

1884.

VICTORIA, Aus. Commission, Calcutta
international exhibition

CALCUTTA INTERNATIONAL EXHIBITION,
1883-84.

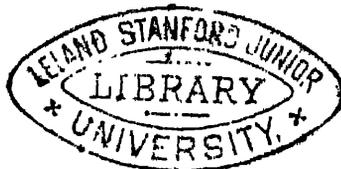
REPORT OF THE ROYAL COMMISSION FOR VICTORIA,
AT THE CALCUTTA INTERNATIONAL EXHIBITION,
1883-84.

PRESENTED TO BOTH HOUSES OF PARLIAMENT BY HIS EXCELLENCY'S COMMAND.

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*VICTORIA, by the Grace of God of the United Kingdom of Great Britain
and Ireland Queen, Defender of the Faith.*

TO Our trusty and well-beloved JOSEPH BOSISTO, Esquire, M.P., J.P.; the Honorable JOHN WOODS, M.P.; the Honorable JAMES LORIMER, M.L.C., J.P.; JAMES GIBB, Esquire, M.P., J.P.; JOHN NIMMO, Esquire, M.P., J.P.; JOHN BLYTH, Esquire, J.P.; THOMAS PATRICK FALLON, Esquire, J.P.; DAVID MITCHELL, Esquire, J.P.; ANDREW PLUMMER, Esquire, M.D., J.P.; ANDREW ROWAN, Esquire, J.P.; HENRY BURROWS, Esquire; ROBERT CALDWELL, Esquire; ALEXANDER CAUGHEY, Esquire; J. HARWARD DE RINZY, Esquire; FREDERICK S. GRIMWADE, Esquire; ROBERT J. JEFFRAY, Esquire; HENRY MADDEN, Esquire; GEORGE JOHN SIMS, Esquire; and JOHN B. WHITTY, Esquire,

GREETING—

WHEREAS it has been notified to Us that an International Exhibition of Works of Art and the Products of Agriculture and Industry will open at Calcutta in the month of December next: AND WHEREAS it is in every respect desirable that our Colony of Victoria should be duly represented at the same; NOW KNOW YE that We, reposing great trust and confidence in your knowledge and ability, have constituted and appointed and by these presents Do constitute and appoint you the said JOSEPH BOSISTO, JOHN WOODS, JAMES LORIMER, JAMES GIBB, JOHN NIMMO, JOHN BLYTH, THOMAS PATRICK FALLON, DAVID MITCHELL, ANDREW PLUMMER, ANDREW ROWAN, HENRY BURROWS, ROBERT CALDWELL, ALEXANDER CAUGHEY, J. HARWARD DE RINZY, FREDERICK S. GRIMWADE, ROBERT J. JEFFRAY, HENRY MADDEN, GEORGE JOHN SIMS, and JOHN B. WHITTY to be Honorary Commissioners for Our said Colony of Victoria in connexion with the Exhibition aforesaid: AND We do by these presents give and grant unto you full power and authority to carry into effect the purposes of this Our Commission by all lawful ways and means whatsoever: AND We do hereby appoint you the said JOSEPH BOSISTO to be the PRESIDENT of this Our Commission: AND for your assistance in the due execution of this Our Commission We do hereby appoint JAMES THOMSON, Esquire, to be Secretary to you Our Commissioners, and to attend you, and his services We require you to use from time to time as occasion may require; AND, LASTLY, We do by these presents ordain that this Our Commission shall continue in full force and virtue, and that you Our said Commissioners shall and may from time to time, and at any place or places, proceed in the execution thereof and of every matter and thing therein contained, although your proceedings be not continued from time to time by adjournment. IN TESTIMONY whereof We have caused these Our letters to be made patent and the Seal of Our said Colony to be hereunto affixed.

WITNESS Our right trusty and entirely beloved Cousin and Councillor the Most Honorable GEORGE AUGUSTUS CONSTANTINE, Marquis of Normanby, Earl of Mulgrave, Viscount Normanby, and Baron Mulgrave of Mulgrave, all in the County of York, in the Peerage of the United Kingdom; and Baron Mulgrave of New Ross, in the County of Wexford, in the Peerage of Ireland; a Member of Our Most Honorable Privy Council; Knight Grand Cross of Our Most Distinguished Order of Saint Michael and Saint George; Governor and Commander-in-Chief in and over Our Colony of Victoria and its Dependencies, &c., &c., &c., at Melbourne, this twenty-fourth day of April, One thousand eight hundred and eighty-three, and in the forty-sixth year of our reign.

(L.S.)

NORMANBY.

By His Excellency's Command,

GRAHAM BERRY.

REPORT.

To His Excellency SIR HENRY BROUGHAM LOCH, Knight Commander of the Most Honorable Order of the Bath, Governor and Commander-in-Chief in and over the Colony of Victoria and its Dependencies, &c., &c., &c.

MAY IT PLEASE YOUR EXCELLENCY :

We, the Commissioners appointed on the 24th day of April, 1883, by His Excellency the Marquis of Normanby, for the purpose of arranging for the representation of Victoria at the Calcutta International Exhibition, have the honour to submit this our Report on the conclusion of our labours.

Shortly after receiving our Commission under the seal of the colony, a meeting was held in the Melbourne Town Hall, at which committees were formed, rules adopted, and other preliminary business transacted. As it was announced that the Exhibition would be opened by His Excellency the Viceroy of India on the 4th December 1883, only little more than half-a-year remained in which to prepare, collect, and transmit exhibits to India, so that energetic action was necessary in order to ensure anything like a creditable display of the resources of the colony being made. In addition to the usual mode of appealing to producers, manufacturers, and others by circular, the local governing bodies and agricultural societies in the principal centres of population were invited to co-operate with the Commissioners, and a fairly satisfactory result was achieved. Several of the committees of Commissioners interested themselves actively in the collection of exhibits, and devoted a considerable amount of time to travelling in the metropolitan and country districts. Ballarat, Geelong, Sandhurst, Castlemaine, and Lancefield, were amongst the places visited, exhibits of a valuable character being obtained from each. The Commissioners continued to meet weekly until the departure of the President and Secretary for the scene of the Exhibition, the attendance throughout being well maintained. In all, thirty-five meetings of the Commission have been held.

Notwithstanding the comparatively limited period allowed for preparations, the producers and manufacturers of the colony responded liberally to the invitation of the Commission. Over 300 applications for space were received, the number of separate exhibits amounting in the aggregate to 2,346, a number considerably in excess of that forwarded to any previous Exhibition outside the colony. Many of them were of exceptional merit and of high value. Most of the leading branches of the producing and manufacturing industries were well represented, as may be inferred from the fact that such a large percentage of the Victorian exhibitors received awards at the hands of the jurors, nearly all of whom were acknowledged experts in their several departments. The number of gold medals awarded to Victoria was 38, while certificates of

the first order of merit, with silver medals, were awarded to 60 exhibitors in the same court; 53 certificates of the second order of merit and bronze medals, together with 46 minor awards, completing the list of Victorian awards, the total being 197, or nearly 70 per cent. of the whole, a result which must be regarded as eminently satisfactory, when it is considered that the awards were gained in open competition with the world. Eleven gold and eight silver medals were awarded to Victorian exhibitors of wines, and the high position taken by this colony on the occasion should act as a further stimulus to that important and growing industry.

The liberality of the Government in setting apart a sum of money for the purpose of obtaining collections of natural products, &c., enabled the Commission to forward a number of interesting exhibits from the Departments of Agriculture, Mines, Education, Water Supply, and Customs, also from the Government Botanist, the directors of the Technological and Natural History Museum, and Melbourne Botanic Gardens, all of which materially contributed to the success of the Victorian Court. These were, at the close of the Exhibition, presented to the Government of India for distribution amongst various public institutions and societies in that country. The National Agricultural Society, the Melbourne Corporation, and the Ballarat and Richmond City Councils also contributed samples of products and photographs, which were similarly disposed of, the Government of Bengal having announced their intention of reciprocating by an exchange of other interesting objects in due course. To these bodies, and also to the exhibitors generally, the thanks of the community are due, as, owing to their hearty co-operation, Victoria was better represented than on any previous occasion, the court allotted to this colony being the third largest in the entire Exhibition, while in point of attractiveness it was only excelled by that of India. It is estimated that the Victorian Court was visited by upwards of one million of people.

Every assistance was rendered to the Commission by the Honorable the Chief Secretary and the officers of his department, through whom all business with the Government was transacted; and we desire to place on record our thanks for the unvarying courtesy and assistance received at the hands of the Hon. Graham Berry, Mr. Wilson, Under Secretary, and other officers.

Our thanks are due to the Right Worshipful the Mayor of Melbourne, Councillor Charles Smith, M.P., for the use of a room in the Town Hall for meeting purposes, and also to the Minister of Railways for concessions in the matter of carrying and storing exhibits.

Appended to this, our Report, is a statement of expenditure, which discloses the gratifying fact that, notwithstanding the payment of £430 for space, and the heavy expenses of freight, fitting up, maintenance, &c., a balance of over £350 remains in the Treasury out of the sum voted by Parliament.

That the late Exhibition will be attended with good and lasting results is beyond doubt. Comparatively little was known of Australia in India prior to the Exhibition, but through its agency many thousands of our fellow subjects in that great empire have been made acquainted with our products and resources, and the advantages—material and social—which this and the other colonies possess as a place of change or permanent residence. There has already been a decided influx of visitors to Victoria from India, and, as greater facilities for direct and expeditious travelling

between the two countries will soon be afforded, a steady development of both passenger and trade traffic is almost certain to follow. It is evident that many articles, for the production of which this and the other Australian colonies enjoy special advantages, would find a ready and profitable sale in India, but concerted action on the part of persons interested would be necessary to ensure success. The report of the President and Secretary to the Commission relative to their labours in India will be found to contain some interesting and valuable information respecting this and other matters of importance to the colony.

Very few of the exhibits forwarded from Victoria were returned—out of over 1,100 packages despatched, only 45 having been reshipped back to Melbourne, most of these being show cases, pictures, &c., lent by their owners. The whole of the business of the Commission has now been concluded—a circumstance which speaks for itself, as only a little more than three months have elapsed since the Exhibition was declared closed by the Viceroy of India.

The Commissioners, in conclusion, desire to express their best thanks to the President, Joseph Bosisto, Esq., M.P., for the able manner in which he has filled that onerous position, and for the great amount of time and attention he has throughout given to the business of the Commission, particularly while in India. His lengthened sojourn in Victoria and experience of its varied resources, combined with his scientific knowledge, rendered his representation in India especially valuable, and we are satisfied that in securing Mr. Bosisto as President of the Commission the colony was immensely benefited. Our thanks are also due to the Honorable John Woods, M.P., and Mr. G. J. Sims, two Members of the Commission who attended the Exhibition, and in their honorary capacity afforded material assistance. Mr. James Thomson, our Secretary, has performed the duties of his position to our entire satisfaction, and we are pleased to place on record our appreciation of the admirable manner in which he has conducted the affairs of the Commission to a most successful conclusion.

We humbly submit to Your Excellency this our Report.

JOSEPH BOSISTO, President,
 THOMAS PATRICK FALLON,
 GEORGE JOHN SIMS,
 JOHN B. WHITTY,
 ROBERT CALDWELL,
 JAMES HARWARD DE RINZY,
 HENRY BURROWS,
 JOHN WOODS,
 ANDREW ROWAN,
 JAMES LORIMER,
 JOHN BLYTH,
 DAVID MITCHELL,
 ANDREW PLUMMER, M.D.,
 ALEXANDER CAUGHEY,
 JOHN NIMMO,
 JAMES GIBB.

Messrs. GRIMWADE, MADDEN, and JEFFRAY are absent from Victoria.

JAMES THOMSON, Secretary.

July 17th, 1884.

FINANCIAL STATEMENT.

Dr.

Cr.

To	£	s.	d.	By	£	s.	d.
To Amount of Parliamentary Vote ...	5,500	0	0	By Freight and insurance of exhibits and sundry charges thereon ...	972	17	1
				Payment of space occupied by Victorian Court ...	480	0	0
				Amount expended in defraying cost of forming collections of indigenous products, mineral and geological specimens ...	509	7	7
				Fitting-up, decorating, and maintaining Victorian Court ...	1,199	9	5
				Stationery, advertising, and printing ...	126	11	0
				Salary of Secretary and officers, wages of attendants and labourers ...	1,019	10	9
				Travelling expenses of President and Secretary ...	634	7	10
				Expenses connected with the collection of exhibits, formation of local committees, &c. ...	74	7	0
				Incidental expenses, including exchanges on bank-drafts, petty cash, and all miscellaneous charges ...	143	11	5
				Cash to credit of Commissioners in Bank of Victoria ...	87	10	11
				Balance of Parliamentary Vote remaining in Treasury ...	372	7	0
	<u>£5,500</u>	<u>0</u>	<u>0</u>		<u>£5,500</u>	<u>0</u>	<u>0</u>
Balance	£372	7	0				

8rd July, 1884,

JOSEPH BOSISTO, President.

JAMES THOMSON, Secretary.

REPORT OF THE PRESIDENT AND SECRETARY TO THE COMMISSIONERS.

GENTLEMEN,

We have the honour to report that, upon the completion of the preliminary work of collecting and classifying exhibits, compiling the catalogue, &c., the Secretary left Melbourne for the scene of the Exhibition. Advantage was taken to ship most of the fragile and bulky exhibits by the *Newcomen*, a vessel sailing direct to Calcutta, and they arrived there almost simultaneously with the Secretary, who was thereby enabled to make an immediate start with the work of fitting up the court. The exhibits by that vessel arrived in very satisfactory condition; but some of those subsequently despatched by the ordinary route *via* Colombo were damaged, and subjected to detention, which, in several cases, prevented some of them from being displayed until after the day of opening. The total number of packages shipped for the Victorian Court was larger than that previously recorded for any Exhibition held outside the colony, while the exhibits were more diversified and valuable in character. Notwithstanding the fact that there were so many shipments, transshipments, and detentions, all the packages were eventually delivered, not a single exhibit (save some perishable articles) having gone astray.

The Secretary reached Calcutta on the 12th October, seven weeks prior to the opening of the Exhibition, and at once received possession of the court allotted to Victoria. The building, although of a temporary character—having been built solely for the Exhibition—was in an admirable position, being situated between an ornamental piece of water and the southern wall of the British Court. The materials used for the building were of such a character as to necessitate a considerable amount of special fitting up and decoration; but, owing to the good offices of Colonel Trevor, Vice-President of the Executive Committee, valuable assistance was rendered by the Public Works Department of India, and upon the arrival of the President, a month later, the work had been well advanced. All the Australian Colonies represented at the Exhibition were placed close together; the Victorian Court being separated from that of New South Wales by a narrow transept only. The two other colonies taking part in the Exhibition were Tasmania and South Australia. Next to the Indian and British sections, the Victorian was the largest in the Exhibition, both in respect of area and the number of exhibits. The Australian display, as a whole, was most creditable, and created a highly favorable impression in the minds of Anglo-Indian and native visitors.

The President left Melbourne on the 11th October, and reached Calcutta nearly three weeks before the opening day. Soon after his arrival, an interview was arranged with Colonel Trevor for the purpose of discussing sundry questions, such as the payment of space, and the position occupied by the Indian Government with respect to the Exhibition. In addition to the President and Secretary of the Victorian Commission, Messrs. Franklin and Stuart, the representatives of New South Wales, were present. A satisfactory understanding was arrived at, and, although space had to be paid for to Mr. Joubert, as promoter of the Exhibition, the Australian representatives received full recognition at the hands of the Indian Government throughout their stay in that country. Passes over all the lines of railway were granted, both by the Government and by companies, and every facility was afforded for seeing the country, and for forming an acquaintance with its vast resources.

Calcutta was visited by a considerable number of Victorian residents, amongst them being the Hon. John Woods, M.P., and Mr. G. J. Sims—two members of the Commission, both of whom were assiduous in their attendance at the Court and rendered valuable assistance; also the Hon. T. Bent, M.P., Mr. C. E. Bright, C.M.G.; Dr. Gilbee, and Mr. Jenkin Collier. These gentlemen also evinced much interest in the Victorian Court.

Owing to the fact that an Exhibition of such magnitude was an unprecedented event in Calcutta, and that, for all kinds of work, almost entire dependence had to be placed upon native, and in most cases unskilled, labour, the fitting up of the court was attended with much difficulty, but, notwithstanding all obstacles, the Victorian section was perfectly ready on the opening day. Its appearance was the subject of favorable comment from all visitors, and in nearly all the leading journals of the day the most flattering allusions were made to the position occupied by Victoria at the first International Exhibition held in the Indian Empire. The effective Australian participation generally formed one of the prominent features of the report of the Executive Committee to His Excellency the Viceroy on the occasion of the opening ceremony, and, in replying, particular stress was laid by the Marquis of Ripon on the many commercial and social advantages likely to spring from the better knowledge of the colonies which the people of India would thenceforth possess.

APPEARANCE OF THE VICTORIAN COURT.

