb-
roideries wander over their attire from their slippers to their turbans.
Rajahs and nobles are often loaded with jewels. Parsi ladies appear
in brocaded veils, or in ample flowing robes of extremely gay line, and
their male relatives indulge in such remarkable combinations as
salmon-coloured veils, with blue silk breeches. King Solomon in
all his glory was not arrayed like one of these; while for a parallel
to the brightness and variety of dress among a bevy of Parsi
women, one must turn to the old Scriptural prints in which the
apostles appeared like a troop of Josephs, in robes, whose many and
violently contrasted colours, evinced a profound indifference to the
esthetic harmonies, and neutral tints, of which the moderns are
enamoured. A taste for decided effects in costume discovers itself in
all races and in all classes—bright red skirts and blue upper gar-
ments, or a purple turban, a yellow jacket, white waistcoat, and
the green snails being sometimes united in one dazzling whole.
The result is naturally extremely striking; decided colours harmonise
well with dark skins, and are always charming in the mass.

Woman has been cynically defined as "an animal that loves
finery," and so far as the definition is true, it is true of the sex.
White women themselves are not more devoted to personal decora-
tion than brown. Certainly, except the lady who makes "music
wherever she goes," there can have been none more addicted to
jewellery. The Hindu woman, whether princess or peasant, walks
embellished, as much as metal and stone can embellish the human
form. She takes advantage of her bare feet to place rings upon
every toe, of her short skirts to carry a set of anklets, of her open
dress to exhibit necklaces and pendants, of the absence of sleeves
to display bracelets and armlets, and invariably disfigures her face
with a nose-ring, or nose-brace, and earrings in profusion as well.
Among the wealthy there are fanciful ornaments in the hair, which
is long and carefully dressed, resplendent zones, and innumerable
baubles of a minor kind. It is rare to find one lady taking advan-
tage of all these adornments at once, but they are to be seen
occasionally. In some cases the arm from wrist to elbow is almost
covered with variagated bangles of silver, gold, coral, bone, and
other materials; there are several more above the elbow, while six
or eight anklets about each foot keep up that tinkling which roused
the wrath of the prophet Isaiah against certain daughters of
Jerusalem.

The nose comes in for very sad treatment everywhere, the less
offensive being the fitting of neat pearl stars in one or both nostrils,
but there are in some districts solid nose-rings of the size of small
watchers, and others, lighter and finer, so large in circumference
that they fall below the chin, and can be rested upon the crown of
the forehead. The owner probably eats through them, and can
almost pass her head through them. It is said that the natives do
not kiss, and certainly one would judge so from their reckless habit
of putting obstacles in the way. Now and then the nose-ring is
drawn a little aside by a light chain or thread fastened to the ear.
That organ, however, is even more deformed and has greater
burdens to bear, the lobe being sometimes, as in South Sea women,
dragged right down to the shoulder by the weight of more than a
handful of trinkets and fringes. It is fortunate that there are
no more opportunities of distortion and mutilation afforded by the
human shape. A dowry largely takes the shape of jewellery, and
the custom leads from time to time to murders of which robbery is
the motive. This knowledge appears to exercise so deterring
influence, for even the poorest woman who is picking up droppings
on the road, or carrying bricks for wages, has her bangles, her
anklets, and her nose-ring of silver, if not of gold. Before reading
a homily to them it is advisable to recollect how far the same
savage practice obtains in our own country. Those white women
who are fond of appearing in full undress might note that even the
Changas or gypsies and other low caste women, though not com-
pletely apprised, are careful in every case to have a covering for
their breasts, and that no Hindu woman under any circumstances
wears false hair.

In giving currency to even a passing judgment upon manners
and morals, it is, of course, essential to speak with the greatest
diffidence. It is with servants and people of that class that all
whites come most in contact. Strangers meet no others. Hence
the denunciations frequently unjustifiably hurled at the whole
population. Those who wait upon Europeans and work for them
are always relatively low in caste, low in morals, and low in self-
respect. Their tendency to lie is said to be universal, and de-
tection awakens no shame; the tendency to bribe and be bribed is
also said to be universal, and even two or three native judges were
about to be tried on charges of that nature at the time I was in
India.

The almost incurable tendency to corruption of the lower castes,
who act as police, messengers, or minor officials, assists to make
the Government hated. The Hindus themselves complain bitterly
of the bribery, favoritism, and blackmail practised by them, and
from the testimony personally given to the writer it was clear
that they had good cause for their reproach. A magistrate con-
fessed that in cases between natives his practice was to ignore
the evidence or oath tendered by both sides, and determine
the cause on the probabilities, by intuition. A railway engineer
declared that nine-tenths of the complaints upon which he
adjudicated were either partially or wholly false. A pretended
crime is sometimes dramatically rehearsed by men, who then pro-
ced to perjure themselves with the utmost circumspection, in
pursuance of a private vendetta. The police themselves are
notorious for their venality and tyranny. Every native railway
station-master must be tipped before he despatches the ryot's grain,
and when famine prices reign the douceurs necessary to obtain
tracks rise proportionately. The mill licences on the Hori Doab
canal, though sold by public auction, are bought by a ring at their
own figure, and afterwards distributed among the accomplices.
The timber floated down the Sirhind was not only purchased by
native rings, but resold at their own private auctions the same day,
and the profits divided among the operators. Culpity, cunning,
and lying go hand-in-hand among the lower castes to such an ex-
tent that the task of the white officials everywhere is trebled, while
they are always certain that much undetected duplicity is proceed-
ing around them. To a small extent some white officials and some
high native officers are said to be guilty of peculation and the accept-
ance of presents, but this is rare, and it is the low code of morality
among the mass of small clerical and police officials which becomes
in the mass a serious incubus upon the whole Government.

The social structure unmortarized, as Mr. Stevenson would say, by
these laxities, is rendered still and inflexible by superstitions of
many kinds, childish, gross, and cruel. These impede progress
seriously, and in every direction.

The boldest and most important action of the British Government
in this regard was that which put down "sati," or widow burning,
and human sacrifice. When the Brahman informed Napier that
these rites could not be prevented, and were essential to their
religion, the gallant general bluntly replied that he did not doubt it,
but his religion made it equally obligatory on him to hang anyone
who indulged in such pious exercises. A quiet but persistent
struggle has been maintained with more or less success against the
insanitary practices and dangerous superstitions of the various tribes, but the cause of social reform has been so bitterly resisted, especially by that most talkative, most sanguine, and most cowardly class, the Bengali babus, that little progress has been made. The National Congress does not touch subjects of this character, though the bulk of its members form a social congress which sits by side with it, and openly favours interference by legislation with many native customs. During my visit the raising of the age of consent of child-brides was a burning question, the whole of pious Hindudom being deeply agitated by a proposition to prohibit the consumption of marriage until the age of twelve, unless womanhood had been attained earlier. No proposal to tax the unhappy ryot, or to destroy such liberties as he enjoys, could have excited the fierce antagonism provoked by a restriction of this nature, aimed only at the grossly inhuman practices of Brahmanic and their wealthy clients. Fortunately it has been imposed by the British Government, and will prove, it is to be hoped, but the first of a series of measures striking at the barities of native life and custom, which have been fostered by their demoralising beliefs.

It is not to be assumed that their superstitions or social system are imposed upon the Hindus merely by Brahmanic ascendancy, for, whether by long habit or the turn of their intelligence, these appear to have become inherent. New castes are being created at the present day among the men employed upon the railways, and in other pursuits incidental to modern life. These are no doubt maintained to a considerable extent by the fact that they are often trades unions of a strict type, and of marked efficiency, relying upon strikes and boycotting long before they obtained European precedents for the use of those weapons. But apart from any such advantages, the tendency to group isolation appears to be persistent, though the artificial nature of many of the conditions imposed is a bar to industrial progress. For instance, the well-diggers of Madras will not associate or intermarry with tank-diggers, the Sikhs will not grow indigo, nor betel tobacco. Their superstitions are also obstructive. Villagers have their rain-makers, in whom they trust, though the more sceptical and speculative residents of the towns prefer to visit their booksellers who register bets upon the showers. The recent riots in Benares arose because a sacred site was utilised for the city water supply. Irrigation, like every other national enterprise, suffers by absurd local observances. So far there is no sign of any Hindu appreciation of the marvels accomplished almost against the native will. In the season of drought the canals fail, their duty to the thirsty plains and their tired cultivators, carrying the saving gage of water scores and scores of miles under a blazing sun, and spreading it over thousands of arid acres, to clothe them with harvests, and fill their people with plenty. Human capacity cannot claim a more humane achievement, its gains won, not by strife with man, or to the loss of any living thing, its gifts drawn from the superabundance of the mountain, and saved from swelling the over-abundance of the sea. Yet caste rules do not consider it, and no divine revelation is recorded, although much needed, for the improvement of native implements and engineering.

In perception quick, in reason slow, in conscience weak, and in matters of practice affected by faith obstinate, suspicious, and sullen, the average low caste man, in his every day life, is almost always an idle, shiftless, and careless creature, noiseless, doleful, good-humoured, and servile. He does one thing and one thing only, but he will not do it well, and the brigade which the Anglo-Indian maintains are far from able to secure to him the comforts of a European household. Native servants are as cheap to keep as a cat or dog so far as bed and board are concerned, but the number of their petty thefts, small commissions, breakages, and blunders help to make up a fair total at the end of the year. Their temper is placid, and even when the famous master denominates one of them the "son of a pig" he salutes to the earth with the soothing and unctuous reminder, "You are my father and my mother."

Their treatment by their masters has improved and is improving, though it is not so very long ago since the attitude of some whites to their domestics partook of a good deal of severity:

Old Colonel Thunder used to say, "And fetch his bachelor's head a whack, That if they'd let him have his way, He'd murder every mortal black."  
In fact, throughout our whole dominion,  
No honest neger could be got,  
And never would, in his opinion,  
Until we polished off the lot.

Fidelity, affection, and loyalty are not uncommon in family servants who remain in the same employ for many years, and there is evidently a better observance of the moral law among more responsible public officers, as also between the Hindus themselves, though to analyse and estimate these several relations would be a difficult task.

It is sufficient for the present to say that the average morality of the masses is not high, and that it rises in some degree above that of the towns in country districts, though nowhere has it reached a Caucasian standard. There are, of course, compensating virtues which might be taken into account, but that such balancing leads to nothing. Compared with the European, the Hindu is obsequious and servile. He is always deferential to the white, and his politeness is so engrained that it is exhibited even after he becomes a post-office or railway official. His respect is indicated in a rather odd manner, from our point of view, since he is careful always to enter the presence of a superior with his head covered and his feet bare. As a rule shorter and always slighter than the Briton, he eats little, and that little chiefly grain, fruit and sweetmeats—

"Keeping the barking stomach wisely quiet,  
Less with a neat than useful diet."

He is far less carnivorous even when not wholly vegetarian, and
more abstemious than the white even if not a total abstainer. Muhammadans and upper-class Hindus are forbidden to take alcohol, though the former smoke tobacco excessively, and occasionally opium and other compounds. Many low-class Hindus drink and smoke whenever and whatever they can. More contented than the Caucasian, less energetic, less aspiring, less independent by far, the Hindu is an even greater slave to those secular social customs which acquire by prescription a kind of sanctity even with a great part of the English nation. The Hindu clerk or peasant will, because it is considered the proper thing to do, betroth his infant daughter to a man past middle age, and celebrate the event by a festivity, to conduct which he takes six weeks’ holiday, and to pay for which he borrows as much as he can at 60 per cent. interest. Funereal ceremonies are equally lavish. Extravagances of this kind are so getting that they turn thousands of small proprietors into serfs, or keep them in a condition of miserable impoverishment for years. They have produced such disastrous general results that the Government is now considering the form of a law which shall contain stringent provisions against usury. It is almost impossible to free the people from such self-imposed sacrifices.

The natives are children in their love of jewellery and display, in their thriftlessness and thoughtlessness, their humours and their credulity, and as children they require to be protected. On the other hand it must be remembered that many qualities are not wanting in some races whose warriors have done yeoman service to the Empire upon hard-fought fields. The better qualities of the other sex are present, too, as witness the retiring and modest demeanour everywhere of the women of all classes who are visible, their quiet dignity of manner and their unaffected tenderness to their little ones. Such touchcs make manifest the kinship under all differences between the British in India and the multitudinous throngs who have become in truth their adopted children.

To appreciate the economic value of Hindu labour, two or three peculiarities require to be remembered. In India there are for all practical purposes neither clocks nor calendars. Time is the essence of every contract. It is to the native mind a thing immeasurable and of no value. The will of Allah is that the white man should be always in a hurry, always impatient, always demanding that the thing to be done be accomplished according to the direction of the watch which he carries in his pocket, or of the ghulam which he hangs upon his wall. Such is the mania of the white man, one which it is well to humour by promises, but which no one having his case and pleasure to consider will trouble to obey after the pledge is given and peace temporarily secured. The native knows that there will be a storm somewhere in the indefinite region of the “to come,” but that is far off. Moreover, the Salib having said his say must submit, and the wisdom of ignoring his instructions will be manifest if he be induced to offer a fresh premium for the speedy conclusion of the long-owed task. Time is money in Europe, but in India it is only false coinage. It is worth so little to the Hindu that he cannot conceive its importance to anyone else. To him to-morrow is a long way off, and next year may never come. His sentiments on this subject appear to prevail on branch railways, and certainly govern his itineraries on all lines. The conception of a time-table appears to be altogether beyond Hindu comprehension. Natives arrive at their starting-point at random, camping contentedly in the great stations of the south, which they transform into caravanserais, or picnicking outside them by the hour, or by the day, until the next train appears and carries them off, packed like sheep in trucks on market-day.

Space, like time, has a different standard to the native. Carlyle considered it impossible to make even a shoeshed entirely happy, but it is clear that he had a white and not a brown skin in his eye. For instance, in real estate, what would not begin to satisfy the Caucasian is boundless wealth among the Hindus—one of whom will live with wife and family in a den no larger than an old “bush” chimney, and without a hundredth part of its light or air, will carry on a considerable business out of doors on a surface as big as a paving stone, including sitting accommodation for himself, or, if a household proprietor, displays his wares in a kind of hollow box stood on end, or a masonry cell of the same dimensions, which in Australia could be used for nothing better than a kitchen cupboard. The peasant will make a living for himself and those dependent upon him on a piece of ground about the size of a milking-yard, or if it be unirrigated on about a acre and a-half to three acres in the south. Yet there is land in many parts of India where it only needs moisture or a little knowledge to bring under the plough thousands of acres of fair quality now lying idle. As the cultivator requires so small a plot, there is still a large margin for the multiplication of his class, and of their productiveness. Meanwhile the population crowds into limited areas, where every inch is occupied, and in bad seasons the little donkeys, resembling Mexican burros, appear to have nothing to crop but their own shadows. In towns the people subsist upon incredibly small wages, and in the country, on the average, no more than is just sufficient to keep soul and body together from day to day. Their condition is one of permanent and apparently irremediable poverty. Of course most of them are unable to make any provision for the future, but then they have little or no desire to make if they could. Nothing is put by for a rainy day, or, to be more accurate, for days when it does not rain. When they come continuously the harvest fails, and the people simply starve by tens of thousands, as sheep do in the interior of Australia. The ryot dies as easily and as uncomplainingly as the sheep, and leaves as little warning behind him among his kith and kin.

To the reflective such a state of things appears appalling. The Government has made immense efforts already to prevent these catastrophes, which have been attended with a large measure of success, but still the knowledge of the risk run by the peasant makes his lot appear gloomy even to Anglo-Indians. Rudyard
IRRICATED INDIA.

Kipling has painted it in a splendid parody of the chorus in Swinburne’s Atalanta in Calydon—

His speech is of mortgaged bedding.
On his knee he borrows yet,
At his heart is his daughter’s wedding,
In his eyes foreknowledge of debt.

He eats and hath indigestion,
He toils and he may not stop,
His life is a long drawn question
Between a crop and a crop.

But, as a matter of fact, the picture is misleading. It is the Englishman who has indigestion and foreknowledge; the native understands neither of these things—his mortgage is forgotten, he will enjoy his daughter’s marriage feast as much as any guest—and if his next crop should fail, he will accept the decree of his deities and die without a sense of any special injustice or harsh treatment. Have not millions died before in the same manner, and what is man that he should resist the stroke of Siva? Those who survive will learn nothing from such experience. They will borrow and spend as before, and as before produce cheaply and cheerfully on the very edge of famine, just as they will go on drinking from a stagnant pool while fever or cholera is scattering death in every household. Such ignorance and indifference almost put courage to the blush.

Conduct of this kind contributes to render the Hindu as much a riddle to the Caucasian as the white evidently is to the native critic who speaks much of his plentiful spare time in speculating upon his master’s inexplicable love of punctuality, truthfulness and labour. Of course if the natives would speak their minds it would be much easier to cultivate a mutual sympathy and understanding, but simple as this seems, it is almost impossible. There is the greatest difficulty in persuading them to express their honest opinions. In spite of persistent efforts, the Hindus have still to be studied from the outside, although the inside view would be much more valuable. Almost insurmountable obstacles require to be surmounted before even the Anglo-Saxon resident of long standing can comprehend them. Oriental secretiveness has passed into a proverb. The Sphinx itself does not present a more enigmatic countenance than does the Hindu, of whatever class he may be, to the questioner who seeks to discern his mind upon any matter of moment. His most familiar form of concealment is by unconditional agreement with the interroga-tor, so as to offer him merely a reflection of his own opinion. This pleases most and reveals least. The effort to read the trend of a European’s wishes or ideas before replying to his queries is amusingly apparent in many instances. When this cannot be done ignorance is pleaded or command of English lost, or else an answer is given in vague generalities. It rarely happens that without prompting or knowledge of his interlocutor’s mind the native discloses his own. Now and then by the exercise of tact and patience something of his genuine self can be learned. Having, though a mere tourist, once or twice obtained an evidently frank statement of individual views, the testimony thus given appears worthy of record. What Europeans think of the Hindus we know, but we have yet to learn what Hindus think of us and of themselves.

My first success was with a Brahman, a wearer of the sacred thread, engaged as a railway clerk, speaking English fluently, and whose liberal tendencies were indicated by the very fact that he was taking his son, an interesting and handsome lad, to see the wonders of Jaipur. Natives travel a great deal for religious festivals, for pleasure, or for business purposes, but rarely as tourists or with a view to any educational result. What this Brahman felt most keenly was that the poverty of himself and his compatriots prevented them from improving their status or their minds by travel or education, as they must do to attain a European level. The university fees which he was required to pay for his boy were a heavy burden upon his slender salary, and he earnestly desired their reduction. A cheap English story, having a Turkish hero, and a yellow-backed novel by a third rate author, together with a book in the native tongue, lay beside them in their second-class compartment, and it was plain that father and son were both, as far as their knowledge and means permitted, acquainting themselves with literature. The father was an eager critic of passing political and social events, and showed that the records of the British press and the criticisms of morals and manners which appear in its columns are noted as evidences of the fact that their rulers accord each other of much the same failings in their own country as are denounced in the native in India.

Politically, he was a warm supporter of the demands of the Native Congress for the introduction of representative institutions throughout India, but was prepared to accept the boon by degrees. After earnestly enquiring into the powers of self-government enjoyed by Australians, he remarked with a sigh that it would probably be a century before his countrymen would be fit to enjoy such privileges. That they would hereafter be enabled to exercise the fullest rights of the franchise and maintain responsible government he had no doubt, his assumption being that what was good for the white man must be equally good in time for the brown. The power was coveted, and so also was the equality with the white, which its possession would ultimately secure. The Home Rule struggle in Ireland was anxiously watched by him, and by those who aspired with him to a similar policy for India. He quoted triumphantly the confessions of leading politicians, that classes of vote-qualitied in Great Britain had not always enjoyed the franchise, but nevertheless had finally received it. Not every Briton who now possesses a vote could be alleged, said he, to be as wise, just, interested, and patriotic as he ought to be. It was, therefore, only a matter of degree of qualification as between the London or county elector, and the Hindu who ought to become an elector when he had attained the same standard. But for the poverty of his people he seemed inclined to think that the qualification required might soon be gained by them.
His attitude on religious questions was also liberal, but a shade more conservative than in politics. He admitted the unsatisfactory condition of the popular faith, and looked forward to great changes in it, not to any conversion from it to other creeds, but to its gradual development into a higher form. When pressed as to particular predictions and differences, he asked, with some sharpness, whether Christians have no sects which oppose each other, while they nevertheless maintain their unity in faith. On the worship of idols he was even more sensitive. Men must have idols; if you destroyed one they would take to another, and again turning the tables, enquired, "Have Christians no idols? Have Catholics no saints and no images?" He referred to the Paris with some little bitterness as men who, breaking their own habits, had only adopted those of the Europeans which are least worthy of imitation, and condemned the Brahmo Somaj innovations in the same strain as deficient in patriotic and national feeling. It was natural that as a Brahman he should be strongly opposed to any great or rapid innovations in Hindu belief, and therefore too sudden a reformation. He dismissed at once any suggestion that it could be cajoled or seduced, but declared himself willing to aid in purifying it, and removing its superstitions from time to time. What we wanted, said he, is not profession of a creed, old or new, we want practice: our religion teaches us to do good, let us practise that first, and then we can consider doctrinal questions one by one as they arise. Once more he concluded with a question, "Do Christians practise all they preach? Are they all perfectly virtuous? Must not they develop also?"

In social relations he was an ardent supporter of reform, desiring the abolition of infant marriages, and the establishment of a new order of domestic life and female culture, though still insisting that progress must be slow and partial. He confessed with a little regret that the caste system was being steadily sapped, and particularly added, with a certain sadness in his resignation, that the privileges of his own order in which they had entrenched themselves for centuries, and by means of which they had made themselves absolute masters of the lives and minds of the people, were being slowly, though insensibly, dissolved. In Bombay the goldsmiths and bankers were already selecting men of their own order to officiate as their priests, and other castes would probably follow their example. Under the British law the Brahman had no redress against such usurpations, and was obliged to tamely submit to see his functions exercised by men not born but elected to the office. Let this procedure spread sufficiently, and the caste system as a whole would eventually be destroyed. Personally, he would not resist this transformation if it were carried out without removing altogether restraints that were necessary for the proper performance of their duties by those released from the old form of obligation. At present he lamented the fact that those who ignored caste and hereditary faith were adopting no other law in their stead, but simply taking advantage of apostasy to indulge in licence and debauchery, without any guiding principle.