The exhibits in the Victorian section were arranged in their respective departments, the first part of the court being assigned to the fine arts—oil paintings and water-colour drawings, photographs, engravings, lithographs, &c.; then followed chemical and pharmaceutical preparations, perfumery, &c.; the next exhibits in order being furs, woollen manufactures, hats, &c. The wine industry was represented by a double Saracenic arch, which spanned the main avenue, symbolical statuary being disposed underneath. Further on, the leather manufactures of the colony were displayed, and then followed food products, timbers, metal manufactures, natural history, mineral and geological specimens, the whole terminating with a splendid collection of ferns. The following detailed description is taken from the *Argus* special report:—

“The Victorian Court occupies the whole of one annexe, 300 feet long and 45 feet wide. It has an advantageous position, as the whole of one side is bounded by a promenade, running along the bank of a lake. The main entrance is from the transept, which is raised eight feet above the floor level, and consequently an excellent view of the court can be obtained before entering it. The first part is devoted to fine art exhibits, and, although the collection is not a large one, it has attracted the attention of visitors in a marked degree. The floor has been cemented and covered with matting, and the pillars supporting the roof have been tastefully draped with pale-blue satin, so that this part of the court looks like a drawing-room. Some handsome tree-ferns, as healthy-looking as when taken fresh from their Gippsland home, are disposed about the entrance, and certainly, in point of attractiveness, the Victorian Court bears off the palm. A large Brussels carpet, representing a scene in Sassafras Gully, Dandenong Ranges, manufactured by Messrs. M. Whittall, of Kidderminster, and lent by Messrs. G. M. Whittall and Co., of Melbourne, is displayed on the right-hand entrance, and the first exhibit is a large ebonized case, containing models of the gold nuggets found in Victoria. This case is surrounded day and night by crowds of admiring natives of every degree, and the Secretary has been compelled to obtain the services of several special policemen to guard the glittering treasure. Messrs. Alcock and Co.’s billiard-table and fixtures of tulip wood, which come next, also attract much attention; and the silver and electroplated ware of Messrs. Edwards and Kaul, and Stokes and Martin, come in for a good share of admiration. Miss Annie Smith, directress of the Melbourne School of Needlework, exhibits some pretty screens and portières in the same section. On each side are ranged oil paintings, water-colour drawings, photographs, chromo-lithographs, specimens of wood engravings, maps and

diagrams, the whole making up a very creditable art gallery. Mr. John Mather's two oil paintings, "A Morning Walk by the Yarra" and "A Sunny Bank," are well displayed; Mrs. F. C. Rowan's twelve water-colour drawings of Australian and New Zealand flowers and berries have also a good position. The latter, it need hardly be said, come in for special notice; and already the Victorian art gallery—unpretentious as it is—is one of the most popular places of resort in the Exhibition. The principal exhibits occupy the centre of the court, and midway the main avenue is spanned by a double arch, of unique design, bearing nearly 2,000 bottles, all uniformly labelled, in blue and gold, "Victorian wine." The centre is occupied by a full-sized marble figure of Hebe, supported on each side by gilded hogsheads and groups of ferns, the whole forming by far the most imposing wine trophy yet displayed by Victoria. The Victorian Champagne Company has contributed a somewhat similar trophy, on a smaller scale, which occupies the whole of the archway leading into the British Court. Mr. Bosisto's eucalyptus preparations make a good show, and much interest is manifested by army surgeons and native doctors in these and other indigenous products displayed in the Victorian Court. A splendid collection of wool mats and rugs, shown by G. M. Whittall and Co., occupy a good position, and next to them are the fur exhibits of Messrs. Schofield and Co., of Yarra Flats.

"A reading-room, in which all the latest Melbourne newspapers can be perused at leisure, has been fitted up, and is thronged daily. Nothing seems to impress visitors to the court with the extent and resources of the colony more than the size and style of the daily and weekly newspapers published in Melbourne. To say that they create surprise is a mild way of putting it. Some back numbers of the Melbourne illustrated papers, sent by the proprietors of the *Argus* and *Age* for distribution, are in great demand. It is certainly an excellent means of advertising the colony, and one which should not be lost sight of in future Exhibitions. Amongst other prominent exhibits in this court is a lofty biscuit trophy, contributed by Messrs. Swallow and Ariell. It is first after the wine arches, and receives much admiration, the local newspapers being unanimous in declaring it to be one of the best arranged show-cases in the whole Exhibition. An especially good display is made of saddlery, harness, portmanteaus, and leather. In this department Victoria is the principal exhibitor as regards the actual number of articles, all of which appear to be well adapted for the Indian market. Another exhibit which surprises visitors unacquainted with the resources of the colony is a fine collection of brass and electro-plated ware, shown by Mr. John Danks, the workmanship and finish of which receive general commendation. Messrs. Zevenboom and Son show a good collection of brushes, comprising about 50 different kinds, and tweeds, hats, and caps are well represented. Some fine specimens of natural history, including birds and mammals of Victoria, are shown by Professor McCoy. They arrived in absolutely perfect condition, and form a valuable and interesting addition to the court. The timbers of the colony are exhibited in various forms by Baron von Mueller, and Mr. Newbery, of the Technological Museum. Over 50 samples of grain and other farm produce are shown in cedar cases, and a very creditable mining section is now being completed on the opposite side of the avenue. In the latter are to be found blocks of auriferous quartz, cores from diamond drills, and a diversified collection of minerals and geological specimens. Two well-fashioned church or clock bells from Victorian metal are exhibited by Messrs. Horwood and Co., of Castlemaine. These have been mounted on a massive scaffolding, and are a never-ending delight to the native visitors, who are always asking the attendants' permission to ring them.

"It is impossible to mention one-half of the exhibits in this interesting court, but this notice, brief as it is, would be incomplete without a reference to the fern gully, which is now approaching completion, at the far end of the court. The ferns and todeas brought over from Victoria have recovered wonderfully, and now look none the worse for their prolonged and rough passage by the *Newcomen* two or three months ago. It is difficult to get anything out of the way performed in Calcutta, especially at such a time as this, but the Secretary fortunately secured the services of a learned baboo, who has charge of the Eden gardens, and a rockery, with running water, has been fitted up, the fountain lent by Messrs. McEwan and Co. being placed in front. The effect is very good, the vivid green of the ferns and Mr. Grist's painted background forming a charming picture. The golden arch, which was designed on too large a scale for the interior of the court, suffered considerably from the drenching it received last week, but it has been retouched, and now impresses all beholders. During the hours of public admission the court is better attended than any other on the same side of the road, and the groups of figures dressed out in all the finery of Oriental holiday costumes, moving about amongst the ferns and blue drapery of the court, present from the transept a succession of pictures which can only be seen in the gorgeous East."

Thanks to the liberality of the proprietors of the *Argus* and the *Age*, regular files of all the daily, weekly, and illustrated journals published by them were regularly

forwarded to the Victorian Court, and Australian and all other visitors desirous of obtaining current information respecting the colonies were enabled to do so. A special reading room was fitted up in the court, and was always thronged, copies of back numbers of the *Sketcher* and *Australian News*—the illustrations in which afforded a graphic idea of the resources and progress of the colonies—being also freely distributed. These, it should be mentioned, were presented to the Commissioners by Messrs. Mackinnon and Wilson, and Messrs. David Syme and Co., free of charge, the latter firm also presenting 5,000 large views of the City of Melbourne for gratuitous distribution to visitors. A carefully compiled *Handbook of Victoria*, to which Mr. H. H. Hayter, Baron von Mueller, and the President and Secretary were contributors, was also widely distributed. Many of the exhibits forwarded were of especial merit, and found ready purchasers. Three carriages forwarded were disposed of, one being selected by His Highness the Nizam of Hyderabad, the wealthiest native prince of India. All the exhibits of sole and harness leather, preserved provisions, hops, wool, and woollen manufactures, hats, and a great number of miscellaneous articles, were sold at the close of the Exhibition, not more than three per cent. of the Victorian exhibits being returned to the colony.

Amongst inventions specially noticed was the drill test of Mr. E. T. Macgeorge, of Hawthorn, which was carefully examined by a jury of scientific experts, and unanimously awarded a certificate of the first order of merit. Another original invention forwarded from Victoria, and which attracted very great interest, was the Woods patent hydraulic railway brake, shown in the grounds of the Exhibition in working order. A rock borer, made and exhibited by Messrs. Johnson and Co., of the Tyne Foundry, Yarra Bank, attracted much attention, and was awarded the highest honour in the power of the jurors to bestow. The spark arrester invented by Mr. Tyrer, also of Melbourne, it was considered, would prove of especial value to India, where so many thousands of dry, sun-scorched plains are traversed by railways, and where the same problem of preventing the escape of sparks—which has so long engaged the attention of the Victorian Railway Department—still remains unsolved. Owing to the heavy nature of their duties, and to the fact that so short a time was afforded for dealing with the vast number of exhibits, the jurors were not in a position to test the invention practically, but the exhibit itself was taken over by Messrs. Burn and Co., of Howrah, one of the largest and most enterprising engineering firms in India, and negotiations are now pending for the general introduction of the smoke arrester into that country. The brass work and irrigation machinery manufactured by Messrs. John Danks and Son also proved of great service in demonstrating the advanced position attained by the manufacturers of Victoria, and so highly was the workmanship and finish thought of that the jurors made two awards to the firm, although in open competition against the world. It may be further mentioned that Messrs. Burn and Co. secured the whole of this exhibit, and also the handsome gasaliers and gas brackets forwarded by Messrs. George Douglas and Sons. The latter firm's gasaliers were a decided acquisition to the court, being suspended close to the main entrance, and over the billiard-table exhibited by Messrs. Alcock and Co. They received a certificate of the first order of merit, and as the number of British and other exhibitors in the same class was very large, the high position taken by the colony must be regarded as especially gratifying. A similar award was granted to two large church or clock bells, cast by Mr. J. W. Horwood, of Castlemaine, and one of them has since been taken for the Lahore Cathedral, in course of construction. The billiard-table and accessories exhibited by Messrs. Alcock and Co. was undoubtedly the finest contribution to the Australian section. It also received the first certificate of merit, accompanied by the gold medal, a distinction it fully merited. The collection of educational appliances contributed by the Department of Education

received a special gold medal, a similar distinction being accorded to the Department of Agriculture and to Mr. Newbery's timber collection, while Baron Sir F. von Mueller, Government Botanist, received two gold medals. Mr. Bosisto received a similar number, while Messrs. Felton, Grimwade, and Co. received no less than three gold, one silver, and one bronze medal for their chemical and pharmaceutical preparations, all of which were manufactured in the colony. Messrs. Swallow and Ariell's exhibits were greatly appreciated, and that enterprising firm received the honour of two gold and one silver medal for biscuits, cakes, and flour. In photography, Mr. J. W. Lindt, of Melbourne, secured the highest honours, and the exhibits from Miss Smith's School of Art Needlework also received the gold medal against the choicest specimens contributed by India, Burma, and Japan.

VICTORIAN WINES AT THE EXHIBITION.

The wines of Victoria occupied the highest position in the estimation of the jurors at the Exhibition, no less than eleven gold medals being awarded to exhibits in that class from the colony. For their better treatment, they had, immediately upon arrival, been stored in a "godown" outside the Exhibition buildings, where they were allowed a good rest of three or four months before adjudication. Most of them turned out clear and bright, and in perfect condition, not more than three per cent. of the samples being unfit for competition. As a sufficient number of bottles of each sample were sent to provide for the wants of the jurors and for extending a general knowledge of Victorian wines, visitors to the court were afforded ample opportunity for making themselves acquainted with the produce of our vineyards. Samples were also forwarded for the acceptance of His Excellency the Viceroy, His Honour the Lieutenant Governor of Bengal, the Commander-in-Chief of the Indian army, the superintendents of the various hospitals, and the stewards of clubs, messes, &c. The wines were in every instance highly spoken of, but in the absence of any central depôt in Calcutta, where two or three cases could be obtained as required, no opportunity, it was pointed out, existed for retail purchasers to replenish their supply. There can be no doubt that a good market is to be made if opened up gradually, but care should be taken to establish a house or depôt where the interests of Australian shippers would be carefully guarded. It occasionally happens that wines and other products are consigned to mercantile houses in India having long-established agencies for British and Continental firms, whose interests are in opposition to the opening up of any new trade in the same direction. The result is that the goods sent from Australia are sent to auction rooms and sacrificed; their real value is not ascertained, and no encouragement is offered for pushing the trade by future consignments. Good clarets appear to be in best demand in India, and for that class of wine there is a fair demand, as it is now the principal beverage at every meal. From 18s. to 35s. per dozen is at present charged in Calcutta for French claret of very inferior quality. The duty is 3s. 4d. per dozen bottles, and freight would probably represent only another 1s. 6d. or 2s., so that a fair margin would be left shippers embarking in the trade. The tasteful manner in which Victorian vignerons and wine merchant now turn out their bottled wines was a gratifying feature at the late Exhibition, and in this respect the colony was specially congratulated by jurors and others who had an opportunity for instituting a comparison with samples forwarded by other countries. The multifarious names under which the wines are, however, exported, again proved puzzling to strangers, and our vignerons would probably find it advantageous to restrict, if possible, the wines sent out of the colony

to, say, half-a-dozen well-known kinds—such, for instance, as claret and hock, tokay and madeira, port and sherry. In the Victorian Court at the Calcutta Exhibition were shown no less than 23 differently styled samples, comprising for the uninitiated such bewildering names as Dolcette, Malbec, Mataro, Pedro Ximenes, Gouais, Muscat of Alexandra, Shiraz, Verdheillo, Aucarot, Carbinet, Grenache, Rousillon, and Sauvignon. Not one in twenty of the ordinary wine consumers in India would select any of the foregoing wines from the labels alone, simply because they would be ignorant of the description of wine indicated. We are satisfied that, if properly pushed, a good and lucrative business could be opened up for Victorian wines in India, but the first condition of success will be the establishment of a house controlled by Australians. Some interesting information respecting the wine industry was given by the President in his lecture, which is appended to this Report.

TRADE BETWEEN INDIA AND AUSTRALIA.

The other articles which could be advantageously supplied to India by Victoria and other Australian colonies embrace preserved meats, tinned fruits and vegetables, hops, biscuits, flour, and other breadstuffs, wool and light woollen goods, leather suitable for harness and general military purposes. All these, and perhaps other things, might not at first form an extensive trade, but, under proper management, the demand would grow largely. There is a very large quantity of copper, tin, and other minerals required in India; the Mint at Calcutta alone obtaining upwards of 200 tons annually from Australia for coinage purposes, while it is being used in largely increased quantity by the natives, who prefer their vessels for all culinary purposes to be of that metal. India has been for many years a good field for Australian horse-breeders, upwards of 2,500 being now shipped from Melbourne every year. The carriage of such a number of horses necessitates the employment of a great many vessels, and this should form a safe and permanent nucleus to a good Indo-Australian trade. The following return, courteously supplied by the Department of Customs, shows the importance of this trade to Victoria :—

RETURN showing the Number of Horses exported to India by Australian Colonies, as under, viz. :—

Colony.	Year.					Value.
	1879.	1880.	1881.	1882.	1883.	
	No.	No.	No.	No.	No.	£
Victoria	2,066	2,461	2,388	3,503	3,678	108,440
New South Wales	Nil	Nil	648	Nil	No return	
New Zealand	Nil	Nil	Nil	Nil	No return	
Queensland	Nil	Nil	10	Nil	No return	
South Australia	Nil	Nil	Nil	30	No return	
Tasmania	Nil	Nil	Nil	Nil	No return	

A. W. MUSGROVE, Collector.

Statistical Branch,
Custom House, Melbourne, July 3, 1884.

S. S. RENNIE.

Back freight is always assured, the exports from India to Australia having grown rapidly of late years. We find that during last year fifteen sailing vessels and three large steamers left Calcutta for Melbourne and Sydney, of a total registered tonnage of over 20,000 tons, carrying the following cargo; and it should be mentioned

that last year there was a marked falling off in the quantity of tea shipped, the decrease on the previous year being over 23,000 chests:—

		Equal to Tons.
Rice, in bags	39,259	3,598
Gunnies, bales	60,501	22,570
Jute, bales	3,648	758
Tea, chests	12,907	1,518
Castor oil, chests	44,296	3,691
Grain, in bags	2,320	175
Linseed, in bags... ..	4,200	308
Sugar, in bags	53	4
Shellac, chests	121	15
Cotton, bales	316	63
Myrabolans, in bags	1,416	104
Ropes, coir ... ..	...	916
Sundries (saltpetre, provisions, oilcakes) ... ..	...	200
Total ... ..	...	33,920

The above figures show conclusively that the effort to improve Indian trade relations with the colony should be made by Australia herself, and it remains, therefore, for those most interested to show the way. There will be no difficulty about getting steamers, provided reasonable inducement is given. Considering the special nature of the trade, and the peculiar conditions of the Indian climate, and the wants of the people, the best thing to be done will be the establishment of depôts in Madras and Calcutta, maintained and managed by Australians, who would have a direct interest in pushing the sale of all products sent forward.

While in Calcutta, the President, at the desire of a number of Australian residents and others anxious to learn something of the colonies, delivered a lecture on "Australia as it is." The chair was taken by the President of the Bengal Chamber of Commerce, and the attendance on the part of the public was very large, showing the warm interest taken in the subject. A full report of the lecture, which was republished in the Calcutta newspapers of the following day, is appended to our Report.

CANALS AND IRRIGATION.

While in India advantage was taken of a tour through the North-West Provinces to inspect several of the canals and other great irrigation works constructed by the Government. Perhaps in no other part of the world is irrigation more urgently required than on the sun-scorched plains of India, where the hand of famine is ever outstretched over the teeming millions of agricultural labourers, who derive their only means of sustenance from small patches of land, averaging not more than two or three acres to each family. These works, designed and carried out by British engineers, form part of one great scheme, which, when completed, will secure for India almost total immunity from those terrible famines which have in past years devastated the land. Some of the canals already constructed are many hundreds of miles in length, and by their agency water is distributed over millions of acres, which, under former circumstances, were comparatively worthless, but are now made to yield two, and sometimes three, crops annually, thereby supporting human life, and adding in a wonderful degree to the material progress and development of the country. The canals of the North-West are nearly all on a gigantic scale, that known as the Upper Ganges Canal being 445 miles in length, with nearly 3,000 miles of subsidiary channels, from which agriculturalists draw their supplies direct. In no other direction is the beneficial influence of British rule in India more evident than in the construction of these great works of utility, for they not only serve as a means of relief to the labouring classes in times of scarcity

and agricultural depression, but they minimize the evil effects of those periodical droughts to which the country is subject, and in some cases actually yield a good profit on their cost and maintenance. Canals are also extensively used for navigation purposes, and in this respect they often become important feeders to railways. In the grain season, especially, the canals are covered with boats of all descriptions bringing down country produce both expeditiously and economically, and in those districts not supplied with railways they prove of very great value. The Upper Ganges Canal is furnished with locks and boat channels at certain intervals, and by the aid of these the navigation of the canal can be accomplished up to its head works at Hurdwar. No finer sight is presented in India than that of the Ganges Canal rolling majestically along in a broad, deep channel, 200 feet wide, for many miles, spanned by handsome bridges, carried under some rivers and over others by means of solidly constructed aqueducts, often 100 feet above the surrounding plains. The water is deliciously clear and sweet, and wherever it flows the appearance of the country at once undergoes a change. The presence of irrigation is nowhere more clearly marked than in India, and no visitor can travel the country without being struck by the immensity of the boon. The Government are keenly alive to the immense advantages of irrigation, and nearly in every part of the Empire works are now being pushed forward. Through the courtesy of the Government, every facility was afforded for visiting and inspecting such canals and other works as lay in our route, and from information thereby obtained we are enabled to give the following short statement of the Upper and Lower Ganges and other canals, which will doubtless be read with interest in this country, where the irrigation question also urgently demands attention:—

From the Irrigation Revenue Report of the Government of India for the year ending the 30th of March, 1882, it will be found that the total capital expended on the canals of the North-West Provinces up to that date was £5,540,000. The net revenue for the twelve months under review was £340,000, equal to 6.13 per cent. on the total capital expended; but as these public works were made with borrowed money, about 4 per cent. must be allowed for the interest, £205,000, leaving an actual surplus after that allowance of £135,000. The area irrigated was 1,916,000 acres, and the value of the crops raised £5,050,000. There were two irrigating seasons. The first was the Kharif season, during the hot weather and rains. The principal crops grown in 1881–82 in this season were—sugar-cane, 165,020 acres; rice, 101,759; indigo, 319,060; and cotton, 63,515 acres. The first three crops, making 83 per cent. of the whole, can only be grown with canal water in a dry year. In the Rabi, or cold weather season, the principal crops raised in 1881–82 were—wheat, 726,332 acres, or 60 per cent. of the whole; barley, 261,602; other cereals, 102,549; and pulses, 77,702 acres. The following table shows the four principal canals in the North-West Provinces for the year ending the 30th of March, 1882:—

Canal.	Length of Canal.	Length of Distributories.	Average Supply passing Head.
	Miles.	Miles.	Cubic feet.
Upper Ganges Canal ... { Kharif } ...	445	2,543	{ 3,406
			{ 3,789
Lower Ganges Canal ... { Kharif } ...	531	1,623	{ 4,129
			{ 3,509
Agra Canal ... { Kharif } ...	140	348	{ 1,040
			{ 1,029
Eastern Jumna Canal ... { Kharif } ...	130	618	{ 1,119
			{ 1,028

The irrigation returns for last year have just reached us, and from these we gather that there has been a further increase during the twelve months of 25 miles of the main canal (Lower Ganges), 159 miles of distributories, and 30 miles of drainage

cuts. The area of land irrigated has also undergone a marked increase, having reached the enormous total of 1,974,175 acres, or 3,085 square miles, being in excess of the year previous by 58,226 acres.

The following statement shows the acreage of the principal crops irrigated during the past five years, the figures being brought up to the end of March, 1883:—

Crop.				1878-79.	1879-80.	1880-81.	1881-82.	1882-83.
Kharye	{	Sugar-cane	... ..	148,060	165,661	135,493	165,019	198,322
		Rice	... ..	80,298	75,903	138,224	107,963	104,046
		Indigo	... ..	227,238	185,001	195,001	319,627	316,145
		Cotton	... ..	74,875	57,471	63,574	64,161	52,493
Rabi	{	Wheat	... ..	587,859	482,703	545,651	727,428	728,385
		Barley	... ..	266,989	210,959	262,139	261,688	266,651
		Grain	... ..	85,236	18,938	34,511	49,851	48,400
		Poppy	... ..	14,613	14,574	17,230	17,140	16,233

There was a remarkable increase in sugar-cane, due chiefly to the good prices prevailing in the previous year, but also partly attributable to the extension of irrigation on the Deoban branch of the Ganges Canal. The area irrigated under wheat and barley again nearly approached one million acres, the actual number being 995,036, or 1,574 square miles, of which 1,138 were covered with wheat, and the remaining 409 with barley.

During last year, 8,679 villages were irrigated from 34,925 outlets in the distributories of the Upper and Lower Ganges, the Agra and Eastern Jumna canals.

In those provinces eight canals were in operation; but the Upper and Lower Ganges canals must be credited with nearly three-quarters of the whole area irrigated. Those two canals had cost to date £4,358,000, and the net revenue from them for 1881-82 was 5.40 per cent. on that capital. The Ganges Canal, designed by Sir Proby Cantley, and opened in 1854, was intended to irrigate the Doab between the Ganges and Jumna rivers; but, the supply of water taken in at Hurdwar proving insufficient, a committee, in 1866, recommended that a new head, or second canal, should be taken out from a spot lower down the Ganges, so as to relieve the Ganges Canal from the duty of irrigating the lower part of its field, and thus to set free a large volume of water, which could be utilized more economically in the upper districts. The preliminary surveys of the Lower Ganges Canal were accordingly undertaken in the end of 1868, Mr. R. E. Forrest being in charge of the operations; soon after, he was succeeded by Captain (now Lieut.-Colonel) W. Jeffreys, R.E., who designed and carried out the greater part of the works. These were begun in November, 1872. In 1878 the works were so far advanced that water was admitted into the first 30 miles, length, and in November irrigation commenced, or exactly ten years after the first levels were taken. Mr. Coddington joined Mr. Forrest's party in June, 1869, and remained on the Lower Ganges Canal until November, 1879. During those ten years he saw the canal in every stage of its development—surveys, designs, alignment, collection of material, construction, and finally irrigation, he having had charge of two large divisions as executive engineer.

The head of the Lower Ganges Canal was fixed by Mr. Forrest at Narora, nearly opposite Aligarh, and the bed-level decided on was that of the cold-weather surface of the water in the river, about 36 feet below the level of the adjoining high ground. During the cold season the water was held up for the canal by a weir across the Ganges, consisting of the weir proper, 3,800 feet long, and the weir-slucies of 42 vents, 315 feet in length. The weir proper was a crest wall of brick-work, capped with stone and crowned with shutters; below was a stone floor, and beyond the floor a talus of heavy material. The foundations were brick-wells filled (after they had been sunk) with concrete. Detailed plans, and descriptions of that weir and other important

works, will be found in reports and plans furnished by us to the Victorian Water Supply Department on the Lower Ganges Canal. The canal-head had 30 vents of 7 feet each, closed with sliding gates. The bed of the canal for the first 26 miles was 216 feet wide, the depth of water 8 feet; the theoretical discharge 4,100 cubic feet per second. The slope of the bed was 6 inches per mile for the first 40 miles. The slope of country was about 15 inches per mile, and the canal commanded country about 50 miles from the head.

The first two miles were laid out in the immediate valley of the river, but between the third and the thirty-second mile the depth of cutting varied from 40 to 15 feet; at the thirty-third mile the canal was carried across the valley of the Kali Nadi by a large aqueduct 190 feet wide at the surface of the water, the river below passing through five arches like tunnels, 213 feet long, of 35-foot span, and having 15-foot abutments. Several other large drainage lines were passed under the canal through masonry syphons, and communications were provided for by over-bridges. Just above the aqueduct there was an escape channel into the Kali Nadi capable of discharging 2,500 cubic feet per second. There were two masonry falls on this channel, one of which had a vertical drop of 14 feet from bed to bed, but of 18 feet from the top of the raised crest.

The first branch left the canal at the twenty-sixth mile, and irrigated the country between the Kali Nadi and the Ganges. The second branch left the main canal at the fortieth mile, and irrigated the Kali Nadi and Isan Nadi Doab. The main channel from the fortieth mile turned south, and joined the Cawnpore branch of the Ganges Canal at Gopalpúr, where there was a regulator; it then continued across the Etamah branch of the Ganges Canal, which it supplied, down towards Bhognipur. Navigation was provided for the main lines, but not on some of the branches, which were primarily designed to supply water for irrigation to the distributories. These distributories varied in size according to the area of the tract which they were designed to serve; a first class distributory was often capable of carrying 200 cubic feet per second. The smallest minors made by Government had 4 or 5 cubic feet discharge. The lesser field channels were made and maintained by the cultivators or landowners. Besides falls, escapes, and all necessary hydraulic works, bridges had to be built about a mile apart on all distributories. With regard to cost, the following table has been compiled from the revised estimate of the Lower Ganges Canal, made in 1876:—

ABSTRACT OF REVISED ESTIMATES OF LOWER GANGES CANAL.

Heads.	Cost.	Percentage.
	£	
Weir	268,000	18.5
Aqueducts and syphon culverts	128,000	6.4
Other masonry works	314,000	15.7
Earthwork (79,000,000 cubic yards)	585,000	27.0
Land	77,000	3.9
Escapes	51,000	2.5
Navigation	52,000	2.6
Drainage	27,000	1.4
Buildings	144,000	2.2
Miscellaneous	47,000	2.4
Maintenance	36,000	1.8
Establishment... ..	316,000	15.9
Tools and plant	98,000	4.7
Total	1,988,000	100.0
SUMMARY OF COST.		
Works, establishments, &c.	1,988,000	86.5
Capitalization of land revenue	102,000	4.4
Interest charges	210,000	9.1
Total	2,800,000	100.0

At that time nearly all the important works were well advanced, and the bulk of the excavations completed, so that the quantities and rates could be taken as representing closely the actual figures. In the last column of the above table is shown the proportion which each item bears to the whole.

On the Lower Ganges Canal, earthworks were constructed departmentally, chiefly by petty contractors, at rates varying from $\frac{3}{4}$ d. to 3d. per cubic yard for basket work, the cheapest being when the stuff excavated was thrown up so as to form the bank without any lead. As a rule, all excess earth was deposited in spoil heaps behind the roadway. These spoil banks were afterwards dressed, and sown with seed of timber trees, and eventually proved very valuable property. Where the digging was heavy in the upper reaches of the canal, recourse was had to tramways and locomotives, and there the cost of the work was 4d. per cubic yard. The most expensive earthwork was raising the Kali Nadi embankment, which had been built up in layers, which were flooded in tanks by steam pumps. There the work cost 6d. per cubic yard. All other embankments were rammed in 6-inch layers, with wooden or iron rammers. The quantity of earth excavated was 79,000,000 cubic yards, and the average cost 1.6d. per cubic yard.

First-class brickwork cost ten shillings per cubic yard; very superior brickwork, where machine-pressed bricks were used, cost fifteen shillings per cubic yard. The prices mentioned do not include the cost of establishment, tools, and plant; but those charges only amounted to 20.6 of the estimates, so that the prices per cubic yard quoted had only to be increased to that extent in order to exhibit the total cost to Government for each sort of work. When all the distributories are completed in the Upper and Lower Ganges Canal system, the principal figures will be something like the following:—Length of canal, 1,000 miles; length of distributories, 5,000 miles; cost, £5,000,000 sterling; combined full supply, 11,000 cubic feet of water per second; area commanded, 2,500,000 acres; probable area irrigated yearly, 2,000,000 acres; average water rate, 4s. per acre; giving a revenue of £400,000, or 8 per cent on the cost of the works.

Speaking of one of the districts irrigated by the Ganges Canal, Professor W. W. Hunter writes:—"The district of Cawnpore forms part of the Doab, or great alluvial plain between the Ganges and Jumna; and it does not materially differ in its general features from other portions of that monotonous tract. It consists for the most part of a level plateau, only varied by the courses of the minor streams, whose waters swell the great boundary rivers, and by the steep ravines which channel the friable soil of the plain. The country has a slight general slope toward the southwest, and all the channels trend in that direction. It is divided into four main sections by the streams which collect and carry away the surface drainage. The Isan cuts off a small angle to the north, joining the Ganges shortly after its entry within the limits of Cawnpore; next come the Pandu and the Rind, which traverse the midland portion of the district from end to end; while, to the extreme south, the Sengur falls into the Jumna, and encloses between itself and the main stream a triangular wedge of land. The banks of the two last-named rivers are marked by extensive ravines of great depth, which ramify in every direction from the central gorge. Their soil is almost uncultivable, and they have a wild and desolate appearance, contrasting strongly with the rich and peaceful aspect of the cultivated country above. The clay of the upland plain is naturally dry and thirsty, but it has been converted into a prosperous agricultural region by the waters of the Ganges Canal. No fewer than four branches of that great engineering work enter the district of Cawnpore at different points, while minor distributories run from them in every direction over the surrounding fields. The

plain is now one of the most flourishing portions of the Doab, and only an occasional strip of usar, whitened by the efflorescence known as reh, breaks the general prospect of cultivated fields. No lake of any size exists in the district, but a few small patches of water are formed by the overflow of the canal. After the rains, the lower levels are occupied by shallow ponds, particularly where irrigation trenches connected with the Ganges Canal intersect the natural lines of drainage, thus producing a temporary dam; but the pools which collect under these circumstances are soon drained dry by the cultivators to water their fields."

The system of regulating the water rates is very simple and equitable. A cultivator gives notice to the assessor or other officer in charge of the district that he proposes sowing so many acres with maize, wheat, indigo, sugar-cane, or other crop, and that he will require a certain number of waterings during the season of growth, according to the character of the crop, from the nearest distributory or sub-canal for irrigation. Some crops require more water than others, and differential rates are consequently charged. Every person using the canal water knows exactly how much he will have to pay beforehand, and, as no complications are possible, the system readily commends itself to the native mind.

In other parts of India different schemes of irrigation are in operation, but the time at our disposal was too limited to admit of an extension of our visit beyond the North-Western Provinces. Enough was seen there, however, to convince us that the Indian Government is carrying out a great and noble work, which has already conferred incalculable benefits upon the people, and which will in the future tend to increase the material progress and development of the Empire in a manner unparalleled in its previous history.

We cannot leave this part of our Report without expressing our warmest thanks for the great courtesy and attention which we received at the hands of the officers of the Public Works Department of India, particularly Colonel Brownlow, R.E., Deputy Secretary and Inspector-General of Irrigation, who furnished us with all information respecting the canals and how to see them, and also arranged that the officers in charge of the different works should afford us every assistance in their power. From Mr. W. Ward Smith, executive engineer in charge of the Upper Ganges Canal head works, Colonel Coape-Smith, Mr. Duthie, Superintendent of the Botanic Gardens at Saharanpur, and Mr. Harrington, collector at Saharanpur, and Messrs. Good and Atkinson, of the Lower Ganges Canal, at Narora, we received much information and assistance during our tour in the North-Western Provinces, and our thanks are also due to the gentlemen named for the hospitality which they extended towards us on the same occasion.

ECONOMIC PRODUCTS OF INDIA.

One of the most interesting and useful features of the late Calcutta International Exhibition was the admirable manner in which the whole of the economic products of India were displayed in the Economic Court. Every care had been taken to make the representation of each article as complete as possible. If it were a fibre-yielding plant, known or unknown in commerce, it was displayed not only in its raw state, but also, in very many instances, in its varied indigenous and European manufactures and uses. The same may be said of the dye plants, the tans and mordants, the foods, food stuffs, and fodders. The materia medica of India was there in all its strength, and the timber display was very effective; the whole of this department being under the able direction and control of George Watt, Esq., M.B., of the Bengal Educational Service.

The evident desire of this department is to obtain a thorough knowledge of the value of every plant indigenous to India, and to point out its utilitarian uses, if of

a prominent character. The labours of the Government Botanists of India and others employed in the Department of the Educational Service, and the yearly advance made by them in developing new products, must result in specially benefiting that country before a decade passes, both in extending her own manufactories as well as in her exportation of the manufactured and raw materials.

FIBRE-YIELDING PLANTS.

The fibres from the fibre-yielding plants indigenous to India attracted considerable attention. They may be divided into those adapted for cordage, for textile fabrics, and for paper. Jute fibre has become a favorite in each of these industries. Dr. Watt observes—"That for a long time the difficulty of bleaching seemed insurmountable, and the trouble experienced in dyeing the fibre appeared likely to nullify every effort to utilize it. These stumbling blocks have been removed, and there cannot be a doubt that, but for the want of durability, jute would soon rank as the most valuable of all fibres." The plan adopted of separating the fibre by "setting"—that is, soaking it in stagnant water—weakens the fibre very considerably. Could a simple machine be invented for the purpose of extracting the *dry* jute fibre, its value and use would be augmented considerably. The jute mills in and around Calcutta are very large. Forty years ago the gunny-bag trade was entirely in the hands of the Indian peasants. To-day "there are 19 factories, having 5,464 looms and 87,071 spindles, and they give employment to 21,089 men, 9,519 women, 4,254 young persons, and 2,719 children." These people work in two three-hour shifts daily, and the wages average from two to eight annas daily, equivalent to 2½d. to 10d. per day.

The native Indians weave three kinds of jute cloth, viz., gunny-bag cloth, cloth for sails of country boats, and cloth to sleep on. They also make ropes and twine from jute. It is now largely used in the European manufacture of carpets, curtains, and shirtings. It has been applied extensively as a substitute for hemp. For this purpose, the fibres are rendered soft and flexible by being sprinkled with water and oil in the proportion of 20 parts of water and 2½ parts of whale or fish oil to 100 parts of jute. Sprinkled with this, the jute is left for from twenty-four to forty-eight hours, when, after being squeezed by rollers and heckled, the fibres become beautifully soft and minutely isolated, and thereby suited for a number of purposes unknown a few years ago. It is also mixed with silk or used for imitating silk fabrics.