But for his faculty of putting awkward questions of the kind with which Friday baffled the prepossessing zeal of Robinson Crusoe, the Brahman was an agreeable conversationalist. His position was entirely liberal, but he deprecated hasty attempts at change, taking into account at every step the conservative habits and temperaments of his people. He was a reformer who trusted to transformation from within, not adopting the ungenerous independence which refuses assistance from without. But, on the contrary, expressly courted it Europeans, he said, differ much among themselves; not all are wise, not all are good, not all care for the native; there was an evident bitterness in some of his recollections of their treatment of his race, but he hastened to add, with warmth, "It is upon the good and great Europeans that we must depend for our elevation. They must lead us; we have no leaders as yet, and we cannot accomplish our enfranchisement of ourselves alone."

A wealthy Muhammadan landowner, in the North-west, who was possibly a native magistrate also, and on that ground perhaps biased by Government influences, adopted a different attitude altogether. Not more intellectual nor more refined than the Brahman, his manner exhibited far greater force of will, desire to command, and consciousness of personal authority. Unchecked exactly in our fashion and with good manners, he did not forget that he belonged to a ruling race, which, although still in a minority, would certainly seize the reins of power if they ever fell from European hands. Schools, he said, were established in his district only when he was a young man, and therefore his English was a little laboured, but he quoted Saadi in Persian, and was evidently a thoughtful and well-informed man. He spoke of the Congress movement with some impatience. The mass of the people could not be entrusted with the franchise, and if they were would probably seek to take advantage of the minority. He looked forward to the higher education of the followers of Islam, and appeared to regard their future with confidence. Perfectly polite, he was less deferential than the Brahman, and it was evident he regarded himself as the superior of any Hindu, if not as the equal of the Caucasian. Eager for information and quick of apprehension, he had a decided set of opinions on all questions, and summed up the dangers of concessions to the Congress party by quoting a pithy Oriental proverb, "Teach your servant the bow and he will soon point his arrows at you."

The most interesting chat, however, was with a Banya of Bengal, a member of the caste hereditarily devoted to banking, money-lending, and similar business. His position was that of an employee, and he entered the carriage only because having arrived at the last moment, after the window had closed, the station master had refused to sell him a third-class ticket. As he was hastening home because of his wife's sudden illness, he had no alternative but to pay the extra sum, though he could ill afford it. Probably he, too, was a supporter of the Congress, but at this time his mind was running more upon the social and economic aspects of his situation. "What can we do?" he asked: "we are too
I believe in God, but He is far up, high, and man is far down, low, and we need someone to come between us. Some ask Siva, I ask Vishnu. The Brahma Smaj have given up too much. They are too European; they believe only in the far-off one—God. We believe in Him, too; but we do not neglect the gods that are nearer. Vishnu is full of love. We need someone to love us, who will stoop to us and help us."

It was my mission to listen, with as little comment as possible, so as not to check the flow of speech, and consequently I passed by the fact that I had seen no Bengali intoxicated, and that there had been landlords, in Ireland, Scotland and elsewhere who had failed to realise their duty to their tenants, and only referred to the likeness between his view of the necessity for a mediator or intermediary and that of Christianity. The man was thoroughly in earnest, and asked no questions, a very unusual thing with natives, who are always consumed with curiosity, and almost impertinent in their desire to satisfy it. He was speaking from the fullness of his heart, gratified at finding a European listener, and without the slightest knowledge that what he said would ever reach any other ear. He had a refined face, lit up with zeal, a very plain but clean robe, and an imperfect command of English, but he became eloquent when he learned he was speaking to an Australian, and exclaimed, "Tell the people far away, tell them that we—the masses—in India are poor, are ignorant, are wretched beyond all conception of theirs, and that we need all their wisdom and their assistance to lift us up, to give us courage, and enable us to live as we ought to live and be what we ought to be. We need teaching and help—much teaching and great help." Above the noisy rattle of the train rose the eager voice, and under the dim light of the lamp shone the gleaming eye, as possessed by a profound sense of the poverty and weakness of his countrymen, and of the wealth and strength of the white, he uttered his despairing wail.

Whether our race would achieve much if situated as the Hindus are, living in abject poverty of possession, education, freedom, and opportunity, is a difficult theoretical question. What our race can do to elevate these subject millions, and improve their opportunities, is a practical problem pressing for answer, which must be answered speedily, but to which no answer, at once satisfactory and complete, has yet been discovered. Nor can it be said that we are as well qualified to reply to it or as well equipped for remedying it as the sad-eyed Banyan believed. We have our own poor, we have our own ignorance, we have our own inequalities of society and inequalities of its conditions. We have obligations at home to add to our obligations abroad. Parting from us with the refined politeness and courtesy of the east, our native friend slipped out of the carriage into the night at the next station to seek his hut and his sick wife.

It would not have heartened him to learn that, too, had our grave issues to face and grievous problems to solve, to which his came as a serious addition.

The native life of India is mainly rural, and to convey a concep-
tion of its character and conditions it is necessary to take the testimony of those who have lived it for many years.

General statements are far less impressive and suggestive than the detailed descriptions of particular districts which, however differing among themselves, are much more faithfully illustrative on the whole of the true condition of the country. The zeal and capacity which are brought to the dry duties of administration have occasionally found scope for themselves in literary or scientific work, and the Punjab has been happy in the acquisition of two complete studies of its local conditions, that in the west made by Mr. Purser, and that in the east by Mr. Ibbetson. The report of the latter, both as being the more recent and as more generally typical of the conditions of the peninsula as a whole, may be advantageously noted. The subjects involved in any criticism of India and its people are so great and the issues involved so many that it is only by special instances that their problems can be indicated, and their solution vaguely outlined or implied.

Mr. Ibbetson's district was situated to the north of Delhi, close to the Jumna, and partially under its western canal; its chief towns, Karnal, containing 23,000 inhabitants, and Panipat, of historic fame, housing 25,000 among its ruins. The tract contained nearly 900 square miles, of which 400 were cultivated, 300 pasturage, and the balance barren, maintaining in 1881 about 320 villages and 26,000 people. The whole of it was alluvial still loam, in the hollows called dikes, sand in old river beds or wind banks named blow, and a mixture of the two termed canals, all being deposited by the Jumna as it worked eastward through the ages. A low-lying tract, having a sandy soil and water close to the surface, extends from the present stream to a ten feet rise, which marks its utmost flood limits; it is irrigated chiefly by wells, half of it being under the plough, and 80 per cent. of its cultivation irrigated. Above the bank runs a level slope with a stiff friable soil, half of it farmed and three-parts of the cultivation watered by means of a canal. Beyond this again is a higher table-land of grassy plains, intersected by belts of trees and jungle, with only a fourth of it under cultivation, and that dependent upon a rainfall, declining from 28 inches near the river to 18 inches and less in this part, which is chiefly devoted to pasture. In the low-lying land the wells are but a few feet deep, but in the plateau water is not found except at 90 feet or greater depths. The intermediate slope is rich in mangroves, and the river bottoms in date palms and luxuriant groves of trees. At Karnal, there were the finest orchards in Northern India, and there are still throughout this tract many valuable shrubs and natural foods.

From the earliest times the chief events of Hindu history have transpired within this district, or near it, in the city of Delhi, whose varying fortunes it has always shared. It is representative of the Punjab, especially because made the thoroughfare of invasion, the three great and decisive battles of Panipat being fought within its borders. It suffered from these even more than the western territory, and recovered less quickly under British rule. The early Emperors bore heavily upon its resources, because of its nearness to their palaces; but at least they benefited it by means of canals and ruled it with some degree of consistency. After the overthrow of the Mughal throne it became a no man's land, wasted by Mahbuts and Sikhs alternately, until four-fifths of it relapsed into forest; the few villages that remained were fortified strong-holds of predatory bands at war with each other and levying blackmail upon all strangers. The fields were given over to beasts of prey, lions being seen in the vicinity as late as 1827, while tigers seized on fakirs on the main road. Wolves, bears, deer, crocodiles, and wild fowl, still abound in the outlying parts, but when the territory came under the British flag in 1809 they bade fair to be the sole proprietors.

Peace brought back the peasants, but unpardonable misrule by early officials rendered the unfortunate district almost as wretched as in time of war. English rule has not always been beneficent. The taxation was not only excessive, but vexatiously imposed, with the most reckless ignorance and injustice. Every petty chief was permitted to levy transit dues, in addition to the regular custom charges; the police were notoriously corrupt, bandits flourished, the irrigation was so mismanaged as to ruin thousands of acres, while the hapless white magistrate in charge traversed the district carrying all his criminals with him, since gool he had none. The country once more became loping into barbarism, the villagers, though as much attached to their homesteads as any people in the world, fled from their ancestral shrines before the blundering exactions of incapable officialdom. The famine of 1824 first opened the eyes of the authorities to the consequences of their tyrannous stupidity. The assessments were revised, and in 1833 again largely reduced. In 1836 old debts were remitted, and in 1843 a regular settlement was effected, which, however inequitable, was an immense improvement upon the former condition of things. In 1847, 1852, and 1856, there were fresh efforts to adjust the burden to the needs of those who were compelled to bear it, and finally it fell to Mr. Ibbetson in 1876-81 to introduce a scientific system under which it was possible for the unhappy residents at last to realise that a civilized Government not only aims at justice, but abides as well as enforces its commands.

Of the people, 207,000 are Hindus and 35,000 Mahommedans. Until after the mutiny the latter worshipped with their neighbours, and paid a certain homage to their shrines. The Rajputs raise cattle on the plateau, while the Jats universally, with some few bodies of Gujars, Rors, Tagas, and Sayids, apply themselves to cultivation in the lower lands. Individual proprietorship of land was unknown among them until the British régime was introduced, and they were equally ignorant of rent. A number of the villages are still worked and all are governed on the communal principle; in some the land is divided among the several classes of villagers, while in others the titles of individuals are recognised in a limited degree, relating originally to the use rather than the
ownership of the lands. The misfortune is that here, as elsewhere, instead of developing existing systems for the benefit of the cultivator, the rage for landlordism has led to the blind introduction of the principles of English law, with the most disastrous effect in many cases. The whole polity of the daily life of the Hindus is based upon other lines; the villages are communal in all their habits, and are self-governed entirely in a communal spirit. Hospitality is a duty; food, tobacco, and a rest house are provided in each of them for travellers and officials; they have commonage and its rents; repair their wells and public buildings, such as they are, maintain their local watchmen, and undertake many civic duties. These expenses are made up out of common revenues and common contributions, which are said to be arranged with perfect equity. Agriculture in the same way depends upon association: among the people, whether for ploughing, sowing, irrigating, or reaping, and it is their intelligent co-operation alone that makes it possible for them to succeed as they do. Then, again, there are tradesmen, such as carpenters, cobblers, blacksmiths, potters, and others, who work for all in the village and supply their needs by the exercise of their respective crafts, receiving in return certain fixed proportions of the harvest. The taxes in Karnal and neighbourhood are still paid in kind, and services in cultivation are reckoned in kind, so that the profit sharing and social organisation which form the ideal of some political thinkers, are to be found, just as is land nationalisation, not merely in the germ, but in a considerable state of development among our fellow-subjects in India. A wise conservation would have respected these native institutions and customs, and have sought to encourage their natural evolution and improvement. Unfortunately it was preferred to hamper and main them, and to thrust upon the peasants so far as possible the harsher and more selfish practices of a commercial people infiltrated with individualism, and having for their ideal of action buying in the cheapest and selling in the dearest markets, without regard to those who bought and sold, and who were bought and who were sold in consequence. The careful redistribution of taxation, realignment of the canal, and construction of public works have now brought the tract to a better condition than it has ever enjoyed. If there is nothing like individual advance or local developments such as are familiar in Anglo-Saxon communities, it has to be remembered that the increase of population is always up to the limit of subsistence, that nothing more than subsistence is aimed at by the mass, and that nothing more is possible to individual aspirants, if there are any such. All are reduced to a level at which practically the whole time and the whole strength of each man are needed to gain his bare bread from day to day. The Indian peasant lives in a mud hut, but without owning the land upon which it stands, and sees the building collapse in time under the rains, since he can build another upon the same spot, with material obtained from the village tank. By this means tanks are increased in size, and villages elevated higher upon their mounds every year, and in some old sites have actually risen 100 feet. The peasant owns the stools of earth and metal necessary for cooking—the latter of brass if he is a Hindu, or of copper if he is a Muhammadan, a few strips of cloth for dress, a few rupees hoarded up for a wedding, and the rest of his small capital visible to the world in his wife's little stock of jewellery. He does not, as a rule, own the land upon which he labours, and the wooden implements by which he scratches it represent a very few shillings. He owns nothing more unless it be an ox or two. His hours of labour are from daylight to dark, with a short rest in midday at the summer heat. His food is grain and pulse soaked in water or boiled in milk, or porridge of coarse grain, a paste-pudding, or boiled rice. The women of his family cook, spin, clean cotton of its seed, grind corn, fetch water, and sometimes work in the field. Children are employed as soon as they are able to tend sheep or cattle, or scare birds. All work and always work, and for very little reward.

In Mr. Ibbetson's district, though perfectly willing to purify themselves for a friend if they believed he had had on his side, and though always prepared to cheat and deceive the white, if not the stranger of their own colour, they are honest in their dealings among themselves, and, so far as he knew, moral also. Life offers them few pleasures; their simple festivals, their little harvests, and their eternal gossip sufficing from year to year. A modest people religiously, they believe themselves too small to attract the attention of the great gods, and accordingly confine their worship to the sun, the Jumna, mother earth, and the god of the home, propitiating fairies and demons, and especially the deities of small-pox and kindred complaints, while carrying with them everywhere a crowd of idle superstitions. Nothing is done without religious sanction—well-sinking, ploughing, or harvesting, are all ushered in by brief and business-like petitions to the unseen powers. The peasants give nothing for nothing, nor even prayers. Working at the well-mouth is recognised as dangerous, and consequently becomes a proper occasion for piety. Hence the natives' proverb, with its showed worldly wisdom of summary:—"It is a mad world. People call on God only at the well, and twist their bullocks' tails and prosper." There is a certain method in their madness, even in their cruder and most childish beliefs about ghosts, omens, charms, horoscopes, lucky numbers, the evil eye, the danger of yawning, and the mischievousness of sneezing. They manage to sail as near to the wind of admonition, and as close to the costs of pardoning, as other Pharisees in more civilised communities, minimising self-denial, and cajoling angry deities by judicious bribes to their priests, from whom they obtain a considerable latitude of self-indulgence. By such familiar compromises with reason and conscience one is enabled to discern the relationship of the Hindus to peoples with whiter complexions. They are the touches of nature which make the whole world kin, linking the quiet, submissive, silly-minded Oriental to his Caucasian master, whose brusque manners and
laughing prepotency of command might seem at times to create a suspicion that he believed himself a being of another order.

As are the people of the Punjab so are the people of the whole peninsula constituting the base and body of its social pyramid, of which only the apex and surface are coated with a thin facing of conventional civilization. They constitute the entity to which we refer as "India"; all the magnificence of its mountains, sweep of illimitable plains, flow of superb rivers, and dazzling glory of irresistible sun, furnishing only a background for the bulk of savage life and patient labour. Towns count for little, and the townsman, noisy as it is, for less, in the sum of the nation's existence. The village and the villager is its real units, and more, perhaps, than in any part of the world the peasant is the typical citizen—the conservative substratum upon which all rests—in whose breast the wild creeds, intense caste feeling, and unprogressive character of the race stand revealed in all their pristine and ever-enduring power. His narrowness, sectarian prejudices, and confidently iliterate ignorance are balanced by homely virtues and gentlenesses, which his chiefs exhibit in a less marked degree. Playing no part in public affairs, furnishing a small proportion only of the ruling class, subject to strange masters and always the serfs and creatures of those of their own blood who may happen to be in power, the yeds have preserved healthier qualities and nobler traits than their wealthy aristocracies or reigning families. Their lot is the lot in most countries—unceasing toil, unnoted pleasures, unrequitted sufferings, and unrecorded aspirations. History ignores them, tradition discards them, poetry disdainfully pass them by. And still to have innocently helped to feed their fellows may yet be held more honourable than to have wasted farms or sacked cities; to have reaped the harvest of the seasons, better than to have sown ambition and garnered pride or fame. "We may talk what we please of lilies, and lions rampant, and spread eagles in fields fair or dargent, but if heraldry were guided by reason, a plough in a field arable would be the most noble and ancient arms."

Of the warlike races it is unnecessary to speak, since they have been reduced to the same pastoral life as their fellows, unless enlisted by a Rajah among his medley retainers: or they have taken the ruppes and dunned the uniforms of the Queen. The whole country depends upon its agriculture, and that again in many parts depends upon irrigation. Where the farming relies upon rainfalls there are frequent failures of the crops, and these failures involve hardships and calamities which exhibit a side of the Hindu character already alluded to, but which needs emphasis in this connection. There are parts of the unirrigated interior where the crops very rarely fail, but the black shadow of famine does occasionally touch them, and often lies deep and dark upon the rest. The picture then presented is one of the saddest that ever meets the eye. The passiveness with which the gaunt and wasted villagers meet their death lends it an additional horror. The very resignation of their demeanour appeals to all the energies of the European, and often, alas, appeals in vain. Conscious innocence, or conscious guilt, might bow as meekly before the stroke of justice, but the Hindu perishes without moral revolt without challenge of destiny, and even without asking the reason why.

This reminds us that the most striking circumstance in relation to the native population is its magnitude. In parts of Bengal it is denser than anywhere in the world, and over the greater part of the long settled country far exceeds the European ratio. The main purpose of this book is to sketch the superb systems of water supply, by means of which many millions maintain existence upon tracts that without it would only support a fraction of their number. At this stage it is but just to indicate that there is a point of view from which the great schemes appear less admirable in their net results.

As the real mission of irrigation in India is to maintain life, and its success lies in minimising famine, it brings those who would sum up the case for and against it fairly face to face with an old problem of history, pertaining in some degree to all races, but especially under Asiatic conditions. Progress in numbers is readily measured, and at each census the totals of the Indian Empire are enlarged. In 1881 Lower Burmah had 3,670,000 souls, in 1891 it had 4,450,000, or an increase of 21 per cent. It is true that this is partly due to immigration from India proper; but there too, the totals have expanded. The prospect of a country doubling its population in five or ten years may appear at first sight matter for congratulation. It means peace and plenty, to some extent health and morality, increased production, increased consumption, increased trade, and increased wealth. All these can be predicted of India, whose total population for British and feudatory States alike was 236,000,000 in 1881, and was 286,000,000 in 1891. In the same period Australia has added 1,009,000 as against this 50,000,000; and though the latter total has been swollen by annexation and improved methods of enumeration, the broad fact remains that the gain in 10 years exceeds the population of Italy or Prussia. Among the most potent means of this rapid growth in the population is unquestionably the irrigation, which not only makes agricultural settlement closer wherever it obtains, but provides the vegetable food of the Hindus for countless thousands beyond the schemes. It may be held to have saved the lives of millions who would otherwise have perished, and to have enabled them to beget millions more, whom it now assists to maintain.

Is this a real gain? Does it deserve the name of progress? Does it benefit either the individual or the race? Many will reply without hesitation in the affirmative; but surely in so doing they confuse the size of a nation with its eminence—they mistake quantity for quality. By multiplying the means of life the multiplication of the human beings within reach of them is encouraged until exactly the same position is restored. When there was food for 5,000 there were 6,000 hungry mouths, and when by irrigation
the fruitfulness of the same territory is increased, making it yield food for 15,000, there will soon be 16,000 hungry mouths demanding to be filled. The man who makes two blades of grass to grow in place of one has always been reckoned a benefactor, and hence it is argued why not place higher the man who enables two human beings to live, where until then only one could be maintained? This, of course contains the implication that life in India is a good in itself, and that the lives of those who are multiplied ought to be held desirable. But is the ryot’s life worth living? That is the essential question, to which the fact that he continues to live as long as he can may possibly appear to offer a kind of answer. Measured by a European standard, the reply to the question would be “decidedly not,” unless, indeed, it had been put to the Russian Jew, the street-walkers of London, the factory slaves of the Continent, or the servants of New York, to whom the simple animal life of the Hindu farmer might by contrast appear desirable. In what sense can the ryot be said to live? “Half our agricultural population,” said the present Governor of Bengal, “never know from year’s end to year’s end what it is to have their hunger fully satisfied.” These half-fed tillers of the soil are numbered by tens of millions. Is it progress to provide them with food which enables them to multiply, and to continue multiplying, until the margin of sufficiency is again reached, and a greater host than ever exist on the very verge of famine, and in the daily presence of possible starvation?

There is no necessity to raise the general Malthusian question. Civilisation implies new conditions and fresh factors. Taking India as it is, it seems as if there is little or no intellectual progress or moral growth among its multitudes. Their condition is so extreme that they have not the means, if they have the mind or inclination, for culture. The ryot to-day is the same being as the ryot of one or two thousand years ago. He literally lives now, as he lived then, from hand to mouth. In mind, character, faith, and practice, he appears unaltered and unalterable. The country is rich, fertile and well governed, but he and his are victims of a grinding poverty, which erases from their existence all but the animal—and often the animal too. New land feeds its thousands, and irrigation its tens of thousands, but they remain the same hopeless creatures as before. There are more of them—that is all. It is impossible for civilised man to regard them as locusts or rabbits, though nature deals with them just as mercilessly, and by the same means. Before the Briton came there were periodical famines which depopulated parts of the country. There were frequent wars, insurrections, and rebellions, stamped out with severity. The motto of the successful was always Vom Victis! The absence of sanitary knowledge, of scientific surgery, and of simple medical teachings, all contributed to reduce the surplus. These sources of diminution stopped, and famine itself fought by means of irrigation and railways, the protective measures of the British Government seem after all only a castle of sand upon the shore, which the rising tide of population will inevitably overflow.