The fibres used for ropes and twine need not be referred to, as they are generally well known.

The increasing demand for paper throughout the civilized world, and the scarcity of rags and waste paper, has directed the attention of paper-makers to raw fibres. The abundance of fibre-yielding plants is well known, but the great want, and, we may add, absolute need of the paper manufacturers, especially in Australia, is to obtain a material in quantity and at a cheap rate, if they are to compete successfully with the cheap and good trade productions of Europe.

The samples of native-made papers from Indian fibres exhibited in the Indian Court, although hand-made, and made coarsely in comparison to machine paper, gave nevertheless good evidence of the adaptability of many of the fibres employed for making good paper.

The native appliances are primitive in character, and the manner of working the fibre into pulp does not help to improve either its colour or cohesion. Like many of their other industries when not under European supervision, that of paper-making remains stagnant, the native mind having no desire for improvement or for anything new.

Some of the fibres which are to be obtained in Bengal in large quantities are those of the jute varieties, bamboo, rice straw, hemp varieties, refuse of the sugar-cane, cocoanut, and the other palms, and also the American aloe. Some of these have been submitted to the paper-makers of England and elsewhere, but in most instances a fair opinion has not been obtained, owing to careless packing and the rough manner employed in collecting and preparing the plant for exportation. The Bengali peasants within the last two years have gone out of the usual track of the Indian native by adopting a simple, and yet ingenious, and also cheap, hand sugar-crushing machine, made by a European in India. It completely crushes out of the cane the whole of the moisture without injury to the fibre. This will enable them to pack into a small compass the refuse cane; and, moreover, if this machine were employed to reduce to the same condition the green succulent stem of the bamboo, there would be another fibre for paper-making in endless quantity. Mr. Routledge, a gentleman whose researches have been very extensive on various fibrous substances, states—"That he has no reason whatever in any way to alter his firm and strong opinion that bamboo, as a paper-making material, admits of no rival, and is a sound industry in all its details."

The bamboo does not require the elaborate preparatory manipulation to separate the fibre from extraneous or woody matter, like some of the other fibrous plants. Mr. Routledge further remarks that—"As the dry stems yield 60 per cent. of unbleached paper stock, dried and baled up in merchantable condition, we have a yield of six tons merchantable fibre per acre, an enormous product as compared with other fibres." Such stock being then dried rapidly by the machine mentioned, the fibre would undergo no injury, and would be immediately ready to be baled up in a compact form like jute or cotton, requiring only soaking down and bleaching to fit it for pulping and conversion into paper.

Munj grass (*Saccharum munja*) is coming into prominent notice as supplying a good paper fibre. Dr. Watts states that this plant constitutes the best paper-grass material of India. It is very abundant in the Punjab, often covering whole tracts of country. A specimen of this grass can be seen, with the other Indian exhibits, in the Technological Museum, Melbourne.

It seems strange that, amidst the endless variety of plants suitable for paper-making in India, no special one for the production of a colourless pulp had, up to the date of the Exhibition, been declared. Experiments are still being conducted in Calcutta on some fibre-yielding plants, with the view, if possible, to obtain such a desideratum. Some hope was expressed before we left India that the experiments now being made on the fibrous rootlets of the rice plant would prove successful in this direction. If so, the supply would be unlimited.

THE WILD SILKS OF INDIA.

The silk and silk-worm exhibits in the Indian Technical Court were very complete, setting forth the many varieties of worm now to be met with throughout India, and the extension of silk cultivation. Those specially interesting were from the wild silk-worms of India, two species in particular, viz., the *Eria* silk-worm, termed "*Attacus ricini*," and the Tusser silk-worm, termed "*Antheræa paphia*;" the former is a worm which feeds on the Palma Christi, or castor-oil plant, chiefly, and produces a cocoon about the size of a walnut, supplying silk both fine and durable. The ease with which the ordinary castor-oil plant grows in Victoria should make this silk-worm deserving of attention; the latter—that is, the Tusser silk-worm—is the most widely

distributed, and the most important of the wild silk producers of India. This caterpillar is not confined for food to one particular family of plants, like the mulberry feeding silk-worms, and appears greatly to adapt itself for food to the leading vegetation of a district where it becomes allocated. It feeds, in India, variously on the country almond (*Zizyphus jujuba*), the teak (*Tectona grandis*), the Myrobalans or Terminalia varieties, the fig or *Ficus* varieties, the castor-oil leaves, and numerous other shrubs and trees. This Tusser worm also seems to have a keen relish for any vegetation whose leaves are slightly of an astringent character; during the months of November and December of last year, this caterpillar was to be met with in and around Calcutta on the wild plum trees, termed khouri. The worms varied in age and size, from a few days old to the full grown; this circumstance gave us the opportunity of becoming acquainted with its daily habits and growth, until it closed itself within a cocoon. These observations, together with the information obtained, impressed us favorably with the idea that this Tusser species was worth a trial in Victoria, for domestic, as well as for out-door cultivation. Tusser silk is stronger than mulberry fed silk. "In the Central Provinces cloth is made of cotton warp and Tusser weft, so in this case Tusser silk would be the weft silk in shuttle silk."—(Wardle.)

This silk-worm is more particularly noticed on account of the great probability that many of our indigenous trees and shrubs might be found available for their food. In some parts of India they are known to live on the Casuarinæ; some species of this genus are native also of Victoria. Our wattles and fig varieties might also prove available. The Tusser will also live on the castor-oil plant. The seeds of many of the Indian trees mentioned previously as providing food for this caterpillar were collected, and since our return have been distributed.

The fibre of this silk is flat and not round, as it is in the mulberry silk; it is brown in colour, and stronger than other kinds. It would be interesting, and possibly advantageous, to try the Tusser for the first season in domestication, in order to study any new peculiarity that might arise under somewhat altered clime and other circumstances. Under domestication, the trouble would be very slight, the chief points being to give *fresh* leaves (not wet) once or twice a day, to keep them clean, removing the dead, if any, and to give them fresh air under a moderate temperature, avoiding sudden changes.

But it would be specially interesting to try the cultivation of this industry out of doors. The winter climate of North-Western India, both in the jungle and forests, appear to have surroundings of a kind, both in temperature, humidity, and altitude, in many respects similar to those places in Victoria where the vegetation is fairly dense. The natives generally collect the cocoons in the jungles, but, from the latest report on Tusser culture, dated January, 1880, from Major Coussmaker, we find that this gentleman has established, at Poonah, a breeding establishment, and has planted many young trees for feeding the worm. He says it thrives well on *Lagerstroemia indica* (the leaf is mildly astringent), an ornamental shrub fairly abundant in the cantonment of Poonah. He has changed his plan of feeding them on "cut twigs brought to them in captivity, and allows them, carefully watched, to feed in the open air on the growing shrubs. This was an evident change for the better; the larvæ moulted in four or five days, instead of five to eight days; they spun their cocoons in 27 to 30 days, their eggs proving more fertile than under the former plan;" he fed them also on other shrubs.

Much attention has been given during the past few years to the production of Tusser silk, with a view of making it as systematic an industry as that produced by

the mulberry silk-worms. Wardle, on the Wild Silks of India, states that the enthusiastic labours of the French, aided by their Société d'Acclimatation, have succeeded in domesticating, if not in almost naturalizing, several eastern species of wild silk producers, and in obtaining from them silk of industrial value. If in France, why not in Victoria ?

"The worms require protection from birds and ants, which are their greatest enemies. The Tusser worm, in spinning his cocoon, takes short sweeps of his head from side to side, depositing the silk very closely in parallel fibres as he does so. It has been thought that the worm twists the silk as it exudes it, but this is not the case. Besides the gum which coats the silk, the worm secretes at intervals a cementing fluid, which it kneads by an expanding motion of its body through the whole cocoon to consolidate and harden it. This cement gives to the cocoon its drab colour. The cocoons vary very much in size. The largest I have seen are from Sambulpoor, and are 2 inches long and $1\frac{1}{4}$ inches in diameter; the weight of the large cocoon is, without the pupa and supporting pedicle, 28 grains. I have an unbroken thread reeled for me from one cocoon; it weighs 12 grains, and measures 1,332 yards, or a little more than three-quarters of a mile."—(Wardle.)

With reference to the Indian life of this worm, Major Coussmaker remarks:—
 "As a rule, there are certainly two crops in the year; the moths of the first batch come out in about four or six weeks after the first lot of worms (which come out at the commencement of the rains) have spun; those of the second batch remain quiescent until the rains begin again—that is to say, until May. As this entails the chrysalis remaining in the cocoon as long as eight months, exposed to the hottest sun and occasional thunderstorms, the cocoon had need to be made of a hard, impenetrable material; so indestructible is it that Bheals, and other tribes which live in the jungles, use the cocoon as an extinguisher to the bamboo tube in which they keep the "falita," or cotton-rope tinder, used by them for lighting their tobacco and the slow matches of their matchlocks. The cocoon is also cut into a long spiral band, and used for binding the barrel of the matchlock to the stock, being, as the natives say, unaffected either by water or fire. The cocoon consists of two kinds of silk; what it first spins is reddish, and of this the pedicle and outside network is made. This silk consists of threads of different lengths, but the rest is generally unbroken from beginning to end. . . . After the caterpillar has spun a layer of silk thick enough to conceal itself, it discharges some kind of gum or cement, thick and white like plaster-of-paris, and then, with its muscular action, it causes the gum to thoroughly permeate the whole cocoon and solidify the wall. In this manner it goes on spinning layer after layer of loops, and cementing them all together until the whole of its silk is exhausted, and the wall of the cocoon becomes so hard that it requires a sharp penknife to cut through it. The ring at the end of the pedicle, which has been spun round the twig, is a most necessary provision of nature, for it often happens that, either the caterpillar has been unable to attach its cocoon to a leaf, or that, during the long time the cocoon remains unburst on the tree, the leaf or leaves to which the cocoon was at first attached become separated from it, and then the cocoon hangs suspended from it like a berry."

After eight or nine months in the pupa state, a moist spot is observed at one end of the cocoon. The moth is now about to emerge both from its pupa shell and from the cocoon. It secretes a fluid which softens the cement of the cocoon, and enables it to separate the fibres sufficiently to allow its creeping out, it being, no doubt, assisted in this by its short pointed spines. Professor Church is at present engaged in the investigation of the nature of this softening fluid. The head of the moth first appearing with its antennæ, broad in the male and narrow in the female; thus enabling the observer to

note the sex, and to put them in pairs. The male moth generally flies away the night of his exit from the cocoon, after his wings become extended and dried. The female rarely does, but during the first three days of her existence she lays her eggs, which hatch in about twelve days afterwards. The new life of the moth does not extend to more than eleven days. As will be seen from specimens brought back with us, the moth is a fine, handsome insect, measuring across the wings about 6 inches in the male, and about 5 inches in the female. The vitreous and transparent wing spots, similar to those of the Atlas moth, will be noticed. These spots are regarded with superstitious reverence by the natives, who see in them a resemblance to the chakra or discus of the god Vishnu, and are therefore induced to consider the moth a sacred insect.

It remains now only to explain how the cocoons should be dealt with when obtained. The cocoons will be known to be completed by the absence of any sound within. The first care will naturally be to select a sufficient number for breeding purposes. Many of the silkworms die before the completing of the spinning of the cocoon. These are, of course, no use for the present purpose. They may be distinguished generally by their being smaller, and in an incomplete condition, and by a hollow sound they yield when gently tapped. About an equal number of males and females are usually selected. The females may be generally distinguished by being larger than the males, and of a more symmetrical shape. The males have cocoons somewhat irregular in shape, as if pinched at one end. These are kept together in suitable places until they burst into the moth. The eggs are generally laid in one or two days, after which the moths die.

In the case of silk-worms which have been classed as wholly domesticated, neither in the stage of the moth, nor in that of the silk-worm, is there any tendency to roam. But in the case of the partially domesticated worms, some care has to be taken to provide against this tendency, while, at the same time, the moths must not be frightened by too severe restrictions.

The difference in the colour of cocoons, in the case of cocoons of the same silk-worm, is known to be due partly to the local influence of climate, and largely to the food which the silk-worm eats. A general point to observe in silk-worm raising is that silk-worms of as nearly as possible the same size and strength only should be allowed to feed together. If this rule be not observed, the stronger silk-worms will bully the weaker, and deprive the latter of their food.

Specimens of the moth, the cocoons, and the silk, as reeled by the natives of India, we have forwarded to the Technological Museum, Melbourne, where they may be inspected by those interested.

INDIAN WHEAT AND OTHER FOOD CROPS.

The grain crops of India are very numerous, consisting chiefly of wheat, barley, Indian corn, rice, and the almost endless pea varieties. Very little waste land is to be seen; the density of the population being so great seems to demand the cultivation of every inch of ground, the ordinary average ranging from 600 to 1,000 souls per square mile. That which is of paramount importance to these people is either rain or irrigation; in those districts where both are absent, a traveller is struck with the labour and patient endurance of the rayats (tillers of the soil), continued week by week, in raising water from a well, and spreading it over their fields by means of gutters, for the purpose of growing just sufficient grain for their families between the seasons, of which there are at least two every year. It is stated by Dr. Hunter, in his Statistical Account of Bengal, that the household of a rayat, consisting of six members, whose

ordinary food consists of coarse rice, pulses, dried fish, and common vegetables, would cost him fifteen shillings a month.

The system of canalization and irrigation, referred to more fully in another part of the Report, has so changed the face of nature in many districts that, notwithstanding the vast population, food material sufficient for present wants is not only supplied, but the granaries are kept stocked for another season in case of some unforeseen failure occurring.

The use of irrigation is almost entirely confined to sugar-cane, indigo, Indian corn, and other food crops, where the population is dense, but in the vast level lands of the Central and North-Western Provinces, and Oudh, where wheat is greatly grown, and the population not so dense, some parts are under the irrigation system, and is still extending. The growth of wheat in these districts, together with the Punjab, is something enormous. Travelling through this country in a railway train, for more than 24 hours, and at the rate of 25 miles per hour, the eye rests on nothing but wheat fields, all healthy and strong in appearance. Much of the Indian soil is suitable for growing the most valuable descriptions of wheat, and that, when more attention is paid to the sowing a clean seed of the "soft wheat descriptions," it is said in a late report on the shipments of Indian wheat to England, that it would "always command the top prices of the day."

TIMBER TREES.

Like many other countries of the world, India is manifesting much concern in the work of forest conservancy and extension. With a territory so vast, and jungles so extensive, it is surprising to find such a dearth of timber belts; this must have been the case for many centuries. Throughout the vast ruins of ancient cities and buildings now visible, we find that marble or granite took the place of wood wherever possible, as in the case of floors, stairs, and roofs. The thousands of villages scattered over the plains of India are built of mud with bamboo bindings, and the roofs thatched with rice straw. The chief article for fuel is dried cow-dung, and yet timber trees, indigenous, of no mean proportions, are to be met with in their forests, situated in the hill districts and mountain fastnesses; the difficulty of access, even at the present time, prevents their being available to any great extent for building and other purposes. Great effort is now being made by the Government of India to extend her forest lands and to stock them with trees both native and foreign, besides laying down plantations over the irrigated plains and the planting of trees along the banks of the canals. It is everywhere apparent that, until timber becomes more plentiful throughout the Empire, the habitations of the poorer classes will not improve, neither will the soil receive that recuperative power of the article now so generally applied for fuel.

The total area under the control of the Forest Department is steadily increasing; in 1873 the area was 120 square miles, and in 1883 it was 4,322 square miles, equivalent to 2,766,000 acres.

Forests are classified as "reserved" and as "open." The reserved forests are those under the immediate control of the officers of the Forest Department, and are managed as the property of the State with a view to their conservancy and future development as a source of wealth; their limits are demarcated after survey; cattle are excluded from grazing, and the hewing of timber is placed under stringent regulations.

The open forests are less carefully guarded; but in them, also, certain kinds of timber trees are preserved. A third class of forest lands consists of plantations,

on which large sums of money are spent annually with a view to the rearing and development of timber trees.

The teak is the chief timber of India. It is used for all purposes of house and ship building, for bridges, sleepers, furniture, and for other purposes. It is rarely attacked by the white ant.

The terminalia or myrobalan trees are employed in buildings, agricultural implements, carts, boats, plough shafts, and planking. A great variety of other kinds could be mentioned as being employed, but the scarcity has become so great that some of the chief woods employed for general purposes are imported.

Particular interest was paid to the timber trophies of the Australian Courts, and every inquiry made as to the capability of Australia in supplying the Indian wants in this respect. The attention given to the growth of non-indigenous trees throughout the forests under control is very great. Every year special reports are forwarded to the Forest Department from the caretakers, who have separate charge over the rearing and growth of each particular kind. The report on the growth of the Eucalyptus in the plantations and forests of last year occupies 44 pages of closely printed matter, minutely entering into every particular which seems to indicate the places best adapted for a vigorous and healthy growth. The area extent for the growth of the Australian gum trees, and also the wattles on the Nilgiris, the sub-Himalayan, and the Himalayan forests, occupies many thousands of acres. No expense is spared in striving to grow the valuable timbers of other countries. Many are now succeeding, and, where failure occurs, the reason is notified by the caretaker, and criticized fully by the Forest Department.

CULTIVATION OF THE CINCHONA.