There are contributory causes, such as usury, bad landlordism, caste limitations, and superstitions which help to embitter Hindu life; but they may be left out of account. It is possible that they may be altogether removed some day. On the other hand reforms may mitigate, but cannot cure, the world-wide disease of poverty, with all its attendant ills and ignorances, which render the coloured subjects of the Queen in Asia, as Florence Nightingale said, “the saddest sight to be seen in the East, nay, probably in the world.” The pressure of population upon the limit of subsistence depresses their level of human life close down to that of the beasts, and keeps it at the mercy of the monsoons. The more peaceful the times, the more fruitful the fields, the more just the law, and the more they multiply. This is the one indisputable result. Is it worth the labour? Such is “the riddle of the painful earth” presented most impressively throughout India. The Spencerian doctrine, that reproduction diminishes as the intellect develops, has little application to the myriads that swarm in Asia. Mental enfranchisement demands leisure, as well as force of aspiration, and these in India appear to be permanently limited, by the mere weight of numbers, to the very few. The struggle of the British Government to raise the masses, like that of the daughters of Danaïs, seems fruitless as well as endless; the courage, energy, self-sacrifice, ability, and benevolence of its rule, idle and without avail. The history of its superb conquest of the elements, like that of its conquest of the country, when viewed from the standpoint of philosophic history, concludes, not with a peace, but with a melancholy question—Cur hoc?
CHAPTER III.

PHYSICAL AND POLITICAL DIVISIONS.

The extent of the peninsula and the immense variety of its physical conditions require to be impressed upon the reader at every stage. Its dimensions may be more clearly realised by Australians if compared with the immense expanses of their own land. Its area is equal to that of Victoria, New South Wales, and South Australia united, and the population of any one of its dozen provinces is much greater than that of the whole of Australasia. On our continent there are about 3,000,000 people, while India and its subject States contain 286,000,000. Bengal alone maintains more people than the United States.

Canning’s advice to Lord Granville, “Never write or speak of Indian things without looking at a map,” is applicable not only to political, but physical conditions, which are as various and often as contradictory. Stretching, as it does, through 28 degrees of latitude from the bleak and wintry flanks of the Himalaya Mountains, through stony plateaux to the rich alluvial valleys of the Ganges or the Indus and the low sandy coast lands of the southern Presidencies, stretching under a tropical sun, the peninsula offers almost every possible climate, soil, and product. It embraces the driest and the wettest parts of the globe; deserts as barren in fierce aridity as the Sahara, and deltas as fertile with perpetual moisture as that of the Nile. There is cultivation of some kind everywhere, for agriculture is by far the most important interest, and occupies the great bulk of the people, and irrigation is almost everywhere pursued where the rainfall is heavy as well as where it is light. But the cultivation and irrigation vary every locality, and exhibit the most evident contrasts from province to province. Hence it is essential that each district should be considered in a large measure separately, and that whatever aspect of life or industry is dealt with, the limits within which the statements made apply must be plainly indicated.

Gallia est omnibus dextra in partibus. This first sentence of Cicero’s Commentaries, indelibly imprinted on the mind of the schoolboy, may be appropriately applied in the present connection. Politically India is divided into three Presidencies, Bengal, Bombay, and Madras. Strictly speaking, the name Bengal applies only to the great Gangetic delta which is placed administratively under the jurisdiction of a separate Lieutenant-Governor, but it also includes technically by its official relations the large and populous territories of the North-west Provinces, the Punjab, Assam, and Burmah, which have as little physical resemblance to Bengal proper as to one another.

The Presidency of Bombay possesses no less variety of climate and conditions than Bengal, for it embraces the Malabar coast, where rain is abundant; the highlands of the interior, where it is irregular, and requires supplementary storage; and the sandy tracts of Sind, destitute of precipitation but made fertile by periodic inundations. While Bengal politically includes northern India from east to west, Bombay comprises the west of the peninsula. Madras, completing the coast on the east and south, presents the same physical contrasts, combining the Coromandel sea slope, in which occur deltaic tracts of unsurpassed productiveness, with stretches of arid territory, in which pestilence has slain its thousands and famine its tens of thousands. As the political divisions determine the titles of reports and accounts relating to irrigation works it is necessary to note them.

But it must be remembered that mere geographic labels are of no importance whatever in connection with irrigation. This is governed absolutely by the great physical conditions of the peninsula. These, and these alone, is it necessary to grasp in order to comprehend its engineering. That the schemes are projected, executed, and controlled by one staff instead of another, or that the reports relating to them are headed with the name of a particular presidency or province, is merely a matter of accident. Nevertheless, the accident is permanent in its effects. One is compelled to deal with the works in groups, which in some instances have a merely artificial connection. In order, therefore, to prevent incorrect impressions, it is essential to unfold and fix in the mind’s eye in place of the familiar political map of the three Presidencies and native States, a physical chart of India which shall render the criticism of irrigation works independent of these nominal denominations. To make this vivid, a certain boldness of outline must be secured, justified by its large and general truth rather than by minute accuracy.

Fortunately, this immense territory lends itself marvellously to such a treatment, for with all its striking varieties and contradictions it falls naturally into a few great divisions capable of being clearly marked and readily remembered. In the first instance there is to be realised the isolation, or what has been termed “the insularity of India.” Washed on two sides by the “unplumb’d salt estrangling sea,” it has been separated on the third side from the rest of Asia by the highest mountain chain in the world. In this there are practically but three considerable passes. The geological, climatic, and productive conditions of the country of the Hindus are distinct from those existing beyond this range. India is self-contained, and has been mainly self-developed. It is a whole physically, and must be so grasped, although described in detail. Its several divisions are parts of one great whole.
The shape of the country is roughly that of an equilateral triangle resting upon the great plateau of Central Asia, with its apex projecting into the ocean. Along the base, in a great northerly curve, rise the Himalayas, at once the source of isolation, security, and abundant water supply. If the base be bisected and lines drawn thence seaward cutting off the corners of this great triangle, so as to form two smaller triangles on the north-east and north-west, of which the former is the larger, this will leave a diamond-shaped figure of fairly regular proportions in its stead. In other words, lines drawn northward from a little south of Cuttack on the east, and from Gujerat on the west, meeting about Naini Tal, will produce the result. Pare off a narrow strip of the south-west side and a border strip of the south-east side, reducing the lower and larger part of the diamond, and we have then a picture of the country which will serve with very little alteration to mark almost all its peculiarities. Were the ocean to rise about 1,000 feet it would submerge the right and left upper corner triangles and the southern strips, which we have supposed cut off, and would leave just such an immense diamond-shaped island to be washed by the waves of the Bay of Bengal and the Indian Ocean united to the north across the imperceptible line which still divides the watershed of the Ganges from that of the Indus, as now through Palk Strait and the Gulf of Mannar. Those who are fortunate enough to have seen the splendid series of statistical maps prepared by Sir Edward Buck for the Colonial and Indian Exhibition, accompanied by explanatory essays of lucid clearness, will be able to readily seize upon this presentation of the conformation of India, which a scrutiny of those maps has suggested. India est omnes civitas in partes tres. This is true, physically as well as politically. There is a great diamond elevation in the centre and a northern triangle with a southern strip attached on each side of it.

Such a sketch gives at once certain large contrasts in characteristics which simplify the problem. The diamond is the high interior plateau running through northern and southern India, while the triangles are low-lying plains uniting it to the Himalayan range above, and the strips are sea slopes on either side below. The diamond is rocky, basaltic in the west, and archean in the east (gneiss schists, &c.), while its pavements are all alluvial. The diamond and the western triangle are arid; while the eastern triangle and both strips are rich in rivers and enjoy an abundant rainfall. Population in its density follows the rainfall exactly. Where it is heaviest there rice is the chief staple, while in the diamond the millets, and to the west and north of it wheat takes its place. The triangles and strips comprise four-fifths of the agriculture of the country, while the diamond has but one-fifth; they include nine-tenths of the irrigated area, while it possesses only one-tenth, and finally the triangles and strips are the territories annexed and ruled by Great Britain, while the independent States cluster in the rest of the peninsula. Kashmir and Nepal lie in the Himalayas, out of comparison, and the portion of the western triangle belonging to Rajputana being independent and thinly peopled may be reckoned as part of the diamond. With these slight exceptions, the subdivision stands good and may be accepted as a working plan. The high-lying rocky diamond-shaped plateau of the interior, with uncertain rainfall, small rivers and scanty population, little agriculture, and less irrigation, is under native rulers. The low-lying alluvial triangles and strips, with heavy rainfall, large rivers, and a dense population, cultivating and irrigating on the greatest scale, are under the shelter of the British flag.

The climate of India is tropical, over all the area projecting into the ocean; that is to say, there is an evenly high temperature maintained all the year through, varying comparatively little from one season to another. There is no cold weather, and what is called winter is like an Australian summer without hot nights or hot winds. The northern portion, known as Hindustan proper, forming part of the mainland of Asia, exhibits greater thermometric extremes, the winter being cold enough to admit of the growth of the summer products of Northern Europe, while the summer heat is as fierce and dry, in the west, as that which searches the caravans of the Sahara, or the interior of Arabia. But for its rivers this region of northern India would have been as desolate as they remain. In Bengal, to the east, the contrasts of the year are less marked, and the heat is moist, producing a wealth of vegetation such as is found in Ceylon. Ascending the Himalayas the voyager passes from a garden, through a jangle, to the forests of the temperate, and then to the barrenness of the Arctic zone. The regions of perpetual snow are important because of the supply afforded to the rivers, when the rains have ceased and the months of parching heat begin.

Within the boundaries of India there is a remarkable regularity in the direction of the winds, which greatly affects its rainfall and cultivation. In summer the unsparing sunbeams heat the land to such an extent, day after day, that it acquires the draught of a furnace, and sucks in a moisture-laden atmosphere from the sea. This flows lightly up the eastern coast, its clouds breaking heavily in Bengal, before turning inland across the great plains, or rising to condensation point upon the crests of the mighty peaks which stand sentinels before the plateau of Thibet. Little moisture from the west passes the Ghauts, which run close to the Bombay shore, so that behind them one finds a comparatively rainless strip. Indeed, the east coast as a whole is dependent upon the return of the monsoon, when in its autumnal course it sets southward, following the sun. The Panjub derives a somewhat precarious supply from occasional visitations of both monsoons. Regular as these are in their recurrence, they are not regular in the amount of moisture they yield, except in the coast districts, and in the north-east. Everywhere else they fail occasionally, and in some parts frequently. Nothing in such circumstances can stand between millions of people and starvation, except irrigation, and often the means of irrigation suffer too. When two or three such seasons occur in succession the wells in many districts fail, the rain-fed
streams dwindle, and storages shrink. In such cases the last dependency of the helpless population rests upon the rivers distributing among their fields the stored-up waters of the glaciers and snow fields, which, rising half the height of the world’s atmosphere, have held it there in suspension for months, or perhaps for years.

The rivers of India play an immense part in its history, for it is chiefly by their action, during untold ages, that the triangles and strips before alluded to have been built up in the first instance, and watered since. As a country India is peculiarly favoured, since not only are the inner slopes of the Himalayas drained to the west by the Punjab tributaries, and to the east by the Ganges and its feeders, but in addition the further valleys on the northern side are tapped by the Indus and Brahmaputra in the same way. Their sources lie not far apart in the heart of the hills. They encircle the whole country, and pour into its plains the priceless tribute of innumerable peaks and plateaux beyond its pale. The deltas, the Indus on the one side, and that in which the Ganges and the Brahmaputra blend on the other, are in themselves populous countries of great extent and productivity. They are represented on a smaller scale along the whole of the east coast, where half-a-dozen great rivers, fed from the mountains of the interior, are engaged in the same unceasing work of creation and preservation. The streams of the west are in the south necessarily shorter and less valuable, but above Bombay the Nerbudda stretches more than half across the peninsula, its source, not far distant from that of the Sone, dividing the diamond into a small north-western and larger southern part.

At least three Indus streams must be reckoned among the great rivers of the world, for the Indus and the Brahmaputra have each of them a maximum discharge far greater than that of the Nile, while the Ganges in flood outpours more than four times as much as the Nile, and half as much again as the Mississippi. It would be impossible to overstate their value to the Hindu. Most of the streams are objects of worship to the people generally, and naturally that river which lies nearest is credited with the greatest sanctity by its neighbours. Doubts may be entertained as to their spiritual influences, and probably it is a matter of indifference to the engineer whether the Kaveri possesses, as its villagers assert, a fourth more power of washing away sin than the Ganges, or whether it is more accurately entitled Ardha-Ganga, half the Ganges. To the health officer ablutions performed under a religious sanction appear to remove no more physical uncleanness than if undertaken for purely secular reasons, and the value of rivers to the irrigator is measured by sight rather than by sacredness. Nevertheless, the fact remains that the material wealth and prosperity, and indeed the lives, of many millions, depend upon these rivers. They win their special honour by the regularity of their flow—a fidelity deeply realised when the earth is iron, the heavens are brass, and those who trust to other sources of supply are perishing fast, beside the empty reservoir, or the dried-up well.

Nevertheless, the area irrigated from canals drawing their supply from snow-fed rivers, is smaller than that from canals running out of rain-fed rivers. In the latter are included many rude schemes, such as those consisting of inundation channels, which have no head works, except perhaps a wing dam or spur, or perhaps a temporary weir, renewed and swept away each season. Those which have permanent works at their head giving a sufficient storage, enabling some of the waters of the rainy season to be retained and disbursed slowly during dry weather, supply a larger area than the inundation canals. But by far the largest area of all is watered from wells either by hand or bullock draught. In spite of the rapid extension of canals and the magnificent works constructed in all the Presidencies, the well remains today the source of a far larger supply in India than all others put together. This is a fact not to be lost sight of, since it illustrates two chief characteristics of the country—first the abundance of its water supply, and next, the cheapness and plenteousness of its labour.

There is water under the soil almost everywhere in the triangles and strips of low lying alluvial land, but at the head of the plains in the Punjab and Rajpootana it is usually at such depths as to render lifting too slow and costly even for the Hindu peasant. It is here, therefore, that great canals are to be found—here and in the north-west province (lying to the south-east of the Punjab), where, though the water is at less distance from the surface, it is not everywhere obtainable, and the conditions are specially favourable for canalsation. Nevertheless, even in these provinces the plains are honeycombed with thousands of wells stretching southwards, until the rainfall increases so much in Bengal as to render irrigation unnecessary in most seasons. There are canals for famine protection, special cultures, and navigation in Bengal, but they are not the mainstay of the country in this delta, nor in that of Orissa. Proceeding down the east coast, however, we find other conditions. The rainfall here is far less trustworthy, and each delta in Madras has its works for the diversion of river waters. Where the canals do not reach, innumerable wells have been sunk to take their place, and expensive storages constructed wherever possible. On the west strip irrigation is not required, and within the diamond it exists mainly in the shape of reservoirs, for which the rocky nature of the country offers many facilities, or wells, wherever these can tap a supply. Sindh is watered every year by the rising of the Indus, just as Egypt is watered by the annual floods of the Nile, and by means of similar works, except that there is no barrage yet constructed. There is but one perennial canal in the whole of this province.

We have now completed a rapid survey of the irrigated portion of India with which we have to deal. We find first and most often the well. There are wells in the north, centre, along the eastern strip, and in all river or other basins; rain-fed canals in the north and north-west; deltaic canals in Sindh, Bengal and Madras, and reservoirs in the interior plateau, on the west coast sometimes feed-
ing canals, and on the east often dependent solely upon rainfall. The natural formation of the country has been studied and followed by its inhabitants. Wherever there has been water available it has been eagerly seized upon. Whether by well, by reservoir, or by canal, it has been caught and utilised. Wet cultivation is being carried on in all quarters and in all conditions. In a word, where the rainfall is deficient, India is irrigated in every part where irrigation is possible.

So far as the lessons of irrigation to Australia are concerned a great part of the continent can at once be blotted from the map, and omitted from further notice. The narrow strip in the west between the Ghauts and the sea, with almost the whole of Bengal proper, and Assam to the east, and the territory immediately under the hills, where the rainfall is sufficient, may be ruled out. The whole of the diamond-shaped plateau, except in a few districts, the plains of Central India and the sandy desert of Rajputana offer us little not better taught elsewhere. Bombay has a few schemes which will well repay special criticism; but only a few. In point of fact a half circle, beginning at Sind and passing up the Indus and down the Ghauts valley, avoiding Bengal proper, but sweeping down the east coast to Cape Comorin, comprises the area of India in which irrigation is the most important factor. This is "Irrigated India." Omitting Bengal proper, such a circuit embraces the most populous and most prosperous tracts. Within this charmed area famine finds few victims in ordinary years.

But before considering the irrigation works it will be essential to distinguish more definitely the physical qualities and agricultural facilities of the several Presidencies in a series of short chapters. Their commercial prospects and the characteristics of their tribes cannot be ignored, although it will only be possible to take a hasty glance at the circumstances of each province. Before doing so, it will be convenient to take a general survey of Ceylon, which also comes within the scope of this work.

CHAPTER IV.

CEYLON.

Ceylon, the "Serendib" of the Arabs, the "Lanka" of the Hindus, and the "Tapeobone" of the Greeks, has always enjoyed a romantic reputation. It is thus described in the seventeenth century, in Purchas's Pilgrimage:—"The heavens with their dew, the air with a pleasant wholesomeness and fragrant freshness; the waters in their many rivers and fountains, the earth diversified in aspiring hills, lowly vales, equall and indifferend plains, filled in her inward chambers with metals and jewels, in her outward court and upper face stored with whole woods of the best cinnamon that the same art; besides, fruits, oranges, lemons, &c., surrounding those of Spain; fowles and beasts, both tame and wild (among which is their elephant, honoured by a natural acknowledgment of excellence of all other elephants in the world). Those have all conspired and joined in common league to present unto Zeilin the chief of worldly treasures and pleasures, with a long and healthful life in the inhabitants to enjoy them." While the picture cannot be accepted as complete, it errs only, as most panegyrics do, by omission of the facts which would modify the eulogy.

The island is a little more than three-fourths as large as Ireland; pear-shaped, and consists of an extensive belt of plain, largest to the north and east, surrounding a central mountainous area in the south-west, whose peaks, from 6,000 to 8,000 feet high, rise suddenly from the rich flats below clothed with an unrivaled profusion of tropical foliage. It differs from India, in that its history exists in a vicingly chronicle—the "Mahavansa"—from some centuries before our era; but it exactly resembles India in that from the earliest times it has been subject to constant invasions, which have long confined its original race to the hill fastnesses, and given to its most fertile portions a changing series of conquerors. The Portuguese and the Dutch preceded the British in their supremacy—the first distinguishing themselves by their ferocity, and the second by their servile greed. Kandy, the ancient capital, was not finally taken by the British until 1815, and its great natural advantages as a stronghold destroyed in 1820 by the splendid road which winds up its precipitous heights and spans its foaming torrents. Up till this time the place had been fortified by means of plantations of native thorn, entered only by wooden gates.
the Amir of Afghanistan on the one side, and imperfectly-fulfilled
pacts with the British on the other. But it is not for these that
there are forts in the passes, railways thrust towards them,
garrisons on the watch, and subsidies to the wild hill-men.
Beyond Kabul and beyond Kandahar, nearer than Merv and closer
to Herat, glitter the lances of the Cossack and floats the advancing
standard of the Czar. With intervals of apathy and forgetfulness,
with flashes of feverish impatience and anxiety, the sentinels from
Peshawar to Quetta wait for the long-looked-for signal which shall
tell of yet another invasion of India. It will come through the
same passes, by an until lately unknown race, filled with the same
ambition and the same keen appetite for plunder, which actuated
the hordes, that from times before records until now, have marched
eastward to make the peninsula their own. Once more the Punjab
will be the centre of resistance, and once more the fate of India
will be thrown into the scale of war.

CHAPTER X.

THE AGRICULTURE OF INDIA.

Having made the circuit of the provinces, there is yet another
aspect of the country as a whole and of its people demanding to be
dealt with, in order that its irrigation may be appraised. This is
its agricultural development and its prospects, which have formed
the subject of much enquiry of late years.

"Of all branches of Indian industry, agriculture, which consti-
tutes the occupation of the great mass of the people, is by far the
most important. We believe it to be susceptible of almost indefi-
nite improvement. . . . Agricultural and commercial progress
go together." Such was the opinion expressed by Lord Mayo and
his Government in 1871, giving official endorsement to a common-
place of Anglo-Indian experience. That India is almost wholly an
agrarian country has been already pointed out, and that com-
mercial progress inevitably follows that of agriculture is true
everywhere. It is the second assertion of the paragraph, that
agriculture is susceptible of almost indefinite improvement, which
requires comment. In a limited sense this is true all the world
over, but as the possible inference in the minds of most people
would be that the statement is intended to convey a reflection upon
Indian agriculture in particular, it is of moment to know at the
outset what its prospects really are. Necessarily the condition of
agriculture is a chief element in determining whether irrigation
works shall be profitable or not. The question as to the means
and methods of the Hindu farmer is therefore of the first importance.
Are these capable of indefinite improvement? Is their present
condition so very bad?

A few years ago the probabilities are that such queries would
have been answered unhesitatingly in the affirmative. It was clear
to the most cursory observation that the ryot cultivated his patch
of land without any regard to the principles obeyed by the English
or American farmer, and the conclusion was at once arrived at
that the ryot was densely ignorant of his own business. European
practices being right, Indian practices were palpably wrong. If
the ryot could be induced to change his system altogether, and
supersede that which his ancestry had followed for generations, by
cultivation according to modern ideas, it was argued that "indefinite
improvement" would immediately follow. The Hindu, however,
with the greatest caution, and always prefers that his neighbours should try experiments for him. In these particulars, however, he is not singular, among the farmers of the world.

Undoubtedly the "indefinite improvement" hoped for in Indian agriculture must be first in the farmers themselves. It is perfectly evident that this will not be accomplished, until a stronger case can be presented in favour of reform than is usually submitted by Europeans, who begin with the assumption that they have only to teach, and the ryot only to learn.

It is now ten years since the Government of India, on the recommendation of the Famine Commission, decided upon establishing a department of Agriculture, and appointed Sir Edward Back, well known in Australia in past years, as its chief. If ability and ambition on his part could have sufficed for the work, the best results would have been soon achieved. But at the very outset he was directed to undertake, in the first instance, the supervision of the land records of the empire—an immense task, which has been continued ever since, and is still far from final accomplishment. As the land revenue, which is the great source of income, is based upon the assessments made from those records, the paramount importance of this duty cannot be gainsaid. The net gain to the revenue by departmental action is already over £200,000 a year. Nevertheless it was an unfair burden to impose upon a young office. In consequence the central department has done great work for the revenue, but next to nothing for agriculture up to the present time. The separate Presidencies have each essayed to grapple with some of its problems, and have accumulated by degrees a fair share of experiences, though it would be scarcely an exaggeration to say that in most cases the results are negative.

It is now admitted that there was a bad choice of the first managers, who were really gardeners rather than agriculturists, and that some of the sites of the farms were unsuitable for experiments. Nevertheless the failures obtained are instructive. After much entreaty the Government of India has taken a step onward, having a short time since obtained the services of the celebrated Dr. Voelecker from the Imperial Government. He has made an exhaustive examination of the agricultural possibilities of India, and is presenting a report. A conference on the question has been held at Simla, and resolutions arrived at to which it is proposed to give effect if, upon the report of Dr. Voelecker, they still appear judicious. It is intended to take immediate action after the consideration of that report to put Sir Edward Back in a position to carry out his projects for agricultural education, and therefore it may be anticipated that the Indian Department of Agriculture will soon be organized upon a new basis, and begin the practical action which has been postponed so long. Meanwhile good work is being done by agricultural shows and experimental cropping.

Whatever Dr. Voelecker's report may contain, it may be safely prophesied that it will not reveal much of the mind of the ryot. Suspicious of his landlord, when he has one, suspicious of the
Government as his tax collector, and suspicious of all unofficial inquirers as having a design upon him, the farmer at his best is usually incommunicative, and at his worst is deliberately misleading. Sir Alfred Lyall, who knew him well, depicts a farmer as saying:—

There comes a settlement Hakim, to teach us to plough and to weed; I sowed the cotton he gave me, but first I boiled the seed; He likes us humble farmers, and speaks so gracious and wise, As he asks of our manners and customs; I tell him a parcel of lies.

Under such conditions, it may well be surmised that the ascertainment of Hindu methods, and of the reasons for their adoption, is by no means easy. All that is now known has been gathered by the patient scrutiny of canal and revenue officers, or from the more intelligent members of the class. Professor Wallace declares that some of those with whom he conversed were quite as well versed in their business, and as well informed as to the properties of their land, and the grasses with which they had to deal, as white farmers are. But, so far, little of the local knowledge has been made available, and it must be confessed that the Agricultural Department knows next to nothing of the soils of India, or of their main products from scientific observations of its own. Until this knowledge is mastered, and the methods of the people have been thoroughly examined, it would be premature for Dr. Voelcker to dogmatise either in praise or blame of the ryot or to attempt to propose reforms.

It has been quite a mistake to suppose that a rotation of crops was not followed, for as a matter of fact there are many rotations in use in all parts of India, and some such practice is found everywhere. Fields are regularly fellowed, and in many districts manure is carefully collected and judiciously employed. Those who have attempted to introduce iron ploughs have met with but moderate success, and for good reason. In the first place Indian cattle are not strong enough to draw them, in the next place in many soils their use under a hot sun simply bakes the earth into bricks, while the native habit of ploughing immediately after rain, or irrigation, in what is simply mud would be impossible. Finally there is the great difficulty of getting them repaired. Repeated scratchings of the surface are all that is needed for most crops, and these are given by frequent ploughings, so that in the end the best results are often obtained, not with the imported plough, but with the sharp pointed stick, which serves the ryot for that purpose, and upon which he has to throw his weight in order that he may make an impression on the soil. There are cases where deep ploughing has been found to be advantageous, as for sugar cane, or in certain loams, but the knowledge when to use the iron and when to use the wooden plough has yet to be gained. If then comparatively little is known of Hindu farming, it is none the less sure that many of the innovations pressed upon the ryot would have been less profitable to him than his existing methods are. Can it be wondered then if he regards all new proposals with distrust? It has been proved to him that his European advisers are not infallible, and that their recommendations need to be well considered. The principles of European agriculture have yet to be adapted to an Indian environment. This will be the first duty of the reorganized department.

It would be to run to the opposite extreme to suppose that the farming of the Hindu is as good as it ought to be. While very far from this, it is sometimes as good as it can be under existing circumstances. The circumstances are unfavourable. Cattle droppings, which should yield the largest quantity, and excellent quality of manure, are used as fuel, and though the ashes are preserved and returned to the fields, some of the most valuable properties are lost. It will be impossible to avoid this waste until other fuel is furnished. Although the cattle in Bengal are twice as numerous in proportion as those of the United Kingdom, they could not be trusted to perform one-half the work, not merely because they are small, but because they are ill-fed. Nothing can be done to improve them until better food and more of it is secured for them. The implements employed are of the simplest—most of the work on the farm, from clearing to weeding, being done with an adze-shaped hoe. In road-making, and canal excavation, a few rude baskets are used as well. As the Hindus almost invariably work squatting on their haunches English tools are unsuitable. A great deal of cultivation is done by hand in market-garden style, but the failure to return to the soil the proper elements necessary for its full fertility, renders the crops shorter and thinner than those which Australians are accustomed to see, except in bad years, or in those districts where continuous cropping has already impoverished the soil.

The situation is intricate in every aspect. An Indian farmer fully appreciates manure, but cannot afford to purchase it. The fields nearest the villages fetch a higher rental because of their fertilisation with the refuse. But this bears no proportion to the whole area in need of replenishment. Density of population operates both for and against the ryot. It leaves him but a plot to attend to; those who have not tenant-rights often owning (in Behar) no more than 1½ acres; hence they can devote an amount of care to its tillage impossible on the larger blocks worked in Anglo-Saxon communities. In some places only 6 per cent. of the land remains for grazing; all the rest capable of cultivation being under the plough. It is easy to perceive that there remains plenty of scope for the improvement of agriculture, but that to do it the work must be begun upon a broad basis, and carried out gradually. A revolution in the condition and practices of millions is not accomplished at once, even in India. Nor can one reform be effected without others. Gradually the whole system may be brought into better order.

The wants of the ryot may be recapitulated. First and foremost, water, to supply which the State has already done much; next manure, i.e., to preserve the scanty store of cattle droppings...
The agricultural classes will be able to work, produce, and exchange, with greater freedom than they have ever yet done. In these directions there is the possibility of a great and speedy advance, so that in another 20 years we might see agriculture, and the agriculturist of India, put upon a footing which would transform both, without much apparent aid from European ideas, or much ostensible dependence upon European skill. To make the best of India, upon Indian methods, and by means of Indian agencies, is the first, and one of the greatest ends of the new Agricultural Department.

Beyond this begins the task of analysing soils, waters, and manures in the light of agricultural chemistry, and of studying native practices by the experience gained in other lands. Then, and not till then, will it be possible for the department to teach the ryot how to farm, with the certainty of demonstrating to him, by the hard logic of facts, that it is his interest to do as he is advised. It is perfectly certain that he will not hesitate to adopt such recommendations as are within his resources, when it is once manifest to him that he can profit by so doing. At present it may be taken for granted that however wise Dr. Voeckler’s recommendations may be, there will be very few of them of immediate value unless they conform to local conditions, and harmonise with the prejudices of the people. Prove to them that it pays to set aside their prejudices, and the most bigoted devotee of caste will not long resist the temptation to put money in purses; spiritual advisors, for a share of the extra gains, will discover a loophole in the prohibitive maxims of their creed, or award an absolution, and after a sufficient time, will even embody the procedure, now denounced as heretical, among the orthodox practices of the caste. It is by such means only that the “indeterminate improvement” desired may be made definite and actual. Dr. Voeckler is an extremely able man—an expert of European reputation—and it is to be hoped that he will recognise these local and racial peculiarities in his report.

In considering questions connected with agriculture, it must be remembered that the ryot is not the misguided blunderer once supposed; that he knows his business as a farmer well, and that he cannot be improved upon unless the conditions under which he works are altered. These are capable of great improvement gradually and by native means. The task of practically educating the ryot has been undertaken in each Presidency. Owing to early blunders little has yet been achieved in Madras, where unfortunately a parasitical policy appears to prevail in this branch. The department in Bengal proper has been overweighted like the Central Office, and underpaid as in Madras. The Punjab has, if anything, less to show than either, though some excellent work has been done in all three.

The field for agricultural expansion is more limited in Bombay, which is less dependent upon its own farms than its neighbours, but has none the less displayed a characteristic energy in its rural policy. Its Agricultural Department has been more of a reality; has displayed more vigour and independence, and has issued excellent reports. One of its publications is a statistical atlas, showing at a glance the population of its several districts, their liability to famine, and the remedies most applicable in each instance. By this means the campaign against want may be carried on with knowledge, and an adaptation of means to ends, impossible under the sudden pressure of calamity. The situation on the whole is scarcely im-
proving from the State point of view, which is concerned with food supply rather than export returns. New difficulties have arisen out of the very successes of agriculture in that regard. The growth of wheat is largely dependent on oil seeds for sowing, has been so profitable as to encourage upon the area previously devoted to food grains for local use. The soil sustains larger demands; the rotation of crops is less regular; bones are sent out of the country, and the return of manure to the soil is absolutely insufficient. The population in times of peace and prosperity has gone on multiplying, and the limit of cultivation within the Presidency has now been nearly reached. The Agricultural Department perceives the dangers ahead, but does not possess powers sufficiently great to conquer them.

Agricultural shows appear to be exciting interest, and at Kolhapur, where a show and fair was held conjoined, there were in 1889 no less than 23,597 animals exhibited, as against 6,003 in 1885. The stock interest in being studied by setting apart one State farm for breeding, and another for the production of good milkers. In this connection it may be noticed how English practice and the influence of its ideas are modifying the circumstances of native life. Formerly the cultivator found no difficulty in having his cows served by some of the many bulls, which either at funeral ceremonies, or in fulfilment of a vow, were dedicated to one of the deities, or else were freed by strict Hindus who would not traffic in cattle. These animals were always strong and sound, and as they were never worked, but roamed at large, feeding at will upon crops and pastures from which they were rarely driven, furnished fairly good sires. The Cattle Pounds Act, however, makes no distinction between a sacred and any other bull; pious people of the neighbourhood grow weary of perpetually buying them out, to prevent them being purchased and killed by an unbeliever, while the decaying religious zeal of the community is manifested by the rapid decrease in the number of animals dedicated. The ryots appreciate a good stud bull, and sometimes even combine to purchase or travel far in search of one, but under the altered circumstances, it is becoming a necessity for the Agricultural Department to take steps to provide good stock for the purpose.

A brighter prospect for stock raisers has been already opened by the departmental successes with lucerne and ensilage. On the Sind farm at Hydembad, lucerne has been proved the best paying crop, is now cultivated every year, and is coming into favour with the wealthier natives. Probably there, as in the North-west, it is unable to endure the scorching heat of summer, and requires to be sown afresh each year as a winter crop. When I had an opportunity of seeing a small patch it was very thin and ragged, in no way approaching the average growth which may be seen in Victoria. Guinea grass, much thought of in Madras, is hardly better than lucerne, giving in 1889 six tons to the acre, a yield much below the average. At Poona, 3,000 feet above the sea, ensilage has succeeded, although discouraging results were obtained both in Madras and Bengal. A pit silo having a capacity of 4,050 feet was filled with 68,000 lb. of jewari (sorghum vulgare) cut at the end of summer. The loading occupied 15 days, when the silo stood a foot above the brim. Then a layer of 4 inches of weeds was put on, and when the temperature rose to 120 F., the top was plastered with 2 inches of the same, and with 200 lb. to the square foot. Four months afterwards, at the beginning of next summer, the silo was opened and found to have sunk 2 feet below the brim. It was in excellent condition, and was eaten greedily by cows that had never tasted ensilage. It is at this season that fodder is scarcest, and hence this demonstration of the possibilities of winter silos, is of the utmost importance to such of the ryots as have the capital necessary for the operation.

Experiments are now proceeding at the farms to test the seeds of different varieties of cotton, of Australian and other wheats, of fertilisers for tobacco, and of barley as a plant for the reclamation of lands impregnated with carbonate of soda and other salts. But what is most wanted is a scientific knowledge of practical expatriates for improving the ryot's methods. The interculture with cotton of winter crops, such as wheat and linseed, so that if one fails the other may succeed, is strongly recommended. There is also much need of a knowledge how to cope with insect pests such as the rice grub, which destroys the crop in one district for three years in succession. Certain of the natives as well as some of the local bodies have been induced to contribute towards the prize funds for agricultural shows, but for the most part it is the Government alone that moves in these matters. The ryot is utterly unable to help himself, exercises little or no provision, and is altogether ignorant of the world beyond his village, or of the movements in it which determine his prices. For all that lies outside his fields he is dependent upon others, and also for a knowledge of what ought to be done in them, when new circumstances dislocate the ancient courses of trade.

It is the Agricultural Department of the North-west that has been making the most systematic attempts to reclaim tracts of land, which have been rendered barren by their impregnation with salts. Some of the plots have been for 15 years under culture, and are still unconquered. For a time crops flourish upon them, but so soon as the roots reach the nodular limestone below they wither. Of course it is possible, by means of persistent fertilisation and cultivation, to obtain a good soil upon any site, but the process is not remunerative. When trenched with night soil, and well irrigated, the poorest patches soon become productive; but this is only possible for limited areas near large towns. When the "urari," as it is termed, is below canal level, it is always practicable, by means of colmatage, to put upon it another new soil, formed by deposits from the canal water, whenever, owing to rains or floods, it is heavily charged with silt. Such land is invariably fertile, and lets well. If water can be dammed back upon the "urari" sufficiently long, it almost invariably results in a luxuriant growth of aquatic grasses; but whether it can be rendered fit for agriculture
by this means is not yet determined. By far the most promising plans of reclamation yet proposed are those now in operation near Cawnpore. On one plot the land is protected from the encroachment of cattle by means of fencing or ditches, and the patchy growth of vegetation which follows is carefully watched. Siltbush is planted in likely places, or in pits filled with better soil, and it is thought that by this means the land may be gradually covered with vegetation, akin to that which springs up on the sand hummocks of the Australian coasts, where they are protected against stock. On another site cattle are pastured upon adjacent lands, or upon the

The milk of the cattle is sold to provide for their maintenance. It is found that land so treated becomes cultivable much earlier than was anticipated, and the hope is now cherished that by this simple means a considerable area of worthless land may be gradually made rent producing. The denudation of the hill country having caused some alarm, an effort is being made to check it by means of embankments which will operate as storage until they are silted up with the collected deposits of rich soil at present washed away from higher lands. The beds could be cultivated in the dry season.

Such attempts as these to resist the losses of humus suggest at once the special difficulties of the country, overpeople as it is in particular parts, where the soil itself has to be created before humanity is possible. The lesson which it furnishes is especially marked, when its condition is compared with that of an underpopulated continent like Australia, and it is necessary to bear this in mind continuously. The holding of the poorer selector would appear a great estate, his simple fare succumbing, and his bare hut palatial to the Hindu, three-parts naked, living on coarse grams and wild fruits, housed in mud and straw, without machinery, and almost without implements. The Agricultural Department of the North-west does its best to repair his deficiencies, and in order to help him devotes its attention to experiments with early and late sowing, and improved methods of farming; grows its own crops, so as to be able to forecast from them the yield to be expected each season; produces pedigree seed for distribution, and makes and sells simple implements at cost price.

There was a time when its agents travelled the country like hawkers, exhibiting its ploughs, working them, and selling them on the time-payment system, but owing partly to the misconduct of some of its officers, and partly to the growing power of defeating anything from the Crown, who purchased, this extraordinary development of paternal government had to be abandoned. Natives visit the State farms and are presumed to carry away fresh ideas; there is always a demand for men who have served their apprenticeship upon them, or in the gardens at Saharanpur and Lucknow; and the agricultural shows, at which simple machinery is always exhibited in action, are thought to be having, though slowly, an excellent effect. The wily Hindu, however, requires to be watched in the prize taking, since he can spend, and does spend, an indefinite time in ransacking his own and neighbouring districts for special qualities of grain, selected, cleaned by hand, and arranged with scrupulous care, so as to defeat all honest competitors.

The efforts of the Central and Presidential Departments by no means exhaust the whole of the stimulus which the British Government imparts to agriculture. The land system of India is responsible for certain peculiarities in its administration, which point to the natural results of State ownership. A preamble of 1803 says that "by the ancient law of the country, the ruling power is entitled to a certain proportion of the annual produce of every piece of land, excepting in cases in which that power shall have made a temporary or permanent alienation of its right to such proportion of the produce, or shall have agreed to receive instead of that proportion a specific annuity, or for a term of years, or in perpetuity." In an official handbook which Sir James Fitzjames Stephen declared to be superior to the Acts upon which it was based, it is pointed out that "so long as the sovereign was entitled to a portion of the produce of all land, and there was no fixed limit to that portion, practically the sovereign was so far owner of the land as to be able to exclude all other persons from enjoying any portion of the net produce," and again it is added in the "Directions for Settlement Officers" that "Under Indian Governments there is practically no other limit to the demand upon the land than the power of the Government to enforce payment and the ability of the people to pay. Thus the Government is in fact the landlord of the whole colony." Here we have the single fact which under such a system all waste and unoccupied lands belong to the Crown, and their utilisation becomes of as much interest in this old civilisation as in new colonies, where vast unsettled areas have proved up till now invaluable sources of revenue and of public prosperity. Irrigation schemes everywhere, by broadening the culivable area, and pushing dry farming outward, have led to the taking up of lands to replace, or to be worked with those brought under the channels. In Madras especially this has proved an additional source of income to the State, which can fairly be credited to irrigation accounts. But there, as in the North-west, the effect has been merely an extension of already cultivated districts, which become bordered by a new fringe of settlement, or else an acquisition of blocks of unused country intermingled with those under agriculture, which have heretofore remained idle because of their being above the level of supply, overrun with jungle, or of inferior quality. In the Panjab there has been another development. Canals have been constructed leading into large areas of unoccupied Government land, to which it has been necessary to attract labour in order that the water may be employed, and the scheme rendered self-supporting. Villages have been established, not unlike the colonies which private enterprise has scattered over Southern California and Colorado. The conditions and results of this departure are of special interest in Australia, where Mildura and Renmark represent the advance guard of this mode of settlement.
Under the Sidhnai Canal there were 118,000 acres of Crown land. In 1886 the problem of securing occupation faced the Government of the Punjab very seriously, since there was then but one-third of the 64,000 acres irrigable from this scheme in the hands of cultivators. The process of settling an agricultural population upon waste lands, hitherto uninhabited, and which cannot be cultivated without artificial irrigation, is both difficult and peculiar. In some respects it is analogous to the foundation of a colony," wrote the finance secretary in his letter to the central Government in that year. The returns for 1889-90 show that nearly 64,000 acres were actually watered in the Kharif season, and though 10,000 acres of this received an imperfect supply it is evident that the whole tract has been brought under the plough during three or four years. The same practice has been pursued under the Sirhind system with equal success, while the Chenab and Jhelum projects are awesomely undertaken in order to water large areas of outlying lands, which will require to be settled before the canal supply can be utilised at all. Considering the races to be dealt with and the prevalent dislike, of the farming castes to leave their districts, the new task imposed upon the officials has been by no means simple. They were required "to build up from the very rudiments, to settle a population, to attract cultivators, to provide for the foundation and management of villages, to organise and pay the ordinary rural agency, and in fine to establish the whole economy of a new society." The country west of the Satlej at Peshawar was dry, barren, and desolate, until the construction of the Lower Sindh canal, since which 50 villages have been created, with over 60,000 acres of watered land among them. In this respect, therefore, the province has undertaken a special and arduous work in connection with its irrigation. It is encouraging to learn that it is being pursued to-day with triumphant success. The annual value of the crops grown on two of the smaller schemes is estimated at upwards of £300,000, reaped from country which, a few years before, maintained nothing but a few goats and black sheep.

The conditions of settlement differ in minor respects under different canals. The rajbhais, or branch channels, of the Sidhnai supply distributing an average length of two miles, commanding about a mile of country on either side, or about 2,900 acres in all. This is made the village block, but of course the size varies somewhat under other circumstances. Each block under the Sidhnai was surveyed into squares of 225 acres, and four of these, or 90 acres, were allotted to each settler. This is larger than the usual holding in the province, but was made so to encourage applicants, and also to induce them to undertake the expense of sinking a well, and of maintaining cattle to work it, which is only possible in the Punjab for what may be termed well-to-do farmers. A five years' lease was given of each allotment, the charges being 1s. 4d. per acre cultivated, 4s. 6d. per acre watered in spring, and 2s. per acre watered in autumn, with 3d. in the shilling for village officials and local rates. The digging of a well means the reduction of 2s. 4d. a year, per acre watered by it, for 20 years; 1s. in spring, and 1s. 4d. in autumn. The rent for the 90 acres is £1 a year, and the holding can be purchased at 6s. an acre, or £27 for the allotment, after the expiration of the lease. The covenants inserted are something like those attached to the preliminary licences and leases granted to Australian free selectors—no transfer or assignment is valid without the consent of the Department, one half must be cultivated within three years, and two-thirds within four years after possession is given; a proportion of the cost of any irrigation channels constructed has to be paid, and all minerals are reserved. Not only does the State not bind itself to supply any water, but an addition is made in the shape of a declaration that nothing in the deed confers any "right, title, claim, easement, or privilege whatsoever to or in respect of any water," a condition which would be of enormous value to the Australian Governments if it had been inserted in all grants from the early days of the colonies.