The cinchona plantations established in a valley of the Himalayas, in the district of Darjeeling, has attained great success. In 1877 the total number of cinchona plants, cuttings, and seedlings amounted to 3,817,192; in 1883 the number had increased to 4,711,168. The bark crop of the year was 396,980 lbs. weight, and by far the largest portion of this produce was made over to the Government factory for conversion into febrifuge.

With regard to the climate suitable for cinchonas, says Dr. King, of the Seebpoor Botanic Gardens, it may be laid down as a rule that none of the medicinal species will stand frost. They prefer rather a cool climate, in which the contrast between summer and winter, and between day and night temperatures, is not very great. At Ootacamund, about 7,500 feet above the sea, the minimum lowest temperature in the shade, calculated on an average of the three years, is about 49°, and the maximum 69° F. The altitude and temperature here given appears to be suitable for some species of cinchona; but, for those now in special favour, such as the *Calisaya ledgeriana*, a more congenial climate is indicated at an elevation above the sea from 1,000 to not more than 2,556 feet; the minimum lowest temperature is there given at 40°, and the maximum at 94° Fahr.

Cinchonas appear to find a congenial home in valleys uniformly moist, but not subject to heavy rainfall. Past experience in India is that "their most vigorous growth is during these seasons in which sunshine and showers alternate." Dr. King further adds—"That all the species are most impatient of stagnant moisture at their roots, and therefore require an open subsoil, a sloping exposure, and the other conditions of perfect drainage. They cannot be got to grow on flat land. Like most other plants, they prefer a rich soil; and, for this reason, they do better in newly cleared forest than in grass lands."

The repeated assertion made by Baron von Mueller, that some of our valleys in the Dandenong Ranges are well adapted for the growth of cinchonas, is fully borne out by the Indian reports as to altitude, climate, rainfall, soil, and aspect, and also by our own visits and observations made where the cinchonas are grown in some parts of India, and also in Ceylon.

Since our return we have received from Darjeeling, per J. Gummie, Esq., this year's seed of the *Calisaya ledgeriana*. It has been distributed to the Melbourne and Ballarat Botanic Gardens, to the Department of Agriculture, and other institutions. Persons desirous of obtaining samples may obtain them on communicating with the President.

TANNING.

As far as could be ascertained, the usual processes of tanning hides and the smaller skins in Bengal in the European tanneries are similar in most instances to those usually adopted in the tanneries of other countries; but, in the chief Government tannery, which is situated at Cawnpore, more time is taken in completing the tanning than that usually taken in ordinary tanneries. This arises chiefly from the fact that the Cawnpore leathers are not brought into commercial competition, as they are solely intended for the army and the other branches of the Indian service.

The leathers shown at the Exhibition from Cawnpore were hides of buffalo, bullock, and cow, together with skins of smaller animals. These were well tanned and well finished; the grain side assumed a bright buff colour, derivable from the materials employed during the process of tanning. The leathers were firm and yet pliable, evidently the "dubbing" had been well worked in. The barks, leaves, and fruits indigenous in India for tanning purposes are numerous; but, apart from the native tanneries, where leathers are only produced for the light leather necessities of the Indian, the chief tan materials employed are the following:—

- The Babul bark (*Acacia Arabica*),
- The Mohwa bark (*Bassia latifolia*),
- The Sal bark (*Shorea robusta*),
- The Mangifera bark (*Mango*),
- The fruit of the *Terminalia* varieties,
- The leaves of the *Phyllanthus Emblica*.

A variety of other tree or shrub products are employed in certain localities, but they contain weak tan constituents, their chief use being for colouring purposes.

The native tanners appear to have a wonderful knowledge of the adaptability of quantity of certain dye plants in unison with tan materials for the production of light-coloured leathers. At the Cawnpore Government tannery the labourer is the Coolie, under the direction of a few Europeans. They still adhere to the mixtures of tan and dye materials as followed by the native tanners; but, from some cause, the brightness of the colour is inferior to that of the latter.

The native tanning process varies slightly from the European; for instance, that which is known as "puring" or "plumping" is absent. Hides, after being limed and fleshed, are soaked in rice-gruel for a few days, and then exposed to the sun to dry. Another instance: the skins, after being fleshed, are steeped in water for three days (the water being changed every day); they are then soaked in a solution of pigeons' dung. One seer of pigeons' dung is dissolved in water just sufficient for steeping four ordinary buffalo or bullock skins; in this solution the hides are soaked for twenty-four hours, after which they are washed, and squeezed out so as to free them from water; the Indian process of tanning then begins. The native shoemaker rarely

advances beyond the manufacture of the slipper shoe, both in plain and ornamental work. The native harness maker attends in chief to the trappings required for the camel or trotting bullock. The leather, although strong, is very different in finish to the European.

TAN MATERIALS.

Nothing seems to surpass or even to equal the wattle bark of Victoria for general tan purposes, although, as far as our observation went, very little of this is used in Bengal. The nearest approach to it in use in India is the *Acacia Arabica*, or the Indian gum arabic tree, a species of wattle; the bark of this tree is extensively used in all their tanneries, and is known commonly under the name babul bark. This bark, used alone, tans leather a buff colour. The seeds, pods, and leaves are also tan materials employed occasionally. This tree is common everywhere in India, and grows about the size of our ordinary wattle. Baron von Mueller, in his work on "Select Plants for Industrial Culture in Victoria," recommends this tree for cultivation. We obtained this seed, and have distributed it. The mohwa bark and the sal bark are much used, especially the latter, but is generally employed along with myrobalans. The mango tree bark and the mangroves are met with in some of the hill tanneries.

The *Terminalia* genus is full of interest to all engaged in the manufacture of leather. These are the trees which produce the plum fruit trees known as "Myrobalans" of commerce. They are largely employed for tanning and for leather dye purposes throughout the Bengal tanneries. They have also become an article of considerable export. There are several species or kinds. Some sorts are very weak in tan power, whilst others are very strong. These elegant trees are met with in large numbers in the hill districts, and in several places on the plains, several kinds growing together. They yield abundantly the myrobalan or plum-nut. When the fruit is in a fresh state, the species can be fairly defined; but after the soft outer portion of the plum has become dry and shrivelled there is great difficulty in distinguishing between them; hence exported myrobalans often contain several species mixed together, both strong and the weaker sorts, greatly to the detriment of the importer and also to the tanner using them. About eight kinds of true myrobalans are known in India, and two or three from another genus termed Emblic myrobalans. The best kind of myrobalans for tanning is botanically termed *Terminalia Chebula*, known in Bengal under the name of Haritaki.

One kind, of medium strength, is termed *Terminalia belerica*; in Bengali—Bohua. Another, of similar quality, *Terminalia citrini*; in Bengali—Hara.

The weaker sorts are *Terminalia arjunæ*; in Bengali—Arjun. *Terminalia tomentosa*; Bengali—Piasal usan. *Terminalia Catappa*; Bengali—Badam. *Phyllanthus Emblica*; Bengali—Amla or Emblic myrobalans.

There are two or three other kinds, but there is little known about them, as their habitation is merely local. Myrobalans, it must be remembered, are used not only for tanning but for colouring leather. The above are given in the order of quality for tanning.

MYROBALANS FRUIT.—DESCRIPTION.

There is a great difficulty in correctly describing the several kinds of myrobalans when in a dry state, although in drying, the soft plum material, which is the tan and dye substance of the myrobalan, follows to some extent the furrowed lines of the nut inside; yet there are many variations arising from the outer conditions when drying.

The chief outside characteristics are certainly, 1st, in the formation of the myrobalan, and, 2nd, in its colour. At times even an expert would find it a difficulty to decide; but these two characters will aid materially in judging a sample of myrobalans together with the following description of the fruit:—

Terminalia Chebula.—From $\frac{3}{4}$ to $1\frac{1}{4}$ inch in length, having a broad base, fining off to a roundish point, more or less, 5 ribbed, well marked; in colour either a light or dark brown with yellow lines or spots.

Terminalia belerica.—Not more than $\frac{3}{4}$ of an inch long; in shape a roundish ball narrowed into a short stalk, very slightly ribbed, in some instances smooth. Colour, appearing like a dark underground of gamboge slightly covered over with brown umber.

Terminalia citrini.—This myrobalan is very like the *T. Chebula*; in length a little longer; it is oblong and lanceolate; colour like a citron, with dark spots scattered over it.

Terminalia arjuna.—Used more as a dye, and cannot be used in the adulteration of *T. Chebula*; the fruit is from 1 to 2 inches in length, having 5 or 6 wings attached of a deep yellow colour.

Terminalia tomentosa.—This myrobalan is covered with a dense white-brown down, and is the main feature from the other terminalias.

Terminalia Catappa.—From 1 to $1\frac{1}{2}$ inch in length, ellipsoid, slightly compressed so as to show two ridges; a very dark brown in colour.

Emblie Myrobalans.—About the size of a marble, and round, with a short stalk at its base; altogether very much like a round compressed pine cone.

The myrobalan trade from India might possibly become an article of large import, provided the quality of the article could be relied upon; we therefore paid special attention to this subject whilst in India, and we hope the information here given will aid our tanners in purchasing a reliable myrobalan.

There are many leaves, seeds, and pods employed in India for tanning and colouring leather. The leaves of the Emblie myrobalan are regarded, says Dr. Watt, as one of the best tans by the Bengal charman (native tanner). It is worth here repeating that our Government Botanist, Baron von Mueller, pointed out some years ago the value of our wattle leaves for tanning skins a light fawn colour. Leaves of many of the Indian trees are so used. The *Acacia* legumes or pea pods are very abundant, varying from six to twenty-four inches long, are also employed as tan materials. One in particular was specially referred to by one of the Indian experts to the effect that, if the Victorian tanners would combine a certain pod with the wattle of Australia, they would produce a leather, both in substance, colour, and finish, superior to all elsewhere. The special legume referred to was that from the *Divi Divi* (a *Cæsalpinia*). How far this information may prove valuable it is left for the tanners to determine. We obtained the seeds of this tree, and distributed them to the Agricultural Department, and to the other societies associated for the growth of trees.

DYES FOR LEATHER.

The information obtained with reference to the dyeing of skins in the native tanneries is a little uncertain, but the prevailing opinion is that the skins are dyed and tanned together. Although the dyes from tar products have materially changed the old dye materials and processes, yet in many parts of India the vegetable dyes are still adhered to, the native tanner maintaining that for leather they are more durable and softer looking in the several rays of colour.

Dr. Hugh McCann, of the Bengal Educational Department, in August of last year forwarded to the Government a report on the dyes and tans of Bengal. Certain formulæ are given for various colours, which we here quote, premising that where the vernacular names are used we have also given the botanical name, so as to fix the plant, should any of the forms be deemed worth consideration by the tanners of Victoria.

Red.

Bark of Garán.—Skin is dyed red by being kept steeped for eight days in water in which the bark of garán is soaking. The bark is sometimes boiled in water, and the skin kept steeped in this.

Leather tanned, as described above, by bark of garán, has acquired a reddish-brown colour. Of this the common native shoes are made.

Barks of Bakul, Garán, and Jám.—Another mode of dyeing skin red is to steep it in water in which the barks of bakul, garán, and jám have been soaked.

Barks of Porashi and Asun.—A mixture of the barks of porashi and asun produces a very good red dye in favour with tanners. The red leather shoes worn by the people owe their colour to this dye.

Bark of Gatheyas.—Leather tanned with this bark, as described above, is red.

Yellow.

Barks of Deuch and Madar.—Skins are dyed yellow by steeping in water boiled with the barks of deuch and madar.

Leather tanned with garán and haritaki acquires a yellow-almond colour. The preparation of haritaki is as follows:—First soak the fruit in cold water for about six hours, then throw out the water and fill with fresh. Then boil for about an hour until the fruit becomes soft; then throw out the boiling water and wash the fruit in cold water, to take off all infirmities; after this it is reduced to fine pulp, and mixed in the proportion of one and a half of garán to two parts of haritaki.

Black.

Barks of Sidha and Ashna.—Skins are dyed black by steeping in a preparation of water and the two barks mentioned.

Haritaki and Blue Vitriol.—Another mode is to steep the skin in a preparation of haritaki and blue vitriol.

Another mode is to steep haritaki with sulphate of iron; gives a good black; used by harness makers.

Green.

Green for dyeing skins is obtained by steeping chloride of ammonia in a copper pot.

Purple.

Skins are dyed purple by first dyeing them red, as above, and then steeping in water mixed with protosulphate of iron.

White.

The leather obtained by tanning with ttree pods is a greyish-white.

To make skins white, rub them, after tanning, with a preparation of salt and alum.

Dye Plants mentioned in Recipes.

Native Name.				Botanical.
Garán	...	...	...	Cerriops Roxburghiana.
Bakul	...	...	...	Mimusops Elengi.
Jám	...	...	...	Eugenia jambolana.
Porashi	...	...	...	Thespesia populnea.
Asun	}	...	...	Terminalia tomentosa.
or				
Ashna	}	...	...	Terminalia, species unknown.
Gatheyas				
Deuch	}	...	...	Erythrina sp.
Madar				
Haritaki	...	...	...	Terminalia Chebula.
Sidha	...	...	...	Lagerstroemia parviflora.
Tiree pods	...	...	...	Cæsalpinia sp.

IMPROVED RELATIONS BETWEEN INDIA AND AUSTRALIA.

One important result of the Exhibition has already been shown in the increased number of visitors from India to these colonies. Army officers, members of the civil service, merchants, and other Anglo-Indians long resident in the east, find a periodical change of air and scene indispensable, but the sudden transition from the burning heat of India to the chilly, damp climate of England, often proves injurious, if not absolutely fatal to health. In Australia, however, they are offered special advantages, which few other countries can afford. No matter at what season of the year they arrive, a genial temperature may be found in one or other of the colonies, whilst they are among people of their own race, speaking the same tongue, and under British laws. Prior to the Exhibition, little or nothing was known of Australia, but, from the display then made, the Anglo-Indian community at once saw the wonderful progress made by the colonies both in respect to material and social development. They were not slow to recognise that in Australia a home could be made for themselves and their families, where education of a high class for the latter, and where all the advantages and refinements of an advanced civilization could be commanded. That this feeling will spread rapidly there can be little doubt, as every steamer from India now brings a fresh contingent of passengers, and nearly all of those whom we have met expressed themselves surprised and highly pleased with the colonies and with the people. The information disseminated on their return is certain to be the means of influencing others to undertake the journey, and a yearly increasing influx may therefore be anticipated. The want of a direct line of steamers has hitherto proved an obstacle to the development of both passenger and goods traffic, and advantage was taken, while in Calcutta, to give prominence to the matter, which was dealt with in the following letter by the Secretary to the Victorian Commission, published in the leading newspaper of that city:—

“SIR,

“The remarks of His Excellency the Viceroy at the opening ceremony of the Calcutta International Exhibition on the subject of Australian participation in the undertaking have been received with much satisfaction, and, so far as Victoria is concerned, the kindly sentiments expressed by His Excellency are fully appreciated. Several gentlemen from Victoria at present residing in Calcutta, who had the pleasure of attending the ceremony of Tuesday last, have since waited upon Mr. Bosisto, President of the Royal Commission for that colony, for the purpose of discussing the steps which should be taken to give practical effects to our representation at the Exhibition, by developing the trade between India and Australia, and, as the subject is just at present of special interest, the President has desired me to give a few of the points discussed. In the course of his speech the Marquis of Ripon said:—

"I understand also, and I rejoice very much at it, that the Australian portion of this Exhibition is extensive and full of interest. I also understand that we have present amongst us in this city a considerable number of gentlemen from the Australian Colonies, and that more are expected to follow in their wake, and I am sure that one and all here present will join with me in offering to them a hearty welcome. (Loud cheers.) It has been said in the report that the Lieutenant-Governor feels very strongly the possibility and the great importance of developing the trade between this country and Australia. In that opinion I heartily concur. I believe that there is a great future before the trade of India and Australia, and I have no doubt that, if this Exhibition furthers the development of that trade, that result alone will be amply sufficient to justify and reward the labours of those who have carried out this undertaking. (Cheers.)"

"At present the trade between India and Australia is small, a fact which is attributable, not to the want of commodities which could be advantageously exchanged, but rather to the absence of information respecting the mutual wants of those two great countries and their products and resources. The present Exhibition will doubtless go far to extend a knowledge of Australia and its people in India, and the gentlemen who have come so far to assist in the undertaking will, on the other hand, carry back with them much information of a valuable and interesting kind. An impetus will, we all hope, be given to commerce, and, judging from the results derived from the late Melbourne Exhibition, there is excellent ground for believing that the anticipations of the Viceroy will be fully realized.

"Without here specifying all the products of India which can find a ready market in Australia, some of the more important lines may be mentioned, viz., jute, cotton, and other piece goods of native manufacture, carpets, rice, tea, and similar products. These would alone serve to build up an important and lucrative trade—in fact the foundation has already been laid—but energetic action is required to prosecute it further. With the exception, perhaps, of horses, Australia has hitherto supplied little or nothing to India—notwithstanding the immense variety and extent of her products, many of which are peculiarly adapted to the requirements of this country. One cause of the non-development of the Indo-Australian trade is undoubtedly the want of direct steam communication, and, until this is secured, it will be useless to expect any important results to follow the Exhibition. At present the only regular means of communication between Australia and India is that afforded by the mail steamships of the P. and O. Company, and anything more unsatisfactory it would be difficult to imagine. Bearing in mind the growing competition between rival steamship companies all over the world, it is astonishing to find how little attention has been paid to the trade between the colonies and India. At present it is impossible to reach Calcutta from Melbourne under 40 days, unless a detour by way of Bombay is made, in which case the expense and inconvenience of a railway journey of nearly 1,400 miles must be undertaken. It seems almost incredible that while only twenty days should be occupied in steaming from Melbourne to Colombo, that another twenty should be required to perform the short remaining distance between the latter place and this city. The detention of passengers at Colombo for twelve or thirteen days is in itself a serious bar to improved relations between the two countries, but a far more serious obstacle to trade is offered by the transshipment and rough handling to which goods proceeding to either place are subjected. Some idea may be formed of the difficulties at present encountered by shippers desirous of opening up trade, when it is stated that goods from Australia are handled no less than six different times. First of all, there is the shipment on board at Melbourne. Then, on arrival at Colombo, the goods are taken out of the vessel and placed in lighters; from thence they are carried on the heads of coolies to the godowns of the company. They are handled a fourth time when removed into other lighters for the steamer appointed to convey them to Calcutta. The fifth handling takes place from the lighters to the steamer, and on landing at Calcutta they are again handled. These frequent handlings are bad enough, but even here the troubles of shippers do not end. It sometimes happens that the connecting steamer is too full to take up the Australian cargo, and, as was actually the case with many of the exhibits despatched from the colonies, prolonged detentions take place. In one instance a valuable and important exhibit was detained for no less a period than six weeks, and some others have not yet come to hand at all. As the work of transshipment at Colombo naturally devolves on coolies, the goods receive much rough treatment, and, where they are at all fragile, it is almost impossible to land anything in Calcutta in a sound condition.