The first intention was to relieve the overcrowded towns of their surplus population by means of these settlements, but a very little experience indicated that such a procedure must be unsatisfactory to all concerned. Townsmen make bad farmers and are especially feeble in pioneering knowledge and courage. General Booth's proposals for colonies overseas, unless safeguarded by much consideration, would be liable to the same disaster. The men now accepted are very carefully chosen from those who have cultivated already, and officers take a pride in securing for the new villages within their domains the most intelligent and energetic castes of farmers. Head men, as they are termed, are sent into overcrowded tracts to beat up recruits and arrange an exodus, receiving one or two allotments as a free grant for their services if they are successful. When the body of emigrants arrive they find the land already marked out, and their particular holdings are then determined by lot, as in the old Victorian style of selection. Precautions there, as in Australia, require to be taken against "dummying." In the later settlements and unattractive districts, water rates are now sometimes remitted one-half for the first two years, and one-third for the next three years, in addition to the remissions which the colonists receive with all other taxpayers in the event of a partial or total failure of crop. The various covenants and rate bills raise no objection now to joining in one village, and though they begin by preserving their lines of demarcation, it may be hoped that communal ties and obligations will tend to obliterate them more than it has done in the old villages where they are similarly mingled. The Government, in the new settlements for which it is responsible, attends to the health, drainage, and commonage of each little community, and thus takes the place occupied at Mildura by the shire council, as well as that of the Messrs. Chaffey.

The attempt to establish a fixed rate of rent in perpetuity for land has been made in India more than once, and is, perhaps, still the ideal towards which some officials may confess a leaning. Outside Bengal, however, this tenure has nowhere attained large
proportions except in Madras, and probably is not more than 10 per cent. of the settled area of the North-west and Assam. In 1862 Sir Charles Wood decreed that the experiment of its adoption should be tried in Upper India, and a strong effort was at once made to carry out his wishes. Two years afterwards villages in which the cultivation was less than four-fifths of the culturable area were excluded, in 1866 estates likely to be enhanced in value by means of the Government irrigation works were also excepted, and finally, in 1870-71, the whole basis of Sir C. Wood's calculations being questioned, the policy was cancelled altogether. In 1862 it was announced that no further attempts would be made to follow the bad precedents established in Bengal under Lord Cornwallis. The significant feature of this failure is the complete indifference with which the offer of a perpetual rent was received by the native proprietors. The chief objects of the Government, in making so great a concession, were to earn their goodwill, and to secure a better treatment for sub-tenants. The first it was evident they could not accomplish by such means, while the second theory was absolutely absurd in the face of the experiences in Bengal, from Behar to Orissa. The principle which now obtains, therefore, is that the State determines the land tax from time to time, not increasing it in consequence of the owners' improvements, but retaining power to advance it upon fresh land brought into cultivation, or rendered irrigable by national works, or of which the produce has materially increased in value. These are the rules in time of peace; in time of war or crisis there will be, as everywhere, be no other limit except that of the capacity to pay.

The aim of the Government in India, as in Australia, is by every means in its power to induce its lessees to become freeholders, its objects being to satisfy the earth hunger which is probably even stronger in them than in the white, to induce them to improve their properties, and by increasing their stake in the country, and their interest in the preservation of order, to render them better citizens. It might well be urged on the other hand that they have become thoroughly accustomed to leasehold tenure, and that of themselves they would aspire to nothing more, that the security thus given is ample, and that the State, by retaining its ultimate control of the land, is enabled to a certain degree to protect them against themselves. The improvidence in regard to festival and ceremonial expenses, which accompanies the habitual daily penuriousness and thrift of the Hindu, places thousands of peasants utterly at the mercy of the money-lenders, who are building up great estates and rack-renting their tenants in the good old style all over India. It may be also pointed out to those in favour of freehold, and those opposed to it, as an argument that might be used on both sides, that the Government does not relieve itself of responsibility when it does give away the fee simple. In Bengal the legislature has already been compelled to pass several acts for the protection of tenants, and at the present moment another act is meditated in the Punjab, which would limit in a very summary way the power of the ryot to mortgage his land. Legislation of this kind is certain to increase, and to become more drastic in each decade, for the evil must be coped with unless the peasants are permitted to become the serfs of the Banyas.

Lord Ripon said that "if, through rack-renting, or any unsuitable system of collecting rent, or from inability to obtain capital on reasonable terms, the amount of produce becomes less than sufficient to provide the sustenance and appliances required by labour and land, it becomes the imperative duty of the government to ascertain whether any legitimate means can be provided to check the degradation of agriculture, which must otherwise ensue." While therefore giving fee simple with the one hand, the State is changing it into something very like a leasehold, by limitations and taxation on the other hand. This appears to be the trend of development from Ireland to Australia, a certain "nationalisation of the land," or something like it, being everywhere slowly accomplished in much the same way. Even in America, a country which might be considered to be the antithesis of India in every respect, the bulk of the farms of some of the most important States are already mortgaged up to the hilt, the agriculturist is becoming a mere tenant, and labourer for the money-lender, and the new political party now threatening Republican ascendency has for its mainspring the revolt of the cultivators. A similar rural discontent may be noticed asserting itself and demanding a remedy all the world over.

This brings us naturally to the consideration of a still more suggestive State interference in India, that by which advances are made to farmers, whether freeholders or tenants, from the public funds, for the purpose of permanent improvements to their holdings. This is the exact proposition of the new farmers' party in the United States, which has been made more or less crudely during the last ten or fifteen years in Victoria, and may be said to have been now adopted on a small scale by New Zealand, in its village settlements, which appear to have achieved a certain amount of success. Mr. G. W. Cotton, M.L.C., of South Australia, has long identified himself with an agitation for the adoption of the principle, in a limited degree, in connection with the working-men's blocks which have been established chiefly by his exertions in that colony. It is doubtful if any of those who have breached the idea in Australia, had any conception that the system of State aid to farmers was in active operation in any part of the British Empire, and least of all in its great Asiatic Dependency. Yet, as a matter of fact, the practice has been of ancient date, and was fully expressed in the Land Improvement Act, XXVI of 1871, since repealed and amended by No. XIX. of 1883, which applies alike to all the Presidencies. A certain sum is set apart every year in each of them—in Madras and Bombay £20,000 per annum—which is disbursed in loans to individual cultivators, who may even base their claim upon the ground of their distress. In the great bulk of the cases, however, the application is only entertained in order that improvements may be
made upon the holdings. "Improvements" are defined to include "any work which adds to the letting value of land," and it is to be noted that in the indication of these the first place is given to "wells, tanks, and other works for the storage, supply, and distribution of water." Then comes "the preparation of land for irrigation," and next its "drainage, reclamation, protection from floods or erosion"; after this are placed the renewal or reconstruction of the foregoing, and then with a "drag net" conclusion the word is made to embrace all other works which the local governments, with the sanction of the Governor in Council, may declare.

The maximum term of the loan which may be granted to a village, or an individual, is thirty-five years, and provision is made for its summary recovery when necessary. Each presidency makes rules as to the methods of application, inspection, security and repayment. The improvements are not reckoned in the assessed value of the land on which rent is paid, until after a fixed term. In the Panjab and in Bombay, if not elsewhere, advances have been conceded for the purchase of cattle, thus indicating considerable elasticity in the interpretation of the meaning of the word "improvements." They are also permitted for the purchase of seed grain, but in this instance the debt must be repaid in one year, or if incurred for stock, in two years. In the latter case, having an intimate knowledge of the possibilities of Hindu trickery, the Government itself purchases the cattle for its borrowers. Surely the wits of the laissez-faire school had never a better opportunity of exhibiting their cleverness than in the dissertations in which a knowledge of this fact should enable them to indulge. The British Empire may be pictured in the person of its officer, armed with the sanction of a Vicerey, of a Governor and his Council, of an Act of Parliament, and a code of minute regulations, buying buffaloes for the ryots, examining their mouths, making sure that they are sound in wind and limb, and taking special care that the seller is not a friend or relative of the half-naked pagan to whom they are about to lend the few rupees necessary for the purchase. Where is there so paternal a Government as this? Where is there such an approach to the industrial partnership which Socialists glorify?

The steps by which the unhappy Jat, whose cow has died, or whose well has fallen in, betakes himself to the Mont-de-Pitié which the mighty Indian Government manages for his benefit, are few and simple, as becomes the transaction of an illiterate peasant. He makes an application on stamped paper, for which he is required to pay 1s., in order to prevent the shreds of dishonest pleas that would otherwise pour in. Stating his name, profession, parentage, tribe or caste, and residence, he describes exactly what he proposes to do with the money, if he gets it; shews that the expenditure will be reproductive, and specifies the sum he will lay out upon the work from his own resources. If he asks for more than £500, he is required to furnish a rough plan; and if for more than £500, an accurate plan, specification, and estimate. If thought wise, the officer can get these plans prepared for him on payment of a reason-
the State assessment, which might be likened to the municipal rating, the standard adopted for water-supply loans in Victoria, but is usually somewhat higher. Liberal as are the provisions under the Victorian Irrigation Act, and unparalleled colonially, except in South Australia, they are not nearly so favourable as are the conditions under which the Hindus obtain their water supply, and the anxiety necessary to enable them to make the best use of it. This Asiatic despotism after all is kinder than any democracy has yet proved itself to be. Here, as elsewhere, the 

 Chapter XI.

Indian Wheat and Australian Trade.

Food grains have a place apart in all countries, and especially in India, where wheat is the only great article of export in which the country competes with white growers. It is as exchangeable as gold, and therefore as generally sought both east and west. The universal wants of man are food and clothing. Under these heads are included the greater part of the production and commerce of the world. As wheat and wool are two of the principal staples by which these wants are supplied, the Australasian interest in their exchange is paramount. In wool the supremacy of the colonies appears secure, but in wheat supply they are still beginners. The question has been raised already as to whether, for one reason or another, it is worth while for us to endeavour to gain a better place. The answer to be given must depend upon prices, and these in their turn upon our competitors, and upon the permanence of the demand abroad, to meet which our exports are despatched.

Most countries provide their own food. The wheat trade of the world depends upon the deficiency of Western Europe, and practically upon that of Great Britain, where far larger quantities are required, for manufacture as well as for consumption, than its agriculture at present supplies. With a radically reformed land system it would be possible for the mother country to greatly diminish her imports by increasing her home production. Belgium, proportionately as small, and as industrial as Great Britain, contrives to satisfy her own wants, and it is therefore possible to foresee a time when a much nearer approach to a balance between local demand and supply may be established in England. The second cause of European wheat purchases is climatic, and though operating irregularly, is scarcely likely to be coped with for a long time to come. Unfavourable seasons in France, Germany, and England, are not uncommon, and in such emergencies the wants of their dense populations have to be met by importation. The average annual quantity required in London over and above the English crop is about 150,000,000 bushels. It is to supply this demand that alien peoples at the ends of the earth unlock their lands, and despatch their cargoes. The world annually harvests more than 2,000,000,000 bushels, valued at upwards of £400,000,000.
have been too frequently sketched in these pages to require further description. Wheat is a cheap crop, and with cheap land, cheap labour, and cheap transport, the ryot is excellently fitted for growing it. His food, the millets and grams, with his pocket-handkerchief clothing, represent the lowest possible stratum of economical living. If he is without machinery he saves its cost, a pit in the ground serves him for a barn, and if diet depreciates the price of his grain it increases its weight. The keystone of his position as a worker is that with him wheat is always an extra. He lives by and on his summer crops, and can afford to sell the fruit of his winter harvest for what it will fetch. While the productiveness of his land lasts, whatever he gets in this way looks like a profit, since it comes over and above what he has been accustomed to receive. This of itself is sufficient to explain the rapid extension of wheat growing in India.

The total area under wheat in India has been estimated by no less an authority than Professor Robert Wallace as equal to that of the United States. This appears excessive. The probability is that the area is about 30,000,000 acres, of which two-thirds is in the British provinces, and the rest in native states. Something more than one-half of this area is cultivated by ordinary dry farming, chiefly in the central provinces and native states. The opening of the direct railway route between Bombay and Calcutta has helped to enhance export. In 1885 Bombay shipped 467,000 tons, but sent away nearly 200,000 tons in the first four months of 1891, had its granaries and railway yards blocked with piles of bags, and its harbours filled with steamers capable of carrying twice as much more. Nothing like the rush had ever been witnessed before, even in the great port of Western India. There are some millions of acres still available for wheat growing, by dry farming, in Central India, only waiting for population and railways, to become largely productive. Both these wants are likely to be satisfied. The people will steadily flow to them from the many congested villages of the north-west, and the enterprising Government of India shows no signs of relaxing its spirited policy of railway construction, so that a gradual increase in the production from this quarter may be looked to for years to come.

There is, however, another condition to be taken into account besides population and railways, and this is irrigation, which already plays a large part in the production of wheat. Probably 15,000,000 acres of this crop are now artificially watered, and without taking into account what the natives may be able to add by means of new wells and tanks, it is certain that the Government schemes will increase the extent of the wetted lands considerably within the next 10 years. There are 10,000,000 acres under wheat in the Punjab and North-west to-day, while the new schemes in the former, and the great Sarda project in the latter, will probably add another 3,000,000 acres to the irrigated area. The regularity and largeness of the yield from these lands makes them a formidable addition to the Indian total. There is also a considerable acreage
watered in which wheat is not yet grown, but upon which it would
be grown at once if prices were sufficiently tempting. In the two
provinces mentioned the possibilities of wheat are limited only by
the possibilities of irrigation. Probably a considerable portion of
the uncultivated acreage elsewhere would require a system of
water supply to make it permanently productive. The construction
of the required works will demand time as well as money, and
probably not more than 5,000,000 acres, counting Government and
native schemes together, is likely to be added during the present
generation to the irrigated area available for wheat.

There are circumstances to be taken into account on the other side.
The growth of population means an increase of production, if
accompanied by increased cultivation, but it also implies an in-
creased consumption. Wheat raising has brought prosperity to the
Panjab, visible in the gold ornaments of the wives of cultivators,
upon whom formerly nothing but silver was to be seen, and it has
also led to the formation of comparatively luxurious tastes. Wheat,
once only the food of the rich, is now largely eaten by all Sikhs, and
certain to gradually drive the comparatively coarse and poor
millets out of the larder. This, however, is not peculiar to India.
The Russian peasant lives on about the same level, and is too poor
at present to be able to eat the grain he sows and reaps. He is
equally ignorant of threshing machines, and even worse provided
with roads. Any improvement in his position would doubtless lead
to a similar improvement in his food. There are those who contend
that even in America the maximum wheat output has been reached,
and that the rapid multiplication of its citizens will reduce the ex-
portable surplus, though it must be confessed that there is nothing
apparent in the returns to justify such a conclusion. The tendency
of the prosperity of wheat cultivation to increase its local consump-
tion affects poorer communities only.

The rainfall always remains an important factor in India, for it
scarcely affects the fate of the crop to the dry farmer, or to the irrigator who
depends upon an inundation canal, while it may even affect those
under perennial canals, where showers are often relied upon to 

out the purchased supply. There is rarely a plentiful harvest all
over the country, and while the immense shipments from Bombay
had been attracting attention, there were rumours of a probable
famine in Madras. Local deaths of this kind need not necessarily
affect the wheat export, since the deficiency in southern provinces
would probably, save in very extreme cases, be met by imports from
characteristic. The quality of Indian wheat is low, so that it finds its best
market in the south of Europe. Its cleanliness is impaired by care-
lessness in handling, and sometimes by fraudulent additions, so that
5 per cent. allowance for seeds and earth is made upon its parcels.
Considering that the grain has sometimes been grown as a mixed
crop, and always trodden out of the ear upon a mud threshing-floor,
and stored in pits to protect it from weevils, its condition need
occasion no surprise. Elevators are unknown to the natives and
their grain is never graded, so that under these circumstances it
has many disadvantages as compared with first-class American ex-
ports.

Indian wheat is to be regarded as the product of two contrasted
factors—uncivilised production combined with civilised distribution.
It is grown as a savage grows grain, except where irrigation is
employed, for the land is scratched instead of ploughed. The grain is
sown, tended, and reaped by hand, threshed without machinery, as
corn was threshed in the days of Moses, stored as it was stored in
Egypt long before the Pharaohs, and conveyed from the farm in
 rude wagons, often with wheels of solid wood, as simple in con-
struction as the chariots of Homer's heroes. Whenever it reaches
the railway station it passes into the hands of civilised man, to be
sold by telegraph, and transmitted by steam over land and sea to its
place of destination. Owing to the comparative valuelessness of
labour and land in India it is cheap, and therefore becomes a
dangerous rival in markets where white farmers sell their produce.
It is difficult to find a standard of cost from which to determine its
minimum price. The home market in India is readily supplied.
This grain is grown for export, and is sold for what it will fetch, so
that the great bulk of the price is made up of the cost of carriage.

Sea freights are low, and the chief item is the railway charge.
Panjabi wheat is most of it shipped at Karachi, after a run of 800
miles from Lahore. The North-west grain is carried from Cawnpore to Bombay, distance of about 1,000 miles, for less than Is. 6d.
per bushel. Freight hense to London have been as low as 12s. 6d., and as high as 25s. a ton, though the average lies between 16s.
and 20s. The average railway rate for long distances would be
about 1d. per ton per mile, so that the quarter bought in Oudh for
1s. 6d. is landed in London at a little under 32s. This gives a
farmer's price of less than Is. 6d. per bushel, as against Is. 9d.,
the lowest recorded in America. Though the freights and rates from
the States have been halved since 1872, it would be unreasonable to
expect anything like the same reduction in the future. It now
costs two bushels of wheat to get the third bushel from Nebraska
to London. Any future reductions are likely to be in farm prices.
The Indian ryot may even afford to take less than Is. 6d. a bushel
for his grain, but can the American or the Australian?

The problem is greatly complicated at present by the silver
question. This affects Indian production, because, while for purposes
of internal exchange the rupee counts still for 2s., and still buys
labour, land, food, and wheat to that amount in the country, its price
abroad has varied from under 1s. 6d. to 1s. 9d., so that for the lower
sum the English merchant gets 2s. worth of Indian wheat. To
a certain extent, the Russian rouble, also of silver, is similarly
affected, but the United States immense producers of silver, and
having a silver coinage, are considered to suffer, because the dollar,
unlike the rupee, has a diminished purchasing power in its own
country. It is at least remarkable that through all the variations
of price of the last decade the relative values of silver and wheat
have always risen or fallen together. Australia is also a sufferer, for
the cheapness of silver in the meantime operates as a bonus to Indian production generally, and especially to wheat. Besides this handicap the irrigation systems impart a certainty to agriculture which enables the ryot to accept lower prices than if he had to add the losses occasioned by a failure every third or fifth year, and the fact that he grows his food and earns his rent mainly by other crops at another season operates in the same direction. Altogether, he is a competitor worth watching, and if, as appears possible, he raises his area under wheat to 40,000,000 acres, and continues to increase it to 50,000,000, the British Government providing him with railways and irrigation works, he will probably surpass all other exporters to Europe, except the United States, in quantity, though judging by his habits he is unlikely to produce best qualities, or take top prices.

There are still 80,000,000 acres returned as arable, but uncultivated, in India. A considerable portion of this enormous tract will need irrigation to render it productive, and, as we have seen, an increase of 5,000,000 acres in the regularly watered area is as much as can be at present looked for. The additions to dry farming can only be roughly ascertained, though as they depend upon railway extension and migrations, which are never willingly undertaken by the conservative cultivators, it is certain that these also will be gradual. Summing up the prospects, and taking wet and dry farming together, there ought not to be an increase of the export by more than 30 per cent. in the next fifteen years. Its cheapness is to some extent balanced by the higher quality of the Australian product, which will always ensure it a higher price. But what is certain is that the low figure at which the ryots' grain can be placed upon the markets of England, is likely to permanently cripple British agriculture, and that the large margin of untilled Indian land, open for settlement, offers the opportunity for an indefinite though deliberate increase of its exports, which must depress European prices, and discourage white competitors.

The Australian farmer may well ponder the situation at once, and inquire whether it is likely to be profitable to compete with a producer who can take 1s. 6d. a bushel and even less for his grain. To supply the wants of our own continent, and to have a surplus available as to be able to take advantage of a good demand abroad, is no doubt the wisest colonial policy. That wheat growing could or should be restricted at once, for the progress of the Hindus will be slow under any circumstances, while a rise in silver or a war in Asia, might at any moment alter the whole situation. Still, so far as their neglect of civilised standards is concerned, the Russian peasant or the grower in Asia Minor are rivals of the same class, against whom it is almost hopeless for Caucasians on this side of the world to compete. The very size of the export business of the States, and their proximity to the old world, gives them great advantages as against us. Instead of pitting ourselves against such odds, it would undoubtedly be judicious to steadily shift the balance of our cultivation, so as to make the most of the special advantages of position which we possess and they do not. In these only the South American States can hope to challenge our supremacy, and, judging by their recent history, they are not likely to do so for some time to come. The contrast in the seasons of the southern hemisphere gives us our great and singular superiority. It would secure for our farmers a practical monopoly of the markets for dairy products, fresh fruits, and even vegetables in Europe, and Eastern America, at certain times of the year. High prices reign then, and there are absolutely no rivals to be faced. Our people have only themselves to thank if they persist in putting their whole strength into a starvation race with Russians and Hindus, to produce wheat at low prices, while they neglect high-priced products, which the rapid improvements in cool chambers, and in speed of transit, enables them to place upon the northern market in first-class condition. With the cash received from their wheat they can now, if they will, start the creameries, factories, orchards, and canneries, which ought to pay them far better, and by means of irrigation where the seasons are too dry, or the rainfall is uncertain, pay them more regularly than wheat growing as a sole product ever has done, or ever can do. The secret of success for the Australian farmer will be to develop his holding so as to be able, like the ryot, to regard wheat as an extra, and sell it for what it will fetch, without impairing the ordinary income of his farm. This should be derived from spring products grown to meet the demand of the winter markets of the old world. Nature will then be upon our side, and the contest will be with those of our own colour in the markets of our own race.

The last point to be considered in this connection is the prospect of commercial exchange between India and Australia: a question which should be of special interest to those colonial farmers, who are already looking abroad for markets. As yet it must be admitted that the trade between us has been of comparatively little value; art wares on the one side, and perhaps a little saddlery on the other, almost completing the industrial total.

What exchange there is at present is chiefly of rural products, and it is in this direction that there are the best opportunities.

The irrigated fields of India are not likely to increase its exports to Australia. In 1889 Victoria took 24,390 cwt. of wheat from Bombay, but the chief purchases were rice, sugar, tea, jute, castor-oil, yams, coffee, with pepper, spices, and tapioca, from Further India and the Malay Peninsula. Rice and jute are practically the only products of watered fields which we consume, and neither appears to promise a sufficient return to justify its cultivation here, where climatic conditions would permit. Our exports to India are even less agricultural, gold, specie, and horses, completing the list. In 1889 we bought £375,000, and sold £420,000 worth of goods. Out of this, the horse trade alone is of any value to the country districts. Considering our nearness to India, and the fact that our chief European mail lines touch at Ceylon, the fact that our trade amounts to less than £800,000 annually is rather remarkable.
It would be unreasonable to anticipate that we should be able to compete in Bombay with English manufactures, but it does appear extraordinary that we do not take advantage of our seasons to send orchard and other products just across the line. Mr. D. Wilson, the able and indefatigable dairy expert, sent three tins of factory butter through the tropics in my cabin, which were tested in Ceylon about one month, in Lahore and Calcutta about two months after my departure. The first tin was opened by Mr. Ferguson, editor of the Ceylon Observer, whose verdict was that the sample was equal to Danish or Normandy; that he had seldom tasted better, and that it might be taken for fresh. The second was stated by the editor of the Civil and Military Gazette to be excellent, "quite up to the standard of seasoned Danish butter." The third tin was noticed to be palpably defective before being opened—a circumstance that need occasion no surprise since it had been subject to very harsh treatment during a railway journey of over 3,000 miles in addition to its sea voyage. Mr. Blechynden, the Secretary of the Agricultural and Horticultural Society of India, whose headquarters are in Calcutta, opened it before his committee and found the contents quite spoiled.

The remains were afterwards made into capital "Ghi." This native substitute is really butter, boiled and clarified in a liquid state; it is solely employed by the Hindus for all purposes, and largely by Europeans in cookery. It keeps well, but is too tallowy in taste for the palates of white men. When made from buffalo milk it is richer in cream, and stronger in flavour, than from the cow. At least one attempt was made in Victoria to produce "Ghi" for export to India, but the experiment was not attended with success. For one thing the caste difficulty has to be surmounted, since though the average Hindu will cheerfully sell to his brethren a compound defiled by the introduction of beef fat, he will not permit his own salvation by eating it, and the mere fact that butter has been made by European hands is enough in itself to absolutely prohibit it to the purists. (Ghi fetches from 9d. to Is. a pound, but owing to caste prejudices, and the difficulty of hitting the native taste, this enormous market is probably closed to Australian enterprise.

Anglo Indians alone consume butter, and it is to supply their tables that the dairy farmers of the colonies might well devote some attention. It is true that the European population is small, but it can afford to pay for a good article, and my own experience indicates that the climatic conditions are by no means unaccommodating. Good Danish butter kept in ice, and invariably used in tent life, sometimes fetches 3s. a pound in the interior in summer, when a native butter can be had for 1s. Calcutta, Bombay, and Madras, are badly supplied with a local product at all seasons, the better quality being usually found up country, and the best, curiously enough, at Kamchi. There should always be a good but limited market, in these capitals, for the best quality butter, carried in refrigerating chambers and sold at a high price. There should be a large market for a fair butter of even grade, if once our purchasers could obtain an entrance into the Commissariat Department, and supply the large quantities needed for the troops. In this direction there is distinctly a most promising opportunity.

The export might be supplemented to some extent by supplies of milk—always thin and poor in India—for if the concentrated milk, now growing in favour, could be transmitted with sufficient frequency in cool chambers it would be heartily welcomed by well-to-do whites. There appears to be some prospect of obtaining custom from the army also, as Brigade-Surgeon Hamilton and other medical authorities have strongly condemned the present system of barack victualing. A "milk and butter supply" branch of the commissariat has been suggested, the medical officer named having estimated that the cost to the State of enteric fever cases, many of which are attributed to infected milk and butter, in the three regiments stationed at Lucknow, has amounted in five years to £50,000. The price paid for hospital milk by contract with the natives is 5d. per quart, and though no doubt any project for supplying concentrated milk in quantity to India, implies an immense advance on our present methods of preserving and transmitting it, the demand is worth keeping in mind.

The fact that the great centres of white population are practically on the seaboard, must be taken into account in all these matters. With cool storage provided in them, it should be easy to initiate a business in fruit and vegetables. It is probable that the prices paid for good table vegetables in the hot season would more than make up the cost of transit. The potatoes obtainable seem specially poor, English fruits are everywhere stale and tasteless, and though they are beginning to be grown under the Himalayas, in the Kulu Valley, and the Kangra district, there is no extensive local production. Peaches and similar fruits thrive at Peshawur, and the Punjab derives a certain supply from the north, but the coasts and the south would doubtless greedily receive a small, steady, and first-class supply, as luxuries. Bacon, ham, and preserved meats, might be almost a monopoly for Australia. The army requirements alone should demand a constant output. Chilled meat for the tables of white residents ought to command high rates, as its favour would far surpass anything at present obtainable even in winter. In fine, the wants of the white population in dairy produce, fruit, fresh and preserved meats, could be met most readily from Australia, and though the trade would have narrow limits, ought to prove remunerative to our farmers and their agents. Considering that we are but a fortnight distant, and that the country lies upon our main steamship routes, it is somewhat surprising that our exchange is so backward. We need Indian tea, coffee, rice, and jute, and can return from farms and orchards, as well as from mines and stations, what our kinsmen want. The native population are scarcely likely to attract, though there is a great business to be done with them if their caste taboo was once set aside.

If the principle of encouragement to Imperial trade finds favour
in London, there could certainly be no better opportunity for its application than in the purchases made by the Commissariat of India, which are wholly under the control of its Government. A new commerce could be opened up with the colonies by the India Office without tariff alterations, or legislation of any kind. It is for the Australian producer to prove his capacity to supply the necessities of white troops, cheaply and of good quality, and he can then command this market in the long run with or without special assistance.

CHAPTER XII.

IRRIGATION GENERALLY.

The first use of irrigation, probably in the form of natural inundation is unquestionably remote in time. Mr. Buckle's a priori argument as to the influence of the environment upon each particular civilisation, led him to select India as a chief illustration of his theory, and to trace its redundant population, unequal distribution of wealth and power, caste system, and despotic government, to the physical conditions which made rice and millets its popular foods. Since the first of these can rarely be grown without flooding, he might legitimately have taken another step backwards, and have given to irrigation the priority and influence which belong to it in certain climates. It is the chief means of maintaining the teeming life of Southern Asia, in countries where even to-day the individual is lost in the caste, and race itself appears depersonalised.

There is, however, more than sufficient evidence to enable us to dispense with such inferences. The antiquity of irrigation is manifest since it is found in operation among the first nations of whom any record survives. Nature herself may be held to have taught the Egyptians its marvellous possibilities. The Babylonians were their apt pupils; the great plain of the Euphrates by its means maintained a vast population, and to-day its dreary desolation is marked by the ruins of ancient canals. The practice of irrigation in India, and in China, antedates the historical epoch by an indeterminate period. The Greek Magasthenes, ambassador of Seleucos Nikator at the court of Sandrokothos, near Patna, who wrote an account of India 300 years before Christ, says that then "the whole country was under irrigation," and very prosperous because of the double harvests, which by its means the people were enabled to reap each year. There are reservoirs in Ceylon and in Southern India more than 2,000 years old. The Spaniards on their first entrance into Mexico and Peru, found elaborate provision for artificial water supplies which had been employed for many generations, and the origin of which was almost lost even to tradition.

This antique aid to husbandry, found among many peoples and in many parts of the world before the beginning of the years of history, has had a new spirit breathed into it by modern engineering. Its first successes were achieved in Northern Italy during
medieval times and some of those are claimed to have been achieved by the universal genius of Leonardo de Vinci. It has been during the last half of the present century, however, that it has made the most remarkable advance. In Italy a number of canals, notably the Cavour, costing over £2,000,000, the Villoresi, costing £1,500,000, the Casale and the Quintino Sella have been constructed, while in France the Marne, costing £1,600,000, the Verdun, £350,000, the St. Martily, and Bourne, are among the chief works which have enormously increased the area supplied with water during this period. Within the last few years or two Sir Scott Moncrieff has been enabled to put the Nile Barrage in working order, to the great gain of Egyptian agriculture. In the United States there has been an even more astonishing development, and while twenty-five years ago irrigation was regarded as a primitive Indian and Mexican practice, there are to-day tens of millions of dollars invested in land supplied with works for watering it, in a number of the newest States by energetic and enterprising Anglo-Saxons. In fine, to the thoughtful observer, there is no development of agricultural production in the nineteenth century, so striking in the rapidity of its growth, or in the richness of its returns, as that by means of irrigation. Those who endeavour to discourage its adoption in Australia, who indulge in pessimistic predictions of disaster and seek to bolittle what has been already done, should become better acquainted with the progress which it is making abroad.

The expansion of irrigation in India has been much greater of recent years than in any country, except perhaps the United States. The physical conditions of climate and product which, according to Buckle, govern its social and political destinies, have certainly been paramount in dictating this development. The gigantic works undertaken by the Indian Government, and those on a smaller scale reconstructed in Ceylon, were not a speculation in beneficence, but were forced on by the terrible famines which periodically visit portions of this great territory. In every instance these are occasioned by a deficient rainfall, and sometimes the deficiency endures for two or three consecutive years. The population of the continent is so vast, and presses so closely upon the margin of subsistence, that any falling off in the annual food supply is felt at once, and severely. The ryots, or farmers, are able with difficulty, to tide over one bad year, two place them in the greatest straits, and three involve wholesale starvation. Insufficiently nourished, even in the best seasons, the helpless villagers perish by hundreds of thousands at the first keen pinch of absolute want. All India, with the exception of a strip along the Malabar coast, and another belt stretching southward from Assam, and including the head of the Bay of Bengal, is liable to failure of rain, and therefore liable to these catastrophes. The British-India steamer which conveyed me from Colombo to Tuticorin discharged 250 tons of Bengal rice at the latter port, in order to meet a dearth in the neighbouring district of Tinnevelly. Almost every year witnesses a stress of want in one or more parts of the peninsula, and it is fortunate when this can be coped with out of the superabundance obtained in more favoured districts. It is under this horrible pressure of human suffering that the English Government in India has adopted the policy of constructing irrigation works and railways with loan money. They first provide food with certainty every year, while railroads enable their surplus to be conveyed to the starving. Under the many unlooked at which separate India from Australia we may recognize a strong likeness here both as regards the cause and the condition of irrigation enterprises which have been forced upon our attention by the water famines which have cost the lives of millions of sheep and cattle, and the fortunes of thousands of farmers. Both communities have come to the conclusion that it is judicious to pledge the credit of the country, for the funds requisite to mitigate, if not to prevent, further losses of this appalling character in the future. As the need was keen in India, and discovered earlier, it is not surprising that its achievements dwarf, not only those of Australia, but those of the rest of the old World.

The immediate relations between famine and irrigation is perfectly evident in every presidency. The death in Madras in the early part of the present century lead to the construction of the asientos which supply its deltas, that of 1837-38 in Bengal induced the preparation of the project for the Ghanges Canal; that of 1859-60 in the North-West Provinces determined the State to undertake all future works, so that in 1867-68 Lord Lawrence definitely inaugurated what is known as the policy of Extraordinary Public Works. Altogether there were seven severe famines in Southern India in the first seventy years of this century, all disastrous within varying limits. The terrible famine of 1876-77-78, for which a large relief fund was generously raised throughout Australia, marked the culmination of these awful visitations, 5,250,000 persons dying in the lingering agonies of starvation, although the Government lavished £11,000,000 in relief. The indirect losses occasioned would render this hideous total more imposing still. It was evident that to cope with evils of this magnitude the preventive measures must be upon a similar scale, and in spite of the fact that India has had to bear the cost of three wars and a portion of the cost of a fourth since that date, her rulers have devoted themselves to the task with a courage and energy which are worthy of the occasion. If the British in India had achieved nothing else, the public works policy of the past twenty-five years would fully justify their supremacy.

Prior to 1851 all irrigation works were constructed under a military board by military engineers, and paid for out of revenue as part of the ordinary service of each year. It is difficult, if not impossible, to ascertain the exact outlay upon particular schemes, or indeed upon the whole of them up to that time. Broadly the expenditure of loan money now exceeds £33,000,000, reckoning the rupee at 2s., and taken as a whole the works pay interest on that sum. The original estimate was that only £30,000,000 would be required, but since then new schemes have been ordered, some of
them authorised, and some are at present in course of construction. The railways have had nearly eight times as much money invested in them, either by the State or upon its guarantee, and though they are now paying 5 per cent. interest upon the capital sunk in their construction, have £39,000,000 to make up if they are to recoup the losses of earlier years. The situation in India from the financial standpoint merits the consideration of Australians, since the colonies have embarked upon a similar policy, and most of them are likely to push it farther in the future.

The one Australian colony which has commenced to encourage irrigation is Victoria whose watered area was 3,000 acres in 1888, and reached 25,000 acres in the following year, which happened to be dry. This is less than in the little Indian State of Ajmere, and less than the vineyards and orchards around Fresno in Southern California. It will be many years before Australia as a whole can hope to rival the smallest of the Presidencies, or the least progressive of the irrigating States in Western America.

The statistics available are as yet partial, sometimes conflicting, and require to be taken with that knowledge. So far as can be determined, the position as is follows in 1890:

<table>
<thead>
<tr>
<th>Country</th>
<th>Acres Irrigated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria</td>
<td>25,000</td>
</tr>
<tr>
<td>Ceylon</td>
<td>100,000</td>
</tr>
<tr>
<td>France</td>
<td>400,000</td>
</tr>
<tr>
<td>Spain</td>
<td>700,000</td>
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<tr>
<td>Italy</td>
<td>3,750,000</td>
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<tr>
<td>Egypt</td>
<td>5,000,000</td>
</tr>
<tr>
<td>United States</td>
<td>7,500,000</td>
</tr>
<tr>
<td>India</td>
<td>30,000,000</td>
</tr>
</tbody>
</table>

It is doubtful if the acreage calculated for the United States can be unreservedly accepted. It probably includes large areas commanded and capable of being watered. The Senate committee look forward to a time when 100,000,000 acres will be irrigated in the United States, by people of the same stock as ourselves, who live under conditions closely resembling our own. With these figures before us, can it be said that Victoria or Australia has exhibited any undue haste in fostering this enterprise?

In India, cultivation and irrigation are both upon the greatest scale. Its agriculturists vastly more than equal in number the whole population of Canada, the United States, and Mexico, added together, while those who live by irrigation are more in numbers than the whole of the farmers and farm labourers of the same countries engaged in wet and dry farming together. India has four times as large an area irrigated as there is irrigated in North America; its canals exceed all others in length and capacity; its methods and its products are more varied; its yield more valuable than that harvested in any other country, and India thus maintains a denser population than any equal tract of the earth's surface of which we have trustworthy information. In every aspect, therefore, it may be entitled the first irrigation country in the world.

What then can it teach us? Viewing the subject in its most general aspect, irrigation may be broadly divided into two parts: the work of the engineer who makes water available, and of the cultivator who employs it upon his fields. To succeed with his project the designing officer requires some knowledge of the cultivation to which he ministers, and the farmer some knowledge of rudimentary hydraulics to govern his water when he gets it. The title "agricultural engineering" has been applied to the task of the professional man, and that of "engineering agriculture" might be adopted with little less appropriateness to the farmer's share of the work. That there is an art of irrigation is evident upon the most cursory observation of its practices in any part of the world. The conditions under which water should be artificially applied need to be varied with judgment, chosen with nicety, and determined by a knowledge, at once comprehensive and accurate, of all the factors of the case. There are some general rules of universal applicability to irrigation everywhere, but they are relatively few and vague. The solution needs to be worked out in each separate instance, just as every customer's account must be made out by itself in a tradesman's books. What amount of water should be given, in how many instalments, and at what junctures, depends inter alia upon crop, soil, climate, rainfall, the season, and the particular quality of the product which it is desired to develop to make it most marketable. What light, it will be asked, does Indian experience cast upon these issues so far as they are likely to face the Australian farmer?

To visitors who have had no previous acquaintance with irrigation, the ryot might teach a great deal, but he has little to impart to those who have added to some practical experience in the colonies a general knowledge of American and Continental practices. The lessons of the danger of over-watering, of the necessity for adequate drainage, of the value of unremitting cultivation, following, fertilising, and rotation of crops, all of which might be acquired in the Punjab, will bear much repetition and continuous illustration, but it cannot be claimed that, except by way of reinforcing previous lessons, there is much else to be learned from a study of Hindoo farming. There is a possibility that to the general reader the repetition of warnings on these heads may have become trite and commonplace, but nevertheless, the manner in which writers for agricultural journals still find it necessary to repeat them, is an evidence that, often as attention has been called to them, these simple principles are still ignored in many countries. They are not yet universally mastered in India. In all newly watered districts, in all presidencies, crops can be seen which have been injured or destroyed by untimely and excessive soaking. In some older districts patches of snow white reb, or deserted stretches of sodden and marshy land, growing only coarse reedy grass or semi-aquatic plants, tell their own tale of neglected drainage. The surprise felt that crops are as good as one sees them to be in the North-West Provinces is lessened when one notes that every weed has been scrupulously removed by hand, and the ground as carefully gone over as if it
Irrigated India.

were a kitchen garden; that the plot is only cultivated once in three years, often ploughed while lying fallow, enriched so far as the owner's means will allow, and a certain traditional round of cropping strictly observed. So far as the cultivators succeed, it is because they obey those fundamental principles of agriculture which are true everywhere, applicable with but minor modifications in every country under the sun, and not in any way peculiar to the great Asiatic peninsula.

Between the Hindu and the European there is always, and in everything, a great gulf fixed. This is true even in regard to the minutiae of irrigation. Uncommunicative, or meditative, to the stranger who speaks his language, and distrustful of the Government officer who is almost the only white he sees, only a portion of whatever knowledge there may be in the native farmer finds its way into print. Still, revenue collectors and assessors, assisted by the agricultural and irrigation departments, attain an insight into his practices and their results, which is sufficient for all practical purposes. Indeed, very little observation is required to give a fair acquaintance with the methods employed in the little holdings, from which many millions wring their bread, or to assure the inquirer that there is nothing esoteric in the tillage and watering practiced north or south.

Many fairly competent critics consider the Hindu an expert irrigator in districts in which the practice is more than thirty years old, as well as a competent farmer, and this is undoubtedly true, if the one great qualification be added, that the expertness is the best attainable by a labourer without capital, implements, or machinery. Remembering the part that these play in modern farming, the severity of the limitation imposed by their exclusion will be rightly estimated. A moment's reflection will show how unreasonable it would be to cherish large expectations of enlightenment in the art of irrigation at the hands of the varied Hindu races in their several stages of civilization, who, whatever their intellectual achievements in other spheres and in other ages, have never paid attention to the applied sciences, and have remained from the days of Manu down to the present time, dependent upon agriculture which is but one remove from savagery. The Aztecs under Montezuma were, and the Red Indians of the Southern States of Western America, or the Fijians and Samoans in the South Seas are, as advanced in their systems of cultivation as the bulk of the Hindus to-day. With a philosophy that has amazed Europe, a poetry that has outshone that of all Asiatic peoples except the Hebrew, an architecture without a rival in its own style, and hand-bom manufactures whose quality surpasses that of the finest machinery in the best factories in the world, its farming has remained in an Egyptian stage, and in Egyptian darkness, so far as modern science or modern implements are concerned. In the refinements of metaphysics, the Hindus forestalled the nineteenth century, while in their agriculture they have remained in the condition of primitive man.

Squatted upon his hams, clad in a waistcloth, and often without vest or turban, the Hindu peasant bends above his irrigating channel, and repairs its breaches with deft and even hand. The many channels which diverge from the hole out of which he either bales his water, or, if it be deeper, raises it by a pole and counterpoise, or draws it by bullocks, are often built up a foot or 18 inches, and sometimes more, out of the stiff soil. Upon these narrow rilles little rills of water are carried to all parts of the field. The whole of them appear to have been built by the almost unassisted hand, as archers make mud pies. The tool for directing the water is but a piece of stick, and thus the whole of the watering is provided and managed by the ryot's palms and fingers and those of his wife and family. The burnet, sharp-pointed staff and cross branch, which compose his plough, with an old dish-shaped basket or two for removing the soil, and a chopping hoe, comprise the whole of his working plant for cultivation and irrigation. He will stand up to his knees in water all day among his rice fields, and toil the whole twelve months through for a bare subsistence, but he will be very loth to try a new experiment, will never make a purchase, except on extenuity, either of an improved seed or implement, and will cling to traditional ways so long as he can find the slightest pretext for justifying them. There is but one word for his style of work, and that is "slovenly." His dams of stake and rice-straw generally leak, and occasionally give way, but he will probably build the next on exactly the same plan, and there is never any attempt at finish in any of his contrivances. The hardness of his lot and the meagerness of his opportunities no doubt largely account for these failings, but certainly the same conditions prevent him from idleness. He almost lives in his fields, will cheerfully receive and distribute his share of water all night, if need be, will watch the trickling supply with inexhaustible patience, and guide it with a dexterity born of long experience. Here his part in the irrigation begins and ends. Whence and how the supply came to him, or where his drainage will flow are matters in which he exhibits not the faintest concern. A timid, industrious, inoffensive, domestic, gossiping hind, he exists mentally in as narrow a plot as his little horizon everywhere bounded by extravagent legend, absurd superstition, and implacable fears. Living in abject poverty, material and intellectual, the little cunning he has acquired in dealing with his crops pertains solely to the state of nature in which he lives and works.

Except in the spring harvests of the north, the products of India are not those of Australia. It is not therefore to such a school that our farmers are likely to look for lessons in field irrigation. For that, now and always, until our own experiences are completely organised, we shall look eastward to our countrymen on the great inner uplands of the Rockies and prairies beyond, and on the lowlands nearer the Pacific, fed by streams from the Sierras. There, arts, inquisitive, intelligent, restless and inventive and progressive Americans, multiplying their machines and devices every year, bringing to their aid all the resources of scientific discovery, and to their
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management the keenest commercial spirit, are likely to be our
masters in this regard for a long time to come. The stalwart new,
high-bred, Garibaldi-shirted, with wide-brimmed hat and ung-
handed spectacle, upright, courageous, thoughtful, self-
relenting, and well-mannered, who may be seen in the orange groves
of Los Angeles or Pasadena, are of a type to which we may turn
with confidence, and which we may hope to acclimatise on our own
shores. The Hindu who irrigates is comparatively about 2,000
years in the rear.