"In the future there will no doubt be a good trade between these countries, which form a part of the same great Empire, but, until the difficulties of which I have given a faint outline, are surmounted, a speedy realization of the kindly expressed sentiments of His Excellency the Viceroy will be impossible."

Since that letter was written, however, the enterprise of several Melbourne merchants has been manifested in the purchase of a large and powerful steamship, which it is intended to devote to the Indo-Australian trade, performing regular journeys between the principal ports of the colonies and Madras and Calcutta. As she has been specially built for the purpose, and will have passenger accommodation, a powerful stimulus will be offered to the opening up of trade, as the difficulties enumerated in the Secretary's letters will be swept away.

Several of the principal exhibitors in the Victorian Court are so well satisfied with the results of their participation, that the suggestion to establish an agency or trading company for the purpose of supplying Australian products in Calcutta and Madras has met with their warm support. The Exhibition has done good service in directing attention to many products of the colonies which could find a market in India, but the difficulty experienced by the people in Calcutta and other centres of population is how to obtain them. Many would-be consumers inquired anxiously where they could obtain a regular supply of wines, biscuits, preserves, and other food productions, and similar interest was manifested by tradesmen in such articles as tweeds, hides, leather, timber, &c. What is now required is a centrally situated depôt, where purchasers could have their wants supplied, in large or small quantities, on the assurance that the articles were of the best quality. In dealing, however, with any agency of the kind, especial care would have to be taken that every article was of the very best quality, as India is like no other country in the world as regards climate, and the failure that has attended one or two previous attempts to open up trade there has been attributable in a measure to the want of knowledge of the seasons, and the exact requirements of the people. It is probable that practical measures will shortly be taken in the direction indicated.

EXCHANGES WITH THE INDIAN GOVERNMENT.

Following out the custom adopted in connexion with other Exhibitions, the collections contributed by the various Government departments of Victoria were presented at the close of the Exhibition to the Indian Government for distribution amongst the Imperial museums, educational institutions, and other public bodies. These collections were supplemented by a series of handsome photographic views of streets and buildings, gardens, &c., presented by the Melbourne, Ballarat, and Richmond City Councils; also by collections of grain, seeds, &c., contributed by the National, West Bourke, Murray Valley, Wimmera, and other agricultural societies, and also by Mr. George Smith, of Ballarat, and several other private exhibitors. For all of these suitable exchanges were promised, and already several collections of plants and seeds, books and other publications, obtained from the Indian Government for presentation to various public institutions in Victoria, have arrived, and it is understood that no time will be lost by the officers of the Indian Government in completing and forwarding other collections for this colony. An extensive collection of grain and fodder seeds, fibre plants, &c., by the Agricultural Society of India, intended as exchanges for samples of cereals, &c., presented to that body from the Victorian Court, has been distributed to the National Agricultural, the Victorian Horticultural, and other societies. Wardian cases, containing rare Indian plants, were also obtained from Dr. George King, of the Royal Botanic Gardens, Seebporc, Calcutta; and these have been distributed to the botanic gardens of Melbourne, Ballarat, Geelong, Sandhurst, and Castlemaine, together with collections of Indian seeds of all kinds. Appended to this Report is a list of seeds, &c., distributed. The work entailed by the distribution has been heavy, and as it was

necessary that no time should be lost in order that full advantage might be taken of the present sowing season, the preparation of this Report has been a little delayed in consequence.

During the absence of the Secretary in India, the duties of his position were filled by Mr. Joseph Knowles, who has throughout proved himself a zealous and efficient officer.

In conclusion, we desire to place on record our thanks to all the members and officers of the Indian Government, and the Government of Bengal, with whom we were brought into contact—particularly to the Honorable Colonel S. T. Trevor, R.E., who, in his capacity of Vice-President of the Executive Committee appointed by the Government of Bengal, invariably extended to us the utmost courtesy and attention; to Mr. E. C. Buck, Secretary to the Government of India; to Dr. George King, of the Calcutta Botanic Gardens; to Dr. George Watt, of the Educational Department of Bengal; to Mr. W. Girling, of the Public Works Department; to Mr. R. D. Mehta, of "The Empress" Cotton Mills; to Mr. Hem Chunder Kerr, of the Bengal Judicial Department; to the Members of the Calcutta Press; and to Mr. W. Duff Bruce, Vice-Chairman of the Calcutta Port Commissioners—for many acts of kindness during our stay in India.

Mr. George Aviett, who acted as foreman of the Victorian Court, was entrusted with the execution of important duties, which he discharged in the most satisfactory manner.

We have the honour to be, gentlemen,

Your obedient servants,

JOSEPH BOSISTO, President.

JAMES THOMSON, Secretary.

APPENDIX A.

AWARDS TO VICTORIAN EXHIBITORS AT THE CALCUTTA INTERNATIONAL EXHIBITION, 1883-4.

Exhibitor's Name and Address.	Description of Exhibit.
<i>Certificate of Merit of the First Class, with Gold Medal.</i>	
E. Rowlands, Melbourne and Ballarat ...	Cordials and syrups
E. Rowlands, Melbourne and Ballarat ...	Aerated waters
Mrs. J. E. Lawrence, Victoria ...	Picture of Queen Victoria in needlework
Miss Annie Smith, School of Art, needlework, Melbourne	Screen, threefold, silk embroidered, designed on satin, and mounted in ebonized frame
Alcock and Co., Russell-street, Melbourne ...	Billiard table and accessories, including electric marking arrangements
Department of Education, Melbourne ...	Models of State schools, books, maps, &c.
Felton, Grimwade, and Co., Melbourne ...	Kruse's fluid magnesia
Felton, Grimwade, and Co., Melbourne ...	Collection of essences
Felton, Grimwade, and Co., Melbourne ...	Thomson's essence of rennet
Swallow and Ariell, Melbourne ...	Collection of biscuits
Swallow and Ariell, Melbourne ...	Collection of cakes
Michaelis, Hallenstein, and Co., Melbourne ...	Exhibit of sole leather
Johnston and Co., Melbourne ...	Rock-boring machine
J. W. Lindt, Melbourne ...	Photographic portraits and views of scenery, &c
Sir W. J. Clarke, Sunbury ...	Fleeces of Leicester sheep wool
Lieutenant-Colonel Buchanan, Lismore ...	Fleeces merino lamb's wool
Hon. Philip Russell, Carngham ...	Fleeces merino lamb's wool
J. Bosisto, M.P., Melbourne ...	Collective exhibit of chemical and pharmaceutical preparations obtained from the eucalyptus tree, and from other sources
J. Bosisto, M.P., Melbourne ...	Eucalyptus liqueur
Department of Agriculture, Melbourne ...	Collection of wheat, oats, barley, rye, maize, pease, millet, &c.
John Ferres, Government Printer, Melbourne...	Collective exhibit of printing and bookbinding
Baron von Mueller, K.C.M.G., Government Botanist, Melbourne	Collection of Australian flowers not yet introduced into horticulture, preserved in an album
Henry Cain, Melbourne ...	Pure malt vinegar
Australian Freehold Land and Produce Company Limited, Melbourne	Wines, red and white
Braché and Co., Melbourne ...	Wines, red and white
A. Bruhn, Sandhurst ...	Wines, red and white
Caldwell and Co., Melbourne ...	Wines, red and white
A. and R. Caughey, Melbourne ...	Wines, red and white
J. Cosmo Newbery, C.M.G., Superintendent Industrial and Technological Museum, Victoria	Specimens of indigenous timber
Baron von Mueller, K.C.M.G., Government Botanist, Melbourne	Specimens of Australian woods
Thomas Aitken, Melbourne ...	Spirits of wine in cask
John Davies, Melbourne ...	Wine, red and white
De Castella and Rowan, Melbourne...	Wines, red and white
Frederick Grosse, Melbourne ...	Wines, red and white
G. F. Morris and Sons, Brown's Plains ...	Wines, red and white
G. S. Smith, Wahgunyah ...	Wines, red and white
Victorian Champagne Company (Limited), Melbourne	Champagne { Crème de Bouzy } From Victorian grapes
Heidelberg Cheese and Condensed Milk Company Limited	Condensed milk { Perle d'Australie }

AWARDS TO VICTORIAN EXHIBITORS, ETC.—*continued.*

Exhibitor's Name and Address.	Description of Exhibit.
<i>Certificate of Merit of the First Class, with Silver Medal.</i>	
Thomas Aitken, Melbourne	Ale and porter
Findlay and Son, Richmond, Melbourne ...	Invalid's ale
Hop Bitters Manufacturing Company, Melbourne	Hop bitters
John Currie, Melbourne	Cheese, specially manufactured and packed for the Indian market
National Museum of Victoria	Natural history collection
W. C. Pierce and Son, Sandhurst	Pickles (various kinds)
Red Cross Preserving Company, South Yarra, Melbourne	Pickles (various kinds)
H. H. Hayter, Esq., Government Statist, Melbourne	Victorian statistical books
Jas. Curtis, Ballarat	Specimens of letterpress printing
Troedel and Co., Melbourne	Specimens of lithographic and general printing
Pausacker, Evans, and Co., Melbourne ..	Portmanteaus and trunks
John Curtis, Melbourne	Portmanteaus and trunks
George Cannack, Castlemaine	Collective exhibit of leather
Victorian Woollen and Cloth Manufacturing Company, Geelong	Tweeds, cloth, and flannel
Rocke, Tompsitt, and Co., Melbourne ...	Silk elastic surgical goods
Swallow and Ariell, Melbourne	Flour from Victorian wheat
S. Danelli, Melbourne	Macaroni, &c. (Victorian)
W. Horwood, Castlemaine	Bells, 24in. and 18in. in diameter
Watson and Patterson, Melbourne	Hams and bacon
Ed. Zorn, Oakleigh, Victoria	Tomato sauces
Mrs. Thos. Coker, Ascot Vale, Melbourne ...	Pickled grapes
J. C. Hutton, Melbourne	Hams and bacon
Mrs. E. Rowan, Melbourne	Twelve water-colour drawings of Australian and New Zealand native flowers, berries, &c.
Douglas and Sons, Melbourne	Two 5-light gasaliers and gas-brackets complete
Department of Agriculture, Melbourne ...	Samples of wool
J. McEwan and Co., Melbourne	Garden fountain
Flemington Meat-preserving Company, Melbourne	Collective exhibit of preserved meats
Flemington Meat-preserving Company, Melbourne	Bonilli and ox-tail soup
Western Meat-preserving Company Limited, Colac	Kangaroo-tail soup, hare soup, and mulligatawny soup
Sands and McDougall, Melbourne	Chromo-lithographs of Victorian Art Union presentation pictures
David Syme and Co., Melbourne	Collective exhibit of wood engravings and lithographs
N. J. Caire, Melbourne	Views of Botanic Garden, Melbourne
R. L. J. Ellery, Melbourne	Photographs of the moon
Department of Mines and Water Supply, Melbourne	Maps of Victoria, Australia, and geological maps
Department of Lands, Melbourne	Maps of Australia, Victoria, Melbourne
W. C. Pierce and Son, Sandhurst	Sauces (colonial)
Lewis and Whitty, Melbourne	Curry powder (colonial)
Lewis and Whitty, Melbourne	Starch, blue, blacking, and polish
Felton, Grimwade, and Co., Melbourne ...	Carbolic and fuller's earth soap
Trouette and Blampied, Great Western ...	Vinegar
G. M. Whittall and Co., Melbourne... ..	Wool mats, plain and fancy
John Eadie, Sunbury	Wine, red and white
E. Graham Fulton and Co., Melbourne ...	Wine, red and white
J. Stewart Johnston, Sunbury	Wine, red and white
Joachim Kahland, Sandhurst	Wine, red and white
R. Kurle, Sunbury	Wine, red and white
A. Mueller, M.D., Yackandandah	Wine, red and white
Department of Agriculture, Victoria ...	Seeds of various kinds
W. R. Guilfoyle, F.R.S., Director Botanical Gardens, Melbourne	Ferns and todeas in cases and tubs
E. T. McGeorge, St. James' Park, Hawthorn...	Drill test, or borehole indicator, for the survey of bores which have deviated from their intended direction
E. McLean and Sons, Bridgewater, Loddon ...	Cordials and liqueurs

AWARDS TO VICTORIAN EXHIBITORS, ETC.—*continued.*

Exhibitor's Name and Address.	Description of Exhibit.
<i>Certificate of Merit of the First Class, with Silver Medal—continued.</i>	
Miss Elizabeth Fuller, Inverleigh ...	Flowers formed with Australian birds' feathers
Peter McIntyre, Mameluke, Beaufort ...	Washed merino wool
Melbourne Milk Supply Company ...	Cheese
A. A. Harris, Clunes ...	Preserves
Carl Pohl ...	Wines, red and white
W. Hughes ...	Wines, red and white
Lewis Loan, Walhalla ...	Aerated waters
Montague Brown, South Yarra ...	Tomato sauce
W. P. Brown, Melbourne ...	Tomato sauce
<i>Certificate of Merit of the Second Class, with Bronze Medal.</i>	
Lewis Loan, Walhalla, Gippsland ...	Light ale
S. Greene and Co., Melbourne ...	Cordials and syrups
W. H. Newlands, Castlemaine ...	Specimens of printing
Melbourne Milk Supply Company Limited ...	Condensed milk
Reformatory, Ballarat, J. Evans, Superintendent	Jackets, trousers, and vests as worn by boys in the Reformatory
Dillon, Burrows, and Co. ...	Confectionery
Edwards and Kaul, Melbourne ...	Emu eggs mounted in silver
Stokes and Martin, Melbourne ...	Coins and medals
Stokes and Martin, Melbourne ...	Emu eggs mounted in silver
Penal Establishment, Pentridge ...	Serge frock, serge trousers, blue cloth trousers, flannel shirts
T. W. Purdue, Ballarat ...	Collective exhibit of harness
D. Altson and Co., Melbourne ...	Collective exhibit of harness
Max Pincus, Castlemaine ...	Perfumery (florozone, &c.)
Miss H. D'Alton, Stawell ...	Paintings in water colours of Australian wild flowers
J. Mather, Melbourne ...	Two oil paintings—landscapes
A. A. Harris, Clunes ...	Tomato sauces (Victorian)
W. H. Bullivant, Longerenong ...	Pure merino wool
W. Lewis, Hoveleigh ...	Ram, wether, and lamb fleeces of wool
J. Zevenboom and Son, Melbourne ...	Brushware of every description (collective exhibit)
T. A. Oldmeadow and Son, Dunolly ...	Collective exhibit of fruit and tomatoes
Department of Trade and Customs, Melbourne...	Photographs of docks, &c.
Melbourne City Corporation ...	Views in Melbourne
Bendigo Pottery Company, Sandhurst ...	Majolica, stoneware, and whiteware
L. Nolan, Brunswick ...	Terra cotta jars, stoneware, &c.
Troedel and Co., Melbourne ...	Framed chromo-lithographs
Red Cross Preserving Company, Melbourne ...	Sauces (Victorian)
Felton, Grimwade, and Co., Melbourne ...	Collection of drugs and medicines
Jno. Danks, Melbourne ...	Engine brasses and other fittings
W. Upton and Sons, Geelong ...	Ordinary and eucalyptus soaps
J. Jopling, Ballarat ...	Neatsfoot oil
E. Rowlands, Melbourne ...	Collective exhibit of liqueurs
J. Sullivan, Melbourne ...	Disinfectant powder
Wimmera District Agricultural and Pastoral Society, Dimboola	Wheat
W. Corrie, Melbourne ...	Curled hair and flocks
Continuous Brake Company, Melbourne ...	Continuous hydraulic railway brake
Joseph Best, Great Western ...	Wines, red and white
G. Breusing, Goulburn River ...	Wines, red and white
A. W. Fox, Bendigo ...	Wines, red and white
Jno. Gemmill, Beechworth ...	Wines, red and white
Baptista Gianetti, Bealiba ...	Wines, red and white
Graham Bros., Rutherglen ...	Wines, red and white
R. Jack, Rutherglen ...	Wines, red and white
L. Kitz and Son, Melbourne ...	Wines, red and white
D. Logan, Rutherglen ...	Wines, red and white
C. Réau, Wahgunyah ...	Wines, red and white
G. F. Morris, Brown's Plains ...	Wines, red and white
R. Trimble, Rutherglen ...	Wines, red and white
Trouette and Blampied, Great Western ...	Wines, red and white
Mons. L. Moonen, Melbourne ...	Musical instruction books
E. and J. Spink, Melbourne ...	Jams

AWARDS TO VICTORIAN EXHIBITORS, ETC.—continued.

Exhibitor's Name and Address.	Description of Exhibit.
<i>Certificate of Merit of the Second Class, with Bronze Medal—continued.</i>	
G. S. Smith	Brandy
Clifton Mineral Springs Company, Drysdale ...	Mineral waters
Secretary Royal Commission for Victoria ...	Special certificate for Catalogue of Victorian Court

Certificate of Merit of the Third Class.

McLean Bros. and Rigg, Melbourne ...	Iron-framed chairs for public halls and theatres
Shire of Metcalfe, Victoria ...	Polished column of granite from the Harcourt quarries
Melbourne Milk Supply Company Limited ...	Butter in tins
Melbourne Brewing and Malting Company ...	Ale and porter
Kitz and Son, Melbourne ...	Cider
Jno. Danks, Melbourne ...	Suet lubricators, drop-light lubricators, steam whistle, organ whistle, set Bailey gauge mounting, set of petcocks, &c.
J. Noone, Crown Lands Office, Melbourne ...	Photo-lithographic copies of plans
T. Aitken, Melbourne ...	Rum in cask
Jno. Curtain, Melbourne ...	Brandy from Victorian wine
Australian Company Limited, Melbourne ...	Models of lithofracteur and dynamite cartridges, &c.
T. Kerr, Ballarat ...	Collective exhibit of saddles
F. Flood, Melbourne ...	Improved water-lift
Ballarat City Council ...	Views in Ballarat
J. H. Knipe, Melbourne ...	Views of the Melbourne Exhibition
Board for Protection of Aborigines ..	Basket-work
Education Department, Melbourne ...	Drawings in water-colour of State schools
R. Cockerell, Melbourne ...	Collective exhibit, patent cross cultivator and pulveriser
Baron von Mueller, K.C.M.G., Government Botanist, Melbourne	Victorian silk and cocoons, prepared by Mrs. Timbrell
Melbourne Brewing and Malting Company, Melbourne	Hops (Victorian)
J. Henty and Co., Melbourne ...	Hops from the Coranderrk Aboriginal Station
New Zealand Loan and Mercantile Agency Company Limited, Melbourne ...	Wheat for export
W. H. Carwardine, Sandhurst ...	Domestic soap
S. Burston and Co. Melbourne ...	Barley, for malting
H. Best, Great Western ...	Wines, red and white
C. Buchanan, Ondit ...	Wines, red and white
T. Craike, Sandhurst ...	Wines, red and white
Fitzgerald and Newman, Castlemaine ...	Wines, red and white
J. and C. Smith and Co., Barnawartha ...	Wines, red and white
A. Trinkans, Muckleford ...	Wines, red and white
A. Calhoun, Portarlington ...	Wattle seed
Board for Protection of the Aborigines, Victoria	Complete collection of weapons used by the Victorian natives.
Wilson and Mackinnon, Melbourne ...	Engravings from the <i>Australasian Sketcher</i> .
Ballarat School of Mines ...	Collection of geological specimens of minerals
School of Mines, Ballarat ...	Collection of Minerals, &c.
Melbourne Brewing and Malting Company ...	Hops grown in Victoria

Certificate of Merit of the Fourth Class.

E. J. and S. Spink ...	Jams from Victorian fruits
Thomas Hopper, Carngham ...	Milk punch liqueur
S. Greene and Co., Melbourne ...	Aerated waters
A. Polson, Moyston ...	Wheat and oats of two kinds
Geo. Smith, Ballarat ...	Pease, wheat, &c. (collective exhibit)
L. Stevenson and Sons, Melbourne ...	Hats (various kinds)
Penal Establishment, Pentridge ...	Boots and shoes
Ballarat Carriage Company, Ballarat ...	Single buggy, with movable top
Ernest Giles, F.R.G.S., Melbourne ...	Pleasure buggy, manufactured for exhibitor by Stevenson and Elliott
T. Aitken, Melbourne ...	Spirits, in cask
Scotch Distillery Company, Sandridge ...	Whisky

APPENDIX B.

"AUSTRALIA AS IT IS."

[Reprinted from the *Statesman and Friend of India* of January 25th, 1884.]

There was a numerously attended meeting at the Dalhousie Institute yesterday afternoon, to hear the lecture delivered by Mr. Joseph Bosisto, M.P. for Victoria, on "Australia as it is," notwithstanding the considerable attendance at the Town Hall to commemorate the life of the great Brahma leader. The chair was taken by Mr. J. J. J. Keswick, President of the Bengal Chamber of Commerce, and there were with him on the platform M. Joubert, Honorable John Woods, M.P. for Victoria, Mr. Fouraces, Principal of the Seebpore Engineering College, Lieutenant-Colonel Cologan, Superintendent of Juries at the Exhibition, Major Just, Commissioner for Tasmania, Mr. H. J. Scott, Commissioner for South Australia, Mr. Stuart, Mr. F. A. Franklin, Commissioner for New South Wales, and Mr. J. Thomson, Secretary to the Victorian Commission.

Mr. Bosisto, who upon rising was warmly applauded, in clear and distinct tones delivered the following speech:—

"Mr. Chairman, Ladies, and Gentlemen—When the Government of India invited Australia to take part in the present Calcutta International Exhibition, most of the Governments of that continent responded to the invitation. Doubtless all of them would have complied had sufficient time elapsed between the date of the invitation and that of the opening day; however, Australia is well represented by four Courts, consisting of New South Wales, Victoria, South Australia, and Tasmania.

"The Commissioners of the colonies now in India have been repeatedly asked questions bearing upon Australia, and from the character of the questions put have been impressed with the vague and undefined notions existing relating to her territory, resources, and capabilities, as well as to her people, their industries, their mode and manner of life, their institutions, and their pleasures.

"I have therefore undertaken, upon the hint given in one of your daily journals (the *Statesman*), the task as best I can in a lecture to present to you—Mr. Chairman, ladies, and gentlemen, and I hope, through the Press, to the teeming population which here surrounds us—a view of *Australia as it is*.

"The country I am going to speak to you about is a very extensive one, and in order that you shall have the opportunity of following me in my remarks and illustrations, I have here on the wall a large map of Australia, and other maps which give the defined boundaries of each of the several colonies forming the great continent of Australia and the adjacent island of Tasmania.

"Up to the end of the sixteenth century, it was held by the philosophers of those times that a great south land existed somewhere in the distant part of the Southern Hemisphere. Nothing definite was known until, during the early part of the seventeenth century, an adventurous Dutch navigator scudded past some high land in the Southern Ocean, which he named New Holland; but until that noble and revered mariner, Captain Cook, undertook a thorough exploration of those seas, towards the third quarter of the seventeenth century, Australia, as New Holland was afterwards called, remained *terra incognita*, but through Captain Cook's representations to the British Government, the first Australian settlement was founded at Sydney in 1788. For the next ten years nothing was done towards exploring the shores of Australia. Ultimately the coast was examined by other navigators sent out under the British flag; and the southern shores especially received their attention. The early settlers of New South Wales and Tasmania also took part in exploring the interior. In almost every instance the reports they made as to the appearance of the country visited were adverse to settlement. This evidently arose from various causes; the navigator looked for harbours and coves, and in their hurried examination found but few; even Captain Cook omitted to find the beautiful harbour of Sydney—he having missed its entrance and ran into Botany Bay, which was only three or four miles distant.

"The early settlers looked for pastoral lands, and knowing nothing about the seasons of the year, or the liability of the country to drought, traversed it during the hot summer months, and from its dry and parched appearance concluded it to be unfit for their purpose.

"The prevailing idea in those days relating to settlement had reference chiefly to sheep or cattle farming, and as the district of Sydney had been taken up for the purpose, say within a circumference of 100 miles, those who arrived later on had to push into the interior. Fine pastoral land was afterwards found, and better seasons were experienced, and the settler obtaining his 'licence to occupy Crown lands for pastoral purposes'—the area licensed often covering 300 square miles—was afterwards known as a 'run,' and himself as a 'squatter,' his head-quarters being styled a 'station.' This process of occupying lands commenced and went on from the time Great Britain took possession of the country until the vast extent of territory then known was fairly covered with squatting stations; but as time went on, people came for trading purposes and for

other callings, chiefly from England, Ireland, and Scotland; hence there gradually arose throughout Australian cities, towns, villages, and large agricultural districts. The labours of these people soon presented utilitarian products and educts of the soil adapted to man's practical wants; slowly at first, nay even for many years, this process of colonization went on, and the squatter gradually pushed more and more into the distant interior, until now, where formerly they could be counted by hundreds, comparatively few remain in their primitive condition.

"The whole of Australia at first was under one Government, located in Sydney, and receiving from Downing-street—the chief centre of the British Government—instructions how to act. By degrees population increased over its vast area; the country was divided into colonies, or, as it is more appropriately termed here, presidencies. At present there are five colonies, each one presided over by a governor appointed by Her Majesty the Queen; each one having its own independent Parliament. Tasmania, an island close by the main land, forms another Government, precisely on the same basis, and is accepted as part of Australia, making the sixth colony.

"The area of the Australian continent is estimated to be something over three millions of square miles, the northern portion being within the Tropic of Capricorn, but the greater portion lying under a sub-tropical sun. Australia has had many explorers, men of hardihood and sufferers of privations, who, in the distant and latter past, have run their lines of travel through the length and breadth of the land; it may, therefore, be said that but little of the territory remains unknown. The highest mountain is less than 10,000 feet high, and few exceed 6,500 feet in height. Majestic Alpine chains stretch through many parts of Victoria and New South Wales, giving a snow line region where it never entirely melts.

"This may appear strange to people who view their mountain snows at such a high altitude, as in the Himalayas. I can only suggest a cause, viz., that the cold antarctic winds receive their first break on these bleak mountain ranges, thereby reducing the line of snow. Ranges less in height extend for hundreds of miles over many parts of the country, running chiefly east and west. Ravines and valleys abound in all the hilly countries, rich in a strange but beautiful growth of vegetation—from the forest tree to shrubs, flowers, ferns, creepers, lichens, and mosses. Undulating lands, moderately timbered and well grassed, abound. Plains of good herbage, of rich loamy soil, as well as plains of less pretensions, cover large areas. Over these the sheep flocks and herds of cattle ruminant, belonging either to a squatter or settler; and yet again there are plains and hilly countries producing only stunted timber, together with a sparse undergrowth, and also other lands representing desert wastes. Salt and fresh water lakes cover extensive areas, occupying in some instances 60,000 acres. Some of these lakes are extinct volcanoes, and have no visible outlet. Rivers are not abundant, the largest being the river Murray, having a length of 1,300 miles. Naturally, the contour of Australia varies considerably. In some parts there is an abundant water supply by means of the rivers and fine flowing creeks, but taken as a whole it is not well supplied at present, but means are now being taken to give a plentiful supply by means of canals and other irrigation works.

"The natural water supply of Australia has some peculiar features; for instance, a river may have a deep and rapid flow during eight months in the year, running through a country for 250 to 400 miles, terminating in a lake or over a plain, and become traceable no further. Again, on some plains salt water can be obtained at a depth of from 30 to 80 feet. Passing down deeper to a depth of 200 to 250 feet, fresh water appears and will rise some few feet, and yet over the country I am now describing, which is some millions of acres in extent, no rain may have occurred for many months. A tree shrub is met with which, if uprooted, and the root cut and placed in a vessel, a good draught of clear and sweet water can be obtained. Again, along the coast of Australia, fresh water can be obtained by sinking in the sand just above high-water mark at any time. Artesian wells here and there are met with, and, during the alluvial diggings in the gold-fields, several old beds of rivers were reached at a depth of one to two hundred feet.

"The rainfall of Australia may be given approximately as follows:—In the hill districts, 50 inches per annum; undulating woodland districts, 30 to 50; plains adjoining, 20 inches; over wide expansive plains away from mountains or hills, from 5 to 15 inches. In the far interior, rain is very scarce; it has been known to have been entirely absent two or three years together, and yet nature supplies there a bush termed salt-bush, which in times of excessive drought will feed and support sheep for a long time without water.

"I now come to speak of the climate of Australia. It would be invidious on my part in a lecture on Australia to particularize any one of her colonies as being healthier than another. Indeed, were I so inclined, I should fail in the attempt to speak on the subject of climate over an extended space such as the continent of Australia is, and cannot be stated in a few sentences. Aerial, oceanic, and terrestrial magnetic currents produce many forces and changes, especially over our desert tracts, which only a few meridians separate from regions of snow; these alone are sufficient to vary climate, yet we have preponderating evidence that other causes exist to make the climate of Australia pleasantly habitable for man. It is true that the northern portion of Australia pertains greatly to the climate around Calcutta; the moisture in the air, the heavy tropical rains, the sandy nature of the soil, the high temperature during many months of the year, and the mangrove swamps which skirt its coast, mar the enjoyment of life. Still the boundary of such country is very small in comparison to the rest of Australia.

"There is nothing in the physical features of Australia to promote miasma. Its lagoons and swamps are not extensive, most of them dry up during the summer months, and even where they remain otherwise, there are surroundings of a healthy character which obviate any ill-effect; its virgin soil, the absence of any settled population until these latter days, together with a special vegetation, has given it a pure atmosphere, and only when population now transgresses the laws of

sanitation do fevers abound. In the days of rapid colonization some thirty years ago, when drainage and other sanitary regulations were absent, typhoid and other fevers hovered over the dense population of its cities and towns, but even then a great compensating law was ever present, known as the hot winds. These with their withering blasts would enter into every habitation, destroying or attenuating the germs of fever, relieving many, and restoring them speedily to a condition of health. At present the severe types of fever seldom take hold of the people; sanitary laws are but little broken, and the people suffer only from the ills of life, either the result of inheritance or from their own transgression of one or other of nature's laws.

"But there is another factor at work in Australia which makes the climate so acceptable to human life, and that is its vegetation; for however much we may laud the rarefied and bracing mountain air, or point out the temperate isothermal lines of Australia in many of its parts, corresponding with such districts in the Northern Hemisphere as Marseilles, Bordeaux, Bologna, Nice, Vienna, and Madrid, places well known where the Northern invalid is often sent to recover, if possible, the health lost through living in a severer clime, yet the fact must never be lost sight of, that the vegetation of a country plays an important part upon its climate and health. In Australia we have a vegetation peculiarly and emphatically its own; only in the adjacent islands, particularly Tasmania, is it shared in indigenously. It belongs to the natural order of the myrtle family, and forms a tribe of trees, the leading features of which are distinct from any others. They are known in Australia as gum trees, and to botanists as the eucalyptus; there are about 150 distinct species, which form four-fifths of the vegetation of the country. You cannot travel over any part of that continent without meeting with the eucalyptus; they grow and thrive everywhere—on the mountain slopes, on the undulating lands, on hills and down dales, by the side of rivers and creeks; in many instances they form gigantic forest trees, rising in elevation to 300 and 400 feet high without a branch, but in most cases assuming fair tree proportions. It is from these that most of our timber is obtained. Even over the arid country, millions of acres are covered with the dwarf species of the eucalyptus; they are all evergreens, casting their bark only, and that annually. Most of the leaves of the different species are full of oil cells, visible to the naked eye. The leaves have stomata, or breathing pores on each side, and the petiole, or leaf-stalk, performs an interesting action by turning one side or the other constantly to the direct rays of the sun. When these are obstructed by clouds or by night, then they turn to the warm currents of air existing. Under this operation a continued leaf action of absorption and exhalation is going on. The leaves of these trees are very abundant; and in every one hundred pounds of leaves in the chief species 60 ounces, or three imperial pints, of a pure volatile oil is obtained; other kinds are less in quantity, but the average may be given at 20 ounces. Now, by the upward forces of each tree and the leaf action in the air, there is daily giving off an enormous amount of this volatile vapour throughout a large portion of Australia. The forests of Australia are full of this aromatising odour, and it is felt by every one travelling in the bush. The chemical effect of all this is, that there is set up a continued supply of peroxide of hydrogen, or, in other words, ozone, and climatically supply a healthy and vigorous atmosphere. Taking these things into consideration, it is not difficult to form the belief that Australia as a whole is the finest climate in the world.

"I come now to the natural resources of Australia—and first of all will speak of our timber. Although the leading forest timbers of Australia consist of the eucalyptus, yet there are a variety of other kinds. In the eucalyptus the wood varies in character quite as much as do other kinds obtainable from other timber trees; for instance, the well-known blue gum (*Eu. globulus*) is a hard light-coloured timber of great strength and tenacity, as well as durability; extensively used for beams and joists in buildings and for railway sleepers, also piers and bridges—a test of which has been made between some blue gum, English oak, and Indian teak. The blue gum carried 14lb. weight more than the oak, and 17½lb. more than the teak per square inch again.

"The red gum tree (*Eu. rostrata*) is a very hard compact wood, possessing a handsome curled but short grain, red in colour, well adapted for many purposes in ship-building, such as heavy framing, beams and knees; it is also used in the construction of culverts, bridges, and wharfs, and by wheelwrights for the felloes of heavy wheels, and is employed in Australia for railway sleepers and engine buffers; and owing to an acid it contains, termed 'Eucalyptic acid,' it resists the attack of the *Teredo Navalis*, or sea-worm. The iron bark gum tree is one of the hardest and heaviest of our native woods.

"The stringy bark tree (*Eu. obliqua*) is an easy splitting wood, and is usually employed for palings, shingles, and posts; in like manner do all the varieties change. Other descriptions of our other timbers may be mentioned—the huon pine of Tasmania, the blackwood, an acacia, the native sassafras, both of Tasmania and Victoria, the cedar of New South Wales. Many varieties of tree acacias are met with in all the forests of Australia, such as the myall and the wattles, also pines, banksias, casuarinas, pittosporums, eugenias, melaleucas, and others too numerous to mention. I would ask a visit to the several Australian courts; it would suffice to show that Australia possesses timber resources of no mean order.