In the other branch of irrigation, which includes the construc-
tion and maintenance of main works, India is as much in advance,
as she is behind in its agricultural application. The student of
hydraulics will look in vain for her rival, save in schemes of town
supply, where the great cities of the Union, and especially New
York, have grappled with colossal undertakings. The irrigation
engineering of the United States is child's play so far, when
measured with that of even the least successful of the presidencies,
with the single exception of the Bear Valley system, in California,
now commanding 20,000 acres, but intended when completed to
water 500,000 acres, from a reservoir nearly twice as large as the
proposed Waronga storage. The Italian canals are now most ad-
mirably designed and efficiently managed, but cannot bear the com-
parison any more than the American. Egypt has still the largest
canal, and in the Barrage perhaps the largest single structure of a
high type, but for all that is surpassed in both size and quality of
works by the Punjab, the North-West Provinces, and Madras.
India has run the whole gamut of irrigation works, and is there-
fore incomparably superior, as an engineering school in connection
with irrigation, to any country in the world. The colonies as yet
can show nothing to compare with any of its schemes. Taking
Bombay alone our Yan Yen or Prospect embankments are dwarfed
by that at Ekruck, not to mention a recent famine relief work at
Asmela, where an earthen dam has been built 90 feet high, and 3
miles long, to carry 80 feet of water, with an escape over a rocky
ridge 4 miles distant; while the Goulburn weir, great and massive
as it is, would scarce make a section of either Khadakvasa or
Tamsa. It will be many years before Australia altogether can
show as many acres irrigated as does that one strip of Western India.

Every variety of major and minor hydraulic structure is to be
found somewhere in India, almost every river and storage difficulty
has been faced, all classes of soil worked upon, and the dangers of
damage in flood or loss in seepage alike confronted. There is a body
of experience in works not yet put into type, but which if described
and interpreted by competent critics, would furnish a far more ex-
haustive treatise on irrigation engineering than any now in
existence. These pages, written by a layman, make no preten-
sion to attempt this task. They merely indicate that it exists,
and sketch, in a popular way, some of the more striking features of one of the greatest enterprises that the British
Government has undertaken in any part of the world. The

admirable book by Baird Smith, now thirty years old, Mr.
Buckley's summary, ten years old, a most interesting paper by
Mr. Breerton, of the same date, Jackson's compilations, five years
old, a remarkably comprehensive essay by Mr. J. T. Baure, read
before the Victorian Irrigation Conference of last year, and Mr.
Nicholls's graphic little treatise, comprise the literature upon a
subject, partially dealt with no doubt by Sir George Cleanney and
General Strachey in a general way, but nowhere even roughly out-
lined in its past history or present development. It is worthy of
the amplest and most elaborate study in all aspects and in all
details. What is needed is a succinct history of each scheme,
describing and explaining all its failures and all its successes, and
depicting its present condition in a clear and forcible way. These
should then be grouped into systems, their likenesses and
differences noted, and the principles which they illustrate set forth,
as that even laymen might read and understand, while professional
men would acquire fresh evidence and suggestions for new develop-
ments of their work. An opportunity remains for the writing,
by a competent literary man and engineer, of a book which would be
a manual of construction for many years to come, of the greatest value
to the colonics. If complete, it would at the same time offer to the
outer world, the best justification for British supremacy in India,
and the best evidence, from facts and actions, of the large minded
generosity and courage of its rule.

It is comforting to note that the adverse conditions which obtain
in Australia have not proved an insurmountable barrier to success
where they have been met with in India. The Goulburn has been
carried, and the Loddon likewise, by our own engineers, some of
whom have had experience in the Presidencies, and there is nothing
disquieting in the prospect that the Commonwealth may some day
undertake the locking of the Murray, and the Darling, or that
diversions will be sought from the Clarence, Richmond, or Nepean.
A skill which has dealt with the Ganges, the Indus, and their
tributaries will certainly suffice to control the wildest of our
streams. The absence of foundations, and the presence of treacher-
os banks, have been overcome by our own countrymen in Asia
upon torrents whose floods descend with tropical rapidity and
violence, and in country to which materials had to be brought by
long railway journeys. So far, the efforts to obtain an artesian
supply have proved as fruitless as those of Victoria. Canals have
been carried for distances as great as any which we shall require to
construct, through districts where climate and characteristics have
been most unfavourable for cheap or expeditious work. The surface
canals, much favoured by the late Mr. M'Coll, and the possibility
of the maintenance of which was denied by his critics, were in
existence when twenty days' journey of water at the time. Large
bodies of water have been carried in channels whose bed consisted of the
natural surface of the ground, untouched except where ploughed
under the banks, which were made from soil obtained by parallel
excavations on each side, just on the plan obtained. But
further than this, canals of great size have been made and maintained upon the crest of artificial banks on precisely the lines adopted by Mr. Stuart Murray. It is true that neither of these expedients is employed except in cases of necessity, but the same statement is true of every other type of construction. Indian experience is wide, and its devices are numerous; no one of its schemes exactly resembles another, and even the best of its works would require amendment before it would be perfectly adapted to Australian use. Not only can India furnish us with models, but also with the knowledge of how to use and vary them, though this is not yet as ready to hand in print as it might be. To unravel all the conditions of the works would occupy a long time; the most prominent and obvious have been outlined in a casual way already. The cardinal conclusion to be drawn by way of summary is that they afford general solutions of all the difficulties of construction which we are likely to encounter in these colonies. By their light our professional men should be able to store, digest, and convey our water supplies with the maximum of safety, and the minimum of outlay.

The question of cost does not admit of comparison, for whether in field work, in the execution of a scheme, or in its maintenance, the cheap labour of India affects it at every turn. Not that the gain is so great as it looks; the superior skill, energy, and intelligence of the white labourer contributing a formidable element of value on the other side; but nevertheless the inexpensiveness of both earthwork and masonry makes itself felt in all the totals. Against the low wages of the tribes of minor officials connected with certain employments. This in a sense includes our whole population, for the question is one that must be dealt with in the Australian Parliaments, and it is a matter of extreme moment that our representatives should be familiar with the history of the successes and failures of British engineers in similar enterprises.

The Australian elector nowadays is a member of a court of appeal to which all kinds of questions are submitted for decision; irrigation expenditure will be discussed many a time during the next twenty or thirty years, and it therefore becomes a subject of which a certain knowledge is bound to be of use. The value of this book is of course diminished by the writer's want of technical knowledge, and by the fact, which has affected both its style and substance that its contents made their appearance simultaneously in the columns of the daily and weekly press of the capitals of three colonies. On the general history, finance, position, and prospects of the great Government schemes the succeeding chapters are at least accurate and fairly complete. No publication is known to the writer having the same end in view. His obligations to existing literature are freely acknowledged, and it would afford him unalloyed satisfaction if some better qualified person would devote to the irrigation of India the prolonged investigation and expert exposition which it deserves. The debt of obligation which the country is under to the British Government, and the British Government to its engineers, will otherwise never be known or estimated, as it probably will never be discharged.
The position of the chief irrigation schemes alluded to can be found by reference to the accompanying map. For statistics generally, and for a comprehensive, though rough, outline of what they have done and are doing for the different provinces, those interested are referred to the appendices. A series of typical works will first be passed in review, in order to convey in a less formal manner, to the general reader, some conception of the scale and character of the great hydraulic achievements of our countrymen, and the conclusions to be drawn from their experience. Those who bear in mind the differences of climate and circumstances which exist between the Presidencies, and their component parts, will need no further caution in that regard, although these descriptions of particular enterprises may assist at the same time to impress upon them the divergencies in connection with irrigation, which reflect the physical heterogeneity of the peninsula, warning us once more of contrasts in the capacities, customs, and creeds, of its peoples, that need to be continually recalled to mind.

CHAPTER XIII.

THE KÁVERI SCHEME.

The magnitude of the operations of the Irrigation Departments of India compels their critic to deal in digests and summaries, in the endeavour to convey an adequate idea of the scale upon which they cope with the deficiencies of Nature, and supply the wants of one district from the superfluities of distant hills. One must always face a danger in such epitomes that the figures given cease to have a meaning except to men trained to their use in this particular connection. A further difficulty is, that unless he be repeatedly reminded of the local conditions and surroundings of European enterprises in Asia, there is an almost irresistible tendency on the part of the reader to unconsciously substitute as a background the circumstances of his own country, and by the inevitable association of ideas to interpret, more or less consistently, the achievements of which he is given a bare outline by his own experience. He thus insensibly essays to measure them by standards which are only applicable in an Anglo-Saxon community. To obviate this it is necessary to introduce here and there as tersely as possible a few descriptive passages, which may to some extent prevent or mitigate the misconception, by keeping the foreign element in view, and by glimpses of detail suggest a complete conception of the truth. It appears appropriate, therefore, to give a sketch of some tours of inspection, from which the condensations and statistical reviews may be better understood.

The nature of the irrigation works in the Madras Presidency, and their historic development, are best illustrated in the great Káveri scheme, which supplies a delta stretching from above the town of Trichinopoli to the sea. The chief systems of southern India are all on the east coast, all deltaic, all modern adaptations of ancient designs, and all make river waters available by the same class of works. Any one of them will serve as a key to the rest, and this particular scheme, as the largest and most profitable, is naturally selected to indicate the type.

The town of Trichinopoli, still the second in the Madras Presidency, would probably never have existed but for the great rock rising in its midst 273 feet sheer, and constituting an inland
breaks the monotony, or betrays the presence of life, although one beholds miles of sterility, spread away, blank, gasping, gaunt, and withered, to where purple mists enshroud the snowfields and majestic peaks of the Himalayas.

Out of those far off mountain out by this thirsty spectre hand come the thin streams of water, which are now filtered into the canal, to carry its bounties of harvest for scores of miles into country almost as unprofitable as this. But in a few months there will be no longer this empty valley, and this quietness of air through which the voices of the Changra on the weir make a faint murmur. That great reef will then be hid in foam, when the flood tide, spreading from bank to bank, and hoarsely roaring, will sweep down 12 feet to 16 feet deep, half a mile wide, shifting its quicksands and shingle beds from side to side, as a porter shifts his load, tossing its tangle of trees, grinding its ranks of boulders against the stubborn mass of stone and iron that will bar its way. In that season of over-abundance, as in the season of drought, the works will fulfil their duty to the far off thirsty plains, and the busy thousands, who wait with confidence under the blazing sun for the trickle to their perishing fields of grain. In the heat and in the storm the engineers will stand to their posts, and flinch from no contest with flood, fever, or famine, or with the river which they master (as their Government masters this people), to prevent the ruin which must certainly follow if its great subject forces should ever master them.

CHAPTER XIX.

INDIAN IRRIGATION.

Having now glanced at the chief typical works of Indian irrigation, we can perhaps afford to remit to appendices the fuller account of the many and various schemes in the several Presidencies, of present magnitude, and future prospects, and proceed at once to sum up, in a cursory way, the results of Indian professional experience, and the duties of Indian irrigation engineers. Nowadays, before any scheme is sanctioned, the country is carefully levelled with close sections close together, so as to admit of the utmost accuracy in estimates, and also to ensure the choice of the highest land for the main canal, the branches and the distributaries, all of which are carried as far as possible along the ridges of the country, to which the alignment is adapted as closely as possible. So strongly is this insisted upon that £40,000 is being spent in the Panjah in altering the lines of channels adopted only a few years since. Every effort is made to study what may be termed the habits of a river, and to adapt works to them as far as possible instead of endeavouring to force it into a preconceived plan. The weir across the Satlaj, for instance, was built bit by bit, in order that the changes in the river which resulted might be examined, and taken advantage of wherever opportunity offered. The ideal of Indian engineers for perennial river canals is the establishment for head works at the highest possible level, with an outlet immediately adjoining the inlet, and some feet lower, so as to obtain a powerful scour across the face of the inlet. Another escape a few miles down with a second regulator is a desideratum, so that the entrance of the canal can be readily and cheaply cleared.

Below this the aim is to maintain the high level as long as possible, disposing of the surplus fall by vertical drops into masonry siphons, opposing a cushion ten feet or twelve feet deep to the current, and with an upward slope from them along the canal. Rapids would only be employed in quicksands, and when boulders were to hand. Side drainages have to be dealt with by means of siphons, superpassages, crossings, or aqueducts, as the case may require, while the smaller are taken into the canal, which then of course demands extra escapes below. An even fall of one foot in 8,000 is preferred, but this is varied in some degree, according to the bed soil, the velocity over gravel and clay being safely four feet a second, while over loose three
feet is the maximum, and over sand much less than that. Where
the canal has to be carried with its bed above the level of the
country, a masonry core wall would be inserted in each bank. Paddle
walls are not in much favour, as it may be thought that the whole of a dam
ought to be a paddle wall. No irrigation is permitted from the
channel itself, from which all outlets ought to be of masonry. The
branches are given a greater fall, of about one in 5,000, and the aim,
is, if possible, to get the channel five feet deep, two feet below the
surface of the land and three feet above it. The outlets upon it
are also masonry, and a few escapes are provided.

The silt borne which forms on the side of the stream is regu­
larly cut, and the deposit annually removed. Weeds are de­
stroyed by means of silty water, if the fall is too slight for the
current to keep them down, but they rarely flourish in a stream
over two feet a second in velocity. On the distributaries the fall is
again increased to one in 3,000, or one in 4,000, with a rapid incline
at the fall into a natural watercourse or river bed if possible. A
great dislike is manifested to dealing with water in driblets, even
in the distributaries, and a “full head” is always sought for. When
a branch does not convey a sufficient quantity to fill all the distribu­
taries full, what is called “tatteling” is introduced, which means
that the flow is concentrated upon one or more of them so as to allow
of a good stream being discharged into the village channels, and
thus the branches are filled in their order. One object of this is to
avoid the percolation, which tends to increase relatively with a small
supply. Large losses from seepage are admitted on all the Indian
canals, though as yet the returns are not complete enough to enable
the matter to be thoroughly investigated. From one-fourth to one-
third of the intake is often missed in the main canal, and sometimes
twenty per cent. to thirty per cent. in the distributaries, so that it
is safe to say that fifty per cent. of the intake disappears before it
goes into the village channels, or at all events upon the fields.

An Indian engineer lives for half of the year at least in camp, or
along his canals, while the executive staff, except for brief holiday
intervals, never leave them. The chief officer of a Presidency,
making a periodical tour of his district in the cool weather, is no
small personage, and maintains his rank by a fitting equipage.
When Colonel Ottley leaves Lahore for the inundation cuts on the
borders, he marches with a train of 70 camels, and horses in great
number. The camp, like a little settlement, with its street of
white tents, well furnished for all purposes, one for office work, an­
other for eating, a third for sleeping, and a fourth for the reception
of distinguished visitors, as well as those of the assistant engineers,
sub-officers, native overseers, servants and under servants of all
classes, is struck after breakfast and disappears on camels in the
distance—a long line of huge humps upon many legs. The day’s
inspection follows its route, and the staff meet again towards even­
ing to find the same camp ready pitched in another spot, fires lighted,
and meals set, the whole transferred as if by magic to the same
position and to the same order as in the morning, even the little
articles or papers being found lying, as left, on the same spot, in the
same tent. The picnic character of these expeditions is the brightest
spot in the year’s duties.

There are many respects in which the successful officer requires
more than strictly professional qualifications to attain his end, par­
ticularly when brought into direct contact with the ryots as con­
tributors to a scheme. When for instance, dak labour is employed,
as described by Colonel Grey, the whole village requires to be marched
out en masse, with drums beating, in order to give the people spirit
and ensure their presence on the work. Grey boards look on and
cheer the labourers, young lads and girls carry baskets of earth,
some women cook, others bear burdens, while the children get in
everybody’s way. Fruit and cheap refreshments are distributed.

When a breach has to be stopped the whole strength of the party
is put forth. They are divided into bodies with distinct lines of
march, everything is prepared ready to hand; poles are poised,
gabions loaded, brushwood stacked in piles, mats stretched and bags
of sand ranged in order, until at the signal the whole swarm pounce
upon them and carry them down in a sudden silence, broken only
by the order of command and the fitful beating of drums. Poles
are thrust deep in the bed, gabions tipped over against them, brush­
wood flung across, mats spread, bags of sand tossed upon them,
baskets of earth quickly follow, until amid the frenzied thrashing
of drums, the whole crowd precipitating itself upon the spot, the
hurd rises and is strengthened until it stands the full strain of the
stream, amid exultant shouts of applause and improvised dances of
triumph. In the evening there are a few fireworks, a little feasting
and a few presents, and then the community drifts off under the
starlight, proud of its achievement, indifferent to its sacrifice
of time and labour for a common good, and on excellent terms with
the engineer subah who has diplomatically secured this con­
tribution towards his season’s plan. To distribute such tasks
fairly, and to secure their prompt performance by a series of scat­
tered villages, is no easy matter. Organisations of this rude kind
are rarely required in connection with major schemes, or those of
which the Government is proprietor, but duties of the same nature
do devolve more or less upon all executive officers in all systems.

To devise, amend, and supervise a great irrigation scheme involves
gigantic responsibilities. The greater canals are marked off into
divisions, in each of which is placed an executive engineer, with
one or two resident European assistants and a staff of natives. The
smallest division on the Sirhind embraces the headworks, 1,000
miles of channel, and 250,000 irrigated acres. The ruler of such a
territory is more powerful than a Rajah, and has far more important
duties. The head of a circle embracing one or more schemes is
like the commander in chief of an army, who controls the campaign
as a whole, but the executive engineers are the generals in
independent command, upon whose individual initiative and capacity
the fate of each battle usually depends. Their great antagonist is
the river, whom they are obliged to treat as the Viceroys does many

...
of the semi-independent races on the borders, equally fickle, equally blind in their fury, whom he is bound at the same time to subdue and use. It is even advisable to permit a certain freedom of movement and accept a certain risk, preparing for the periodic risings, which are certain to come. With such a foe, strife is merely suspended and never concluded, though the time, place, or manner of the intermittent outbreaks can never be quite foreseen. The customary relation between the two is one of armed truce.

Ordinarily the river is employed as an agent of peaceful husbandry, but a sleepless watch is maintained on its movements, and the least change is at once made known, while the engineer is always on the qui vive and ready for the inevitable war at any moment. All canals are supplied with wires and telegraph stations, which are in constant use, for the river is never the same hour, and the perception of its variable gifts has to be exactly regulated according to the variable draws on the distributaries at the other extremity of the scheme. Even in ordinary seasons the engineer has no light task, for his first telegram reaches him at six o'clock in the morning, and during the day 20 gauge cards and 15 more telegrams have to be read, tabulated and studied, so as to keep his balance of water neither too high nor too low for the wants of the thousands of ryots, whose requests for a supply follow the changes of the clouds or their caprices, and cease altogether, or come pouring in all at once. When, however, the gauges vary by the tenth of a foot in the hour, the engineer abandons his rest, and all night the tick-tick of the telegraph is heard in his office, as reports rush in and orders are sent out in rapid succession.

The enemy is subtle and treacherous, and if there is a weak spot in the defences may be surely trusted to find it. Other branches of engineering admit of some latitude, and even of errors, without disaster. Thus a mistake of 10 feet in 100 miles of railway levels was recently detected in Bengal, though no injury had resulted from the blunder. With water the mistake would at least have been registered with the utmost nicety to the fraction of an inch the first day the canal was opened. If there be a spot in an embankment which has been scraped or neglected, water will infallibly discover and take advantage of it. When rain begins the canal supply is at once brought in hand, and for every inch registered the intake is dropped so as to lower the intake a little more than an inch. The closing and opening both require to be very gradual, and, not as the uninitiated might suppose, rendered as simple as turning on or off a tap in a bathroom. If the supply were suddenly shut out, the bank or side crust of silt along all the banks, and probably the little tow-paths just above it, would all fall in for miles, and occasion immense damage. Something like this was experienced on the Goulburn when the river was first hanked up by the weir. Three inches an hour is the quickest fall allowed to the Nihial, until it comes down to two feet in depth, when it can be closed at once. The admission must be governed just as cautiously.

and hence the need of looking ahead and interpreting with the slightest variations in the stream. The Ravi River, with its fall of 27 feet a mile, might be almost dry at evening, and a raging torrent feet deep and hundreds of yards wide before midnight.

Unceasing vigilance is maintained, therefore, night and day far up in the hills, where the thunderstorm is breaking, and far away on the thirsty plain, where the ryots, who have been clamouring for a full supply, suddenly drop all demands at sight of the coming shower. All the burden of their harvests, and sometimes of their lives, rests upon the shoulders of the executive engineer, who must have been wise in his design, keen in his inspection during construction, far seeing in his provision for the crisis, and calm and collected when it comes. When the storm has burst and the river is up in its wrath, charging upon the works, fresh torrents leaping down from the mountains to the encounter, the country under water, and the panic-stricken people flying for shelter to the high ground, the engineer must stand his ground, see that all gates are closed and all escapes open, and that gangs of men are ready to hand with crates, and timber, and branches at any threatened point. He has an enemy to resist, fiercer, bolder, and more relentless than any human antagonist—the sullen and leaden skies pouring down their thousands of tons of water; the earth riven before it, giving it free passage to the spot where the structure reared by human ingenuity seeks to withstand its wild and desperate charge.

In northern India the engineer is a ruler of men; to him are directed the manifold complaints of irrigators, and the appeals in village disputes; into his hand pour complaints against his subordinates, reports of his officials on petty contractors and labourers, and the thousand and one pleases by which all alike seek to make the State their prey. 'The great secret in a canal, as indeed in Indian administration,' says an Irrigation Manual, 'is personal government. With Government officers sympathising and in contact with the people, while at the same time resolved on seeing justice done to the Government which employs them, almost any system can be worked successfully.' Another paper issued to officers lays it down that the hearty co-operation of the leading natives is first to be secured, and next, that 'till subordinates are trained it is absolutely necessary that the officer should see to everything himself. . . .

Till experience is acquired, he must . . . select the lines, give the designs on the surveys, check the calculations, lay out the work, arrange its distribution, supervise its performance. . . . Gradually the task will become lighter, but throughout the secret of success is in the master's eye.' This, it will be confessed, is in itself no light obligation, and this is but a part of a great whole.

Out of this endless tangle of complications, dealing with many castes and races, each in its own way, and doing rough and ready justice as he goes among his subject people, most of them willing to corrupt or be corrupted, the engineer emerges into another atmosphere, in which it is necessary for him to address himself to the task of obtaining the sanction of his superiors at a distance to the
reforms and reforms he desires, while explaining to their satisfaction every hitch or change in his domain. The excellence of the administration upon these canals is as marvellous as government in general is marvellous in India, so cumbrous does the machinery appear, so foreign to the people for whom it is kept in motion, and so burdensome to those charged with its control. And then the professional tasks of the engineer are never over. To repeat a similar employed before, a canal is a living thing, which is always changing, or becoming liable to change, and upon which invisible alternations accumulate until they become visible in a catastrophe. Checking and rechecking of intake, output, sitting, flow, loss, drainage, and velocity, proceed day after day, and month after month, with calculation and re-calculation of the strain upon works, and methods of meeting them, as new conditions arise.

Add to this the diplomatic dealing with native notabilities, and perhaps independent princes, villages crammed with ignorant peasants, townships plentifully endowed with faggers, a host of more or less unreliable native auxiliaries, and thousands of helpless ryots who dare not complain of some of their most serious wrongs from their subordinates. Superimpose upon all these duties those belonging to departments desiring information and assistance, or contending against the canals on behalf of their clients, and one forms some idea of the responsibilities resting upon the shoulders of Indian officials, and especially of the men in charge of canals and their divisions. Seeing their high character and great ability, recognising their physical trials when in the weary, wasting, feverish, autumn heats, the demands upon them culminate—the safety of the summer crops requiring them to be abroad daily, at a time of year when all the heads of the service have fled for relief to the cooless of the hills—it is not too much to say that, after all, the finest product of irrigation in India is, and is, the gallant company of its engineers. Enormous responsibilities are theirs, and they have discharged them, with as much courage and as much success, as their brethren who have stormed the hill forts, or faced the tremendous odds of battle, planting the standard upon a territory which even then was but half won, seeing that it had next to be maintained by an endless struggle, no longer severe, for fertility and against drought.

It cannot be said that even upon the spot the services of the engineers have not been duly recognised by those entrusted with the control of the administration. Farsighted Viceroyes have adopted a bold policy of expenditure upon irrigation works, and thoughtful members of other branches of the service have at times expressed their admiration for the ability which has made them a success, but the men themselves have rarely been rewarded as they deserved, either in view of the importance of their charge or of their arduous conditions, even when measured against the always exhausting work of other officials in the same outlying districts.

The Water Supply Department, as a whole, is a bureaucratic service which, though not free from faults, has an honourable record, and will certainly compare favourably in energy or ability with any other Department in India. It adds greatly to the ease of administration, though it multiplies its perils, that the clients affected belong to a subject race, and that the vernacular journals do not appear to have yet developed that critical faculty which makes the press in Anglo-Saxon communities occasionally a means of mischief, but on the whole a most efficient and invaluable spear to administrative lethargy and favouritism. The public spirit, incorruptible integrity, and tenderness to the natives exhibited by most officers is highly creditable to them and to their country. So far as can be judged by a passing stranger they do their work admirably, and considering all the circumstances of the case, inexpensively also. The irrigation branch, like every other has been always subordinated to considerations of State, was originally entirely in the hands of military men, and still retains a great number of officials who bear military titles, though during their whole careers they may have been engaged on civil service. The Royal Engineers have found the water supply offices happy hunting grounds in which their term was counted for promotion, where they enjoyed as a rule increased emoluments, and could take up their martial duties if at any time inclination or prospects of advantage prompted them. This system worked well for them, and perhaps well for the country, as it allowed the retention on the spot of able men, available for active warfare at any sudden emergency. The distinguished part played at the siege of Delhi by Colonel Baill Smith adds an additional laurel to the crown which he won by his literary and professional successes in connection with irrigation.

The civil service however, complained, and not unreasonably, that the prizes of the Department were all reserved for soldiers, while the steadier work and lower pay of subordinate positions were left to them. For years their protests were disregarded, but gradually their position has been bettered, and quite recently a new set of regulations has been prepared which will tend to equalise their chances, and secure them a fair reward for their labour. As a matter of fact this appears to be chiefly due to the growing complexity and importance of the work of irrigation engineers. In the early days canals were regarded as an ordinary piece of work, to which any professional men might be detailed with confidence, and many of the costly blunders committed were due to this ignorance, and to the want of training possessed by military engineers. Here, as elsewhere, the specialisation of functions has proceeded; and the need for practical experience of a particular kind, in addition to special ability, has been recognised at headquarters. Madras and Bombay to-day have civil chiefs, and the Punjab a strong body of eminent civil officers under Colonel Ottley. The North-West Provinces and Bengal are still under military direction, but in the former of these the civil element is growing. There is no doubt that the subordination of irrigation to military necessities has been a cause of loss to the Department, but it has given on the other hand so many men of conspicuous ability to the service that
IRRIGATED INDIA.

it would be ungrateful to press the complaint. It has been necessary to build up the Empire of India, as Jerusalem was rebuilt in the time of Ezra, sword in one hand and trowel in the other. To the men of the sword rightly belongs a chief share of the honour, even of its passing achievements.

The Government expenditure may be viewed in several ways. Thus, regarding works which are almost wholly new, the figures would run :-

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Acres irrigated annually</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ajmere</td>
<td>160,000</td>
</tr>
<tr>
<td>Bombay</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Sind</td>
<td>1,800,000</td>
</tr>
<tr>
<td>Bengal</td>
<td>6,000,000</td>
</tr>
<tr>
<td>North-West Provinces</td>
<td>8,000,000</td>
</tr>
<tr>
<td>Madras</td>
<td>3,300,000</td>
</tr>
<tr>
<td>Panjab</td>
<td>6,650,000</td>
</tr>
</tbody>
</table>

The fact that native works have been more largely utilised in Madras than elsewhere partly explains the relative cheapness of its schemes. Roughly it may be concluded that British canals have cost £4 per acre irrigated, and they pay 3½ per cent. on the outlay. Adding native canals, absorbed in Government schemes, the total would be increased by—Burmah, 200,000 acres; Sind, an extra 1,000,000 acres; and Madras another 2,500,000 acres, making about 13,000,000 acres for £33,000,000, yielding 4 per cent. net revenue. In the course of a few years the total irrigated area will rise to about £35,000,000 outlay for 15,000,000 acres watered, reckoning twice-cropped land twice, so that in reality the actual surface cultivated is considerably less. To this total has to be added the immense extent of country everywhere, but especially in the North-West Provinces and in Madras, supplied from wells and tanks by the Hindus themselves, and also the totals of the independent states, including Government and private schemes. There is no absolutely trustworthy record of these, but it is safe to say that they more than double the land irrigated from the canals of the British Government. There are, therefore, over 30,000,000 acres watered every year within the Empire, with a constant tendency to increase the area. Nowadays this increase is limited by the fact that almost all the accessible supplies have been utilised, and, as in the Punjab, large schemes are required to command new territory. Neither in Bombay nor in Bengal does irrigation pay the State, but large works pay 5 per cent. in the Punjab and in the North-West Provinces, 7 per cent. in Madras, and 12 per cent. in Sind. It pays the Hindus everywhere, for without it millions could not live at all, and millions more would be destitute of famine every few years. Reckoning its influence upon the railways, commerce, and good government of the country its value is simply incalculable.

The great irrigation works of India are wholly constructed with borrowed money, raised in London, and charged to the works at from 3½ to 4 per cent. The price need not be wondered at, seeing that the guarantee of Government is behind the debentures. Though this of itself would suffice, there are the further facts that the money is spent in a populous empire, with an enormous revenue, and that the works as a whole are remunerative. In Madras, the North-West Provinces, the Panjab and Sind, they yield handsome profits; in Bombay they are likely to pay for themselves, and in Bengal, they are, after all, the cheapest and best means of fighting famine, and saving the public treasury from ruinous drafts in bad seasons. On the merits of the investment, therefore, the stock would be entitled to rank high, apart from the guarantee.

Before the colonies can hope to see their irrigation proposals regarded in the same light they must be able to satisfy the capitalists of the mother country that the outlay is reproductive, for, quite content with the credit of the Government, the Briton has never really considered either Indian or Victorian expenditure under this head. Except the directors of the Scotch companies, which have done well in Colorado and other of the American States, the moneyed men of Great Britain know nothing of irrigation ventures. The Madras and Orissa companies, if not forgotten, would certainly not have encouraged a favourable view, even in India. Those who lend upon colonial securities are entirely unacquainted with them, and are likely to regard State loans which are employed to benefit private lands with a considerable amount of suspicion. The debt of Ceylon is so light as to attract no attention, and the greater part of her irrigation capital has been drawn from revenue. Mildura should have an excellent influence upon investors when sufficient time has elapsed for its financial results to be gauged, but even its enterprising managers are understood to have had an unreasonable difficulty in getting their prospects appreciated by financiers here and at home.

Colonial irrigation has to justify itself, and those connected with it therefore must be upon their mettle in order to render its balance sheet above reproach. This does not imply that special consideration should not be given to the enterprise in its earlier years, and while its novelty tells against it, even with the farmers, but it does remind us that the new departure is to be judged by its profit and loss account, and that this will influence not only the taxpayers who are not irrigators, but those who make advances to us for the prosecution of reproductive public works. In this respect India has the advantage. The Madras schemes are debited with 3½ per cent., and the others, except Bombay, which takes 4 per cent. as the cost of its money, reckon at 3½ per cent., or at least one half per cent. less than ours are debited with under the law. Judging by recent events, no very early reduction of the rate below 4½ per cent. is to be hoped for in Australia.

The State in India means the Government in a deeper sense than in Australia, for in that country the citizens are unable to mould the Government to their wishes, having themselves practically no political opinions, and no political privileges whatever. Instead of
projects for the watering of a special area originating with the farmers, as in Victoria, and being subject to their specific approval, the Indian ryot, although in most cases he bears the same responsibility for interest upon the capital expended in providing him with an artificial water supply, is never consulted in any way or at any stage in the construction. Government initiates designs and executes the work, offering him the water if he likes to take it, and relying only upon his self-interest to induce him to become a purchaser. In the Punjab a system of compulsory labour prevails, and in Ceylon the sanction of the natives concerned is required before Government advances are made, but in each case this has regard to minor works, in which the State is little more than a sleeping partner. Upon all "major" schemes the Government acts of its own motion, at its own responsibility, and acknowledges no title in those who use the water to criticise its proposals. In an equally peremptory way it ignores riparian rights, or makes but small compensation for actual injury done or land taken; not that this involves injustice, because the tenure of land is less absolute, and the property affected far less valuable than in Australia. The advantages of a despotic rule are exhibited in such cases as these, where the officers of the department are perfectly free to choose the best scheme possible, and to execute it without regard to the individual wishes or interests of their constituents. In the colonies these would be forced upon their attention at every step, and they would have to pay dearly for any encroachment, or imaginary encroachment, upon them.

Of course works of some kind, probably in the first instance inundation canals, go back before history, though it was not until the thirteenth and fourteenth centuries that any schemes pointing to the perennial canals of to-day appear to have been attempted. There are remains of large disused storages in all parts, and some still in operation are of great age, but the watering from these has never been relatively extensive. The primitive rain-filled tank, or little well, remain the chief sources of native supply outside the domain of the Government schemes. Millions of acres have been, and are, irrigated annually from them by the simplest means. It is to these, and not to the Mughal canals, or the tanks built by Muhammadan monarchs, that the people have trusted for ages. Almost everywhere had its own separate supply, the task of securing and utilising it forming the chief concern of the ryot, and the title to its possession being more important because necessarily implying that to the land which it made fruitful. The cattle required to draw water from the deeper wells form on this account a chief element of the farmer's wealth, and their capital value has assisted in certain districts to make a distinction between the proprietor and his labourers. The whole agricultural system, and in it some degree the social system, of parts of India have been greatly modified by the practice of irrigation, but in ways which have nothing to teach us. The solitary inference to be drawn from a glance at the Hindu experience is that similar results are certain to follow in Australia, where new principles of ownership, and fresh legislation recognising a property in water, are inevitable. It would be well if they were introduced at once, before more vested interests are created.

How widely the position of the farmer under the Victorian Irrigation Act varies from that of the Indian ryot under an irrigation canal, should scarcely need further exposition. The ryot has no responsibility except to pay for the water when he gets it, and even then may obtain a partial or complete remission if his crops fail. This may seem an ideal condition to the resident in the Goulburn Valley, but it must be remembered that this immunity from risk is part of a system, and is purchased by serious disqualifications of another kind. The Victorian farmer within a trust area is responsible, not only for the water he may purchase, but for his proportion of the difference between the sum obtained from sales, and the amount necessary to pay 4½ per cent. interest upon the capital cost of his scheme, and of the national work, if any, which feeds it, after providing for working expenses. What he gets in return for this is the power of voting for or against a project in the first instance, and of shaping it afterwards to meet his view of present necessities, with the right of managing it economically, and then to ensure justice for himself and those who live near him. Finally, if he pays his sinking fund long enough, the obligation upon his land for interest will be entirely extinguished, and the whole scheme will become the property of his children, who will be liable only for levies to meet its working expenses. The means of criticism which he enjoys attach to him it is true, not as a trust member, but as the citizen of a free community. Yet he would not have the power to make his criticism effective, as the mere unit of one constituency for each branch of the Legislature, in anything like the degree that he now enjoys as the constituent of a small municipal body, in which his personal influence can be directly exercised upon the scheme itself. Local control can scarcely fail to be more effective, as well as cheaper, than control from a distant capital by political agencies.

But perhaps the best criticism of the Indian system of sole State responsibility is to be found in the constant efforts to mitigate it. Wherever possible a village is dealt with as a whole, and required to settle the distribution of water, and all disputes arising from it. From Ceylon to the Panjab we find this practice pursued wherever feasible. The "headmen," as they are termed, in all settlements, are invariably encouraged to become answerable for the main administration, and, as has been seen, committees, or panels of malals, are especially created for the purpose on inundation canals. In every way legislation strives to throw upon the residents of each locality the task of settling their own affairs, and of securing protection to the works as common property. Even in the independent territories similar methods of local government, on a small scale, have sprung up, testifying in the strongest and clearest manner to the necessity which everywhere exists for it in connection with irrigation. It is not too much to say that so far as circumstances
permit the Indian system is being approximated to our own, though still conveying a very limited authority indeed to the ryot; that the associations of irrigators in France, Italy and America represent the development in a higher form of the same principle of local responsibility; and that the Victorian Trust system as it now stands is their ideal, and the ideal of irrigators all the world over.

State advances of cheap money for the construction of works, chosen and managed by those dependent upon their supply, represent as nearly as possible the perfect system for white farmers. Those who oppose it seek to diminish the responsibilities of the people concerned, and to cast them upon the general body of taxpayers, just as members of shires created and authorised to raise rates to make roads and bridges, ask that they may be built for them by the Public Works Department. There are instances in which an appeal to the public purse is valid in each case, but they are few and special. There is no just and no sane principle for the distribution of public funds except that they should be expended to benefit taxpayers in proportion to their contribution, or to the urgency of their special need. Local expenditure should mean local taxation, to raise the necessary sum, or pay interest upon it; any departure from this means the reduction of politics to a selfish game of grab.

If the Australian is to cast all his responsibilities upon his Government, he must endow it with powers equal to its task, including power over himself and his property, which would render him in some respects a mere ryot. If he accept the privileges of freedom and free institutions, he must bear his burdens for himself, in common with his fellows, and in conjunction with them. The alternative is to yield both burdens and freedom to the State.

It must never be forgotten that in arid Asia irrigation has been an essential, and whether in Persia, Afghanistan, or the region to the north of them, and whether in ancient or modern times, has supplied in a large measure the means of maintenance to its peoples. The oasis of Turfan, according to a Russian report published in Nature of this year, contains colossal works of the same character as those of Ontario and other places in California, bringing the water to the surface by means of tunnels or of wells, sometimes 300 feet deep. Sir Colin Moncrieff recently visited a part of the Russian territory where there are still to be seen remains of vast schemes constructed in a remote age, but it is understood that his report is unfavourable to any extensive attempt to reconstruct them. The canals and tanks of India were not undertaken for profit, nor yet merely to increase an established prosperity, but under the terrible pressure of necessity. Of course the production of the country cannot be indefinitely increased by such means, but it can be rendered fairly even, guarded against adverse seasons, and a reserve provided by means of an artificial water supply. Irrigation in India spells immunity from famine. There its mission begins and ends; and by this knowledge every one of its phases must be interpreted. The threatened failure of the Kaveri, and the actual failure of the Godaveri supplies, led to the initiation of works in the South, while the several stages of irrigation progress in the North were marked in each instance by the recurrence of famines. That the schemes have been made to pay on the whole, and that the expenditure taken in the aggregate leaves good interest, is satisfactory, but it must be admitted that the State is in every case more lenient than private proprietors would be, and that taking into account the low charges, the frequent remissions, and the princely scale of many of the schemes, the marvel is that so favourable a result is secured.

Our own circumstances have offered but a faint reflex of these; we have had water famines, and we always shall have a considerable Government, abundantly content if it receives interest upon its advances to the farmers. But there the likeness ends, and it will not be until our population, multiplied many times over, comes to press upon the means of subsistence with a terrible intensity, that we can conceive the same urgency for expenditure on water supply for agriculture as has existed in Asia. Our irrigation is undertaken to develop new cultures, and especially highly-priced products, such as fruit and wine, while at the same time steadying farming generally, by guaranteeing pasture for flocks and grain for the mill, in droughts as well as in propitious seasons. This being the case, there is no need for any undue haste or excited adoption of undigested projects. We have made a good start, and what remains is to develop our water resources quietly but unceasingly on sound lines. This is not to be done in an instant; indeed, it is a work that will never be absolutely finished. The best executive officers reckon that their practice is altered materially every five years. Indian engineering is thoroughly progressive, and so keen are the wits, and so restless the energy of those employed upon it, that they are always leaving their former achievements behind, and pushing on to better things. It is not simply that each generation, brief as is its stay in the country, improves upon its predecessor, but the same officers confess that they have learned to avoid errors, to cheapen construction, and to make administration more efficient. There is now nearly a century of accumulated experience to work upon, although the great undertakings have only been commenced in the latter half of it, and still there is a buoyant confidence in the accomplishment of larger successes than have yet been gained, which is in itself one of the most encouraging features of the system, and a bright augury for its future. Although State directed and State controlled, there is no visible stagnation among the professional officers of the Water Supply Department. Australia will do well, therefore, not only to secure the present experience of the empire, but to take care to keep abreast of its developments from time to time.

To sum up then, the legislation of Irrigated India has not much to teach us, its administration little, its practices little, its relations of State department and people little, its agriculture very little, but its methods of construction, management of canals, conservation and distribution of water can teach us a great deal. The circumstances out of which irrigation began are not unlike ours, but we
may hope that its final outcome with us will be very unlike that which it is reaching in Asiatic realms, where it provides fresh food fast, only to find the population increasing faster, and not permanently rising, or likely to rise, in the social, moral or intellectual scale, to even a European standard. Given a rational and equitable riparian law, a generous encouragement to farmers who enter upon new cultures, or face the outlay necessary to prepare their land for irrigation, a keen supervision of Trusts by the department, and an intelligent criticism by their constituents of all their proceedings, coupled with such study and practice at our agricultural colleges as shall solve local problems in a practical manner, and there need be no doubt of the future success of irrigation. The French system of small holdings, Italian skill in dairy farming, American methods of co-operation, and enterprise in making markets, are all worth acclimatising, as are Indian engineering designs and devices. The outcome of the writer's observations in India are at least as stimulating and encouraging as those which six years ago were embodied in his report to the Government upon the irrigation of Western America. Clearly, existing systems have much to teach us, and it will be well for us if Australia, the last continent to be colonised by white men, and the only one built up solely by Anglo-Saxons, should be noted for its openness to new ideas, its freedom from the prejudices of custom, its readiness to adopt improved practices wherever they can be found, and its progressiveness even in agriculture. Our people have often been commended for the warmheartedness of their welcome to strangers, and if they can become, as well, hospitable in their thinking, methods of working and mode of living, acclimatising and assimilating the best of all that has been, and now is, they will make no ordinary history, and merit no ordinary reward.

APPENDIX

CHAPTER I.

IRRIGATION IN CEYLON.

Irrigation has been practised in Ceylon for many hundreds of years, and upon a scale that, considering the size of the island and the difficulties which it presents is truly surprising. "Excepting the exaggerated dimensions of Lake Moeris in Central Egypt, and the mysterious basin of Al-aram, the bursting of whose embankment devastated the Arabian city of Mareb, no similar constructions formed by any race, whether ancient or modern, exceed in colossal magnitude the stupendous tanks of Ceylon," says Sir Emerson Tennant. One or two illustrations will convey an idea of the extent of these ancient operations. The Padivil dam is 11 miles long, 400 feet wide at the base, 30 feet wide at the crest, and in places 70 feet high. It was faced along its whole length with steps of large squared stone, and at the rates for native labour is estimated to have cost £1,300,000. The Kalawewa Tank was 40 miles in circumference, with an area of 6,000 acres, and contained over 3,000,000,000 cubic feet, or three times as much as the Yau Yean. The work requisite to retain this quantity was much more than three times that required on the Plenty. The dam had a length of 12 miles, averaging 50 to 60 feet in height, and was 20 feet broad at the crest. Anuradhapura, the former capital city, was supplied from this site by means of a channel 40 feet wide and 53 miles long. In addition to this it fed innumerable tanks of varying capacity and constituted in itself a storage of no mean order. Two schemes in the north are of such dimensions that their restoration at the present time would absorb £200,000. They are now recommended to be carried out upon the old lines, which are still discernible. The Ambanganga River was dammed by a solid work of masonry 99 feet in top width, and rising 40 feet above the ordinary high level of the stream. An embankment was carried thence, from 40 feet to 90 feet in height, for 24 miles, forming a series of navigable lagoons, and then further prolonged by a canal for 57 miles more. Even allowing for the despotic authority exercised by the kings over their subjects, who were required in many cases to give their labour, the boldness of these designs