"*Gold.*—In 1851 a new era dawned upon Australia, more especially upon Victoria. It was its year of separation from the parent colony of New South Wales, and it was the year in which gold was first found. Gold was found somewhat after this fashion. A shepherd minding his flock one day by the side of a creek of running water amidst the beautiful hills of a place in Victoria called Mount Alexander, was attracted with the somewhat singular appearance of a water-worn stone, which he broke in two, and carelessly looking at the broken pieces he espied a little bright-looking speck; it suggested the possibility of its being gold—a supposition which turned out correct. The information he gave brought about a number of claimants for the honour of finding gold, and a few sought the Government for a reward. The real *Simon Pure* was the shepherd, who neither put

in a claim nor asked for reward. The first rush of people to the gold-fields was from the adjacent colonies. So great was the exodus that many villages and towns had scarce a man left, except the aged and decrepit. The women did not denur; they knew that their lords and masters had gone to a land thousands of miles away to obtain fortunes easily. Some fared well, others the reverse; many a poor man became the owner of lakhs of rupees in marvellously short spaces of time.

"Before these times, in every part of Australia business and daily life were conducted in a quiet jog-trot way, and one of the most astonishing, and at the same time gratifying, features was a sudden leap from a gigantic sheep-run into a national life, which will bear comparison with much older communities. It is this industry which, within the limits of a generation, has, in Victoria alone, the smallest of the group, raised from the soil, the drifts, and the rocks, no less than two hundred and ten millions of pounds sterling worth of gold; or, in other words, has enriched the world with the distribution of the precious metal to the extent of fifty-five million ounces of gold.

"The news of the famous gold-fields of Victoria spread with electric rapidity over Great Britain, America, and the continent of Europe, and many of the hardiest, the most enterprising, and self-reliant of these nations made their way to her gold-fields.

"Thirty years ago it was a rare thing to see either old men or women at the busy mining centres. So great were the individual gain, and so secure was labour of all kinds, that prices were forced up enormously, and even long after the first wave of excitement had passed away, common necessaries, except meat, realised such prices as 1,200 rupees per ton for flour, and one and a half rupee for a pound weight of salt; but notwithstanding all these drawbacks to the development of mining—from an exciting and even exasperating scramble into the settled and well regulated industry it now is. The enterprise was steadily adhered to, and men who had been fortunate enough to make money in a hole 8 feet square, and from 10 to 30 feet deep, immediately invested their gains in other ventures, with variations of success and failure, perhaps, unsurpassed in history. This was the rule, of course with notable exceptions; but the fact that there are nearly 40,000 miners still employed in Victoria alone, and that the mechanical appliances in use are valued at two millions of pounds sterling (and this without taking into account the cost of shafts and underground working), is of itself a sufficient proof that mining in Victoria from the first discovery has been steady and progressive. Beginning on the surface and with the rudest appliances, the gold was traced into shallow 'leads' of gravel drift, laid bare by the line of workings into the creeks, water-courses, and rivers; these again, in turn, were traced to larger 'leads' and greater depths, until at length, through hundreds of feet of basaltic rock, and subterranean rivers of water which he had to fight and conquer, the dauntless miner found himself in the very beds of gigantic rivers of a period so far back in the earth's history that any tangible idea we can form of them would be lost in immeasurable distance. Hundreds of miles of these 'leads' have been literally scooped out, leaving the old river courses as bare as they were before the water running down them had begun to deposit gravel.

"In one place in Ballarat city, where alluvial mining has achieved its most complete development, two layers of basaltic rock, as a rule overlie the gutters. These rocks are separated by a thick belt of clay, which in itself proves the great length of time which must have intervened between the volcanic eruptions which sent these molten rivers over the lowest levels. In most cases these rocks rest upon the ancient drifts, and these drifts contain the gold.

"When it is remembered that a yield of seven or eight rupees' worth of gold per cube yard of these drifts is considered a handsome *return* for all the expense of sinking, pumping, and driving, to say nothing of paying monthly calls for years, some idea may be formed of the vast and scientific character of the industry in Victoria.

"It is not six months ago since one mine, the Ararat Grand Junction, was raising nearly four and a quarter million gallons of water every 24 hours, out of their workings some 200 feet deep; and this is only given as an instance of what is being done in that direction all over the gold belt of the colony. It was not before these vast masses of 'washdirt' on the gravel drifts began to succumb to the indefatigable miner, that anything like particular attention was paid to quartz lodes. As in the case of the alluvial, these also were traced from the surface, at least in the first instance, till now they represent, in the case of a mine at Stawell, in Victoria—viz., the Magdala Quartz Mining Co.—the enormous depth of 3,200 feet, and they are still striving to obtain gold-bearing stone below even that.

"Prospecting, as we term it, or seeking for a quartz reef, has been going on in this mine for the past fifteen years without intermission, and the shareholders say will continue to go on until the company get a golden reef.

"This particular mine is alluded to for the purpose of showing with what pertinacity a proprietary, either 'limited' or 'no liability,' stick to a venture when they think they have good grounds, from the geological formation of the country, that their labour will eventuate in finding payable stone. Add to this the fact that so perfect are the appliances, even at the depth of 3,200 feet, that seven pennyweights of gold to the ton, with a reef four feet thick, would pay handsome dividends.

"There is up to the present time no case on record where gold has been obtained at a greater depth than about 1,500 feet; but in the hope of finding it at a much greater depth, thousands of pounds are now in course of expenditure in Victoria alone. So much indeed has the gold-mining industry advanced there, that the machinery now employed to crush the thousands of tons of quartz raised annually reduces it absolutely to pulp; and I am bound to add, made by her own sons of toil, in her own foundries, and pronounced by judges to be the most perfect in the world. This

opinion bears some ratification from the fact that the exports of mining machinery from Victoria amounted in 1881 (the latest return I have by me) to £122,464 sterling, some of which, I am proud to say, found its way to India.

"The next great gold-producing colony in the group is New South Wales, then Queensland, then Tasmania, and then South Australia. The total value of gold raised in Australia, since the commencement of gold-mining to the end of the year 1883, is estimated at 266 millions sterling; out of this, Victoria produced 212 millions sterling.

"Other mineral beds are found distributed over Australia. Copper mines, covering extensive areas, are met with in South Australia and New South Wales. The first indication of copper existing in large quantities was found in 1845, in South Australia, at a place called the Burra Burra. Up to the time of the finding of gold in Victoria, these mines sustained some thousands of miners, and the ore raised was so rich in the metal that often virgin copper was obtained. The famous mines of Wallaroo in that country now eclipse for quantity any other copper mines in the world. There are some very rich lodes of copper existing, and being worked, in New South Wales. A visit to both of these Courts will show the magnitude of this industry.

"Again, there are large tin mines existing in Tasmania, New South Wales, and Victoria. The present known area over which tin is to be found in New South Wales is 5,440,000 acres. It is also widely scattered over Tasmania, and fairly well over Victoria. The tin-bearing granites of Australia appear to belong to the same geological era as those of Cornwall. Extremely rich deposits of drift tin have been and are continually being found in the beds of ancient streams, at a depth of 60 to 80 feet below the surface; but it more frequently happens that the overlying soil is only a few feet in thickness. All the colonies of Australia are mineral producers, and every leading port is shipping either one or other or all of the following:—Gold, silver, lead, antimony, copper, iron, bismuth, lignite, and kaolin. Precious stones are occasionally found, such as diamonds (slightly yellow in colour), sapphires, and rubies.

"Coming now to the carboniferous strata, or coal beds of Australia, without which no country outside of the gold-fields can be said to possess the inherent power either of progress or of competition, Australia stands well to the front. Although the southernmost and more northern portions of Australia are scant in this material, yet in the easterly countries it abounds to an unlimited extent. The principal coal beds exist along the coast to the north and south of Sydney, and into Queensland. It is estimated that over 23,000 square miles cover the coal measures of New South Wales, and a very large area in Queensland. The supply is unlimited. These are the many natural resources of Australia. Hitherto I have addressed myself only to this part of my undertaking, viz., to describe 'Australia as it is'; we will now turn our attention to her *social, industrial, and commercial* resources.

"I have already intimated that there are six colonies in the Australian group; many of them have large territories, and in some parts are yet sparsely inhabited. Victoria is the smallest, but her population at present is the largest. Western Australia is the only Crown colony; each of the others have independent and free Constitutions. Having their own parliaments, each one discusses and deals with every question bearing upon its own internal policy, advancement, and social well-being. Each Parliament is conducted under the rules and regulations of the Parliament of England; elects its own Speaker, chairmen of committees, and every member possesses the same privileges relatively as a member of the House of Commons. Each colony has an Upper and Lower House. The Lower House is termed the Legislative Assembly. In Victoria, New South Wales, and South Australia the franchise is manhood suffrage, after a residence of twelve months in the colony—if a naturalized subject of Her Majesty. The system adopted for elections is that of vote by ballot. Municipalities exist throughout the country, and are conducted under town or shire councils elected by the people of the district. The whole country is under good rule and discipline. Benevolent institutions, hospitals, public libraries, scientific and literary institutions exist throughout Australia.

"The educational system of Victoria, which may be taken as an index of the whole Australian system, the basis of which is that secular instruction shall be provided by the State without payment for all children whose parents may be willing to accept it, but that, whether accepted or not, satisfactory evidence must be produced that all children are educated up to a given standard, has been most successful in its operation; and, for securing the object sought to be attained, it is believed compares favorably with any country in the world. In 1872, just before the present system came into operation, the number of children returned as attending school was 137,978, whilst in 1881, after the system had been in force for nine years, the number had increased to 229,588, or over 66 per cent., although during the same period the population of the colony had increased by only 15½ per cent. It was officially estimated by the Government Statist that in 1881 all the children in Victoria between the ages of six and fifteen (the school age), except about 3¼ per cent., were receiving education during some portion of the year. It has also been estimated that the children attending school for not less than 30 days in a quarter amounted to about 74 per cent. of the numbers on the rolls, a proportion of efficient school attendance which, it is believed, has been attained in but few countries.

"Nothing better exemplifies the rapid progress of Australia and her people than the newspaper press of Sydney, Melbourne, Adelaide, Brisbane, Hobart, and other cities. There is not a community in the world better supplied with high-class journals than the cities named, and many of the provincial newspapers are also creditable productions in the extreme. In Melbourne, Adelaide, and Sydney there are numerous daily newspapers, published both morning and evening, and two of them in size and arrangement closely rival the *London Times* and *New York Herald*, both in literary style and arrangement. A daily newspaper published in Melbourne for one penny

has already a circulation of over 50,000 copies. The journalistic enterprise of the proprietors of those papers has already been shown in the despatch of special representatives to China, Mauritius, New Caledonia, and to New Guinea, and through their efforts much interesting and valuable information respecting these little-known countries has been obtained. Every town and district has one or more newspapers, and a healthy spirit of criticism is maintained in all matters affecting the public interest.

"The law and regulations under which land for agricultural and analogous purposes passes from the Crown into the hands of private individuals differ in the various Australian colonies; in almost all, however, provision is made for persons desirous of settling on the land to select a limited area, generally 350 acres, and to pay the purchase money by instalments; the compliance with certain conditions of residence and improvements being also required before the selector becomes entitled to Crown grants. The time allowed to pay the purchase money differs, the maximum being twenty years, as is the case in Victoria, and the minimum ranges from three to six years throughout Australia.

"The chief productions of the soil of Australia are wheat, oats, barley, rye, maize, sugar, cotton, hops, arrowroot, peas, beans, potatoes, hay, and fodder grasses; also of fruits—grapes, olives, oranges, lemons, citrons, limes, figs, pine-apples, bananas, passion fruits, and some spices; also apples, pears, strawberries, raspberries, gooseberries, currants, together with a host of other fruits belonging to the tropical, to the sub-tropical, and temperate zones of the earth. Even the kitchen garden is full of fine flavored vegetables; in short, the products of the soil are so abundant, and so full of food elements, that everything can be grown to make a nation independent for food products as well as for table luxuries.

"There are in Australia about 3,000,000 of inhabitants (outside the aborigines of the country, whose numbers are few). The bulk of people are English, Irish, and Scotch; the native-born population is, however, increasing every year; at present they number two-thirds of the community. The bulk of the people are actively employed in trade and commerce, farming, mining, manufactures, and other industries in close alliance with them. The output of these industries covers the chief wants of the home consumption, and leaves a large margin for export.

"The chief exports are wheat, and many of the other cereals, including maize (grown in New South Wales in great quantity), flour, wine, biscuits, machinery, preserved meats, frozen meats, sugar, leather, skins, saddlery, jams, soap, tallow, wool, gold (both bullion and specie), copper, tin, and antimony ores, hardware, oilmen's stores; these amount in sterling gold annually to many millions.

"The export of horses from Victoria amounts to many thousands annually; last year the value of the horses shipped from Melbourne amounted to £185,295 sterling. I have not at hand the amount of this export from New South Wales, but in that colony the trade of shipping horses has not assumed such large proportions as in Victoria. These two countries have large tracts of lands where horses thrive wonderfully in some of their mountain fastnesses.

"The gradual rise of viticulture in some parts of Australia has led to the establishing of an extensive wine industry, and yearly it is assuming greater proportions.

"The vine—a word signifying 'the best of trees'—although known and cultivated for ages, requires, even to the present day, by every vinegrower a student's attention; it has a frame delicate in structure, and a constitution proverbial of many changes. Climate, soil, and aspect are the chief considerations when forming a vineyard. The fruit, like the plant, is subject also to change; a well-known variety suffers both in flavour and lusciousness if deprived of one or all of these conditions. Our vignerons follow carefully these lines. The genial climate and every needful condition for vine culture existing in many parts of Victoria, South Australia, and New South Wales stamp Australia as a vine land; no part of the world can produce either table or wine grapes superior to those grown in the parts named.

"In the production of wine from grapes many considerations step forward. Grapes containing all the essential elements for wine fail to produce any degree of excellence unless manipulated with much care and judgment; hence, in the early days of wine-making in Australia many failures in this respect ensued, and wines were sent out faulty in character. During the past seven years greater attention has been paid, and the chemistry of wine-making is now thoroughly studied and practised.

"To-day you have in the Australian Courts wines, light and dry, fruity and full-bodied, sparkling and clear; bouquets delicate and rich. There are nearly 100 different exhibitors. The lists of wines given in the different catalogues of the several Courts contain burgundy, claret, chasselas, hermitage, reisling, sauterne, sauvignon, hock, muscatel, mataro, Pedro Ximenes, port, sherry, and last, though not least, champagne.

"The art of chemistry, now so freely applied in the production of artificial wines, needs the special attention of connoisseurs in determining the genuine from the artificial, for, however careful their selection may be, they are liable to be deceived; the aroma, palate, and colour now so closely imitated will at times deceive the best of judges. A natural alcohol produced during the fermentation of the grape can always be detected, and can never be equalled in arousing the sluggish vitality of invalids or for cheering the heart of man by any alcohol other than the product of the grape.

"Wine is the fitting stimulant for man, and the more a country directs its attention to the use of this beverage as against ardent spirits, the better will be its people in point of sobriety, intellect, and influence. 'Wine is milk to the aged, and milk is wine to the young.'

"Australian wines are made absolutely from the expressed juice of the grape. One fault committed by some of our wine-producers was that they sent out wines for consumption too young, that is, under three years of age. Wines require time to mature; when young they contain a tartar—termed cream of tartar—which is not thoroughly deposited either in wood or in bottle for a

considerable time; hence during my journeyings through India, I have occasionally heard the complaint of the tartness of some of the Australian wines. The error of young wine having been supplied is now well known by our vignerons, and older wines may be relied upon in the future.

"The extent of our vineyards in acreage varies from 3 up to 300 acres each. At the end of 1882 there were in Victoria 5,732 acres under wine cultivation, in New South Wales 4,448 acres, in South Australia 4,312 acres, and the other colonies have also a good acreage, but the exact amount I do not know. Many of the wine cellars are very large. The St. Hubert's Company, one of the largest wine-growers in Victoria, have in their cellars at the present time 150,000 gallons of wine. Fallon's cellars at Albury are also very large, and contain many thousands of gallons. Numerous other cellars belonging to the vignerons have great quantities maturing for the markets, and are now yearly shipping to Europe fine wines, and they hope shortly to be able to add India also. Before I leave the subject of wines, I must refer to a new and large wine industry rising up in Australia, I allude to champagne. Up to the present the whole of the Australian wines sent into the market receive their names from the grape from which it is made. Vignerons have not yet generally adopted the 'art' followed in Southern Europe of blending one wine with the other. Champagne is generally, if not altogether, a 'blend'; one company, viz., the Champagne Company of Victoria, have at the present time in their extensive cellars over 30,000 gallons of light choice wines maturing for champagne, and about 200,000 dozens of champagne is ready and in process of maturing for the market.

"The rise of the real producing interests in Australia, outside her wool and tallow, does not date back more than a quarter of a century, yet from what I have said I think I have shown that Australia does not come to India at the present time without claiming fairly its readiness to enter into closer commercial relations than heretofore with this empire.

"Australian productions, either as products or as manufactured goods, are not meagre; her manufactures are extensive, full of the latest mechanical improvements; her artisans do not lack either knowledge, intelligence, or industry; her merchants and commercial men will bear comparison for upright conduct, strict probity, and liberal considerations in all business relations with any elsewhere. The yearly increasing magnitude of her resources, both in raw materials and manufactured goods, give her the power to go outside and enter into the other markets. Her rise and progress during the past three decades have been not only rapid, but her people are settled and fixed; no desire to seek 'fresh fields or pastures new'; the sequence follows—her industries and manufactures are firmly established, there is no desire, therefore, to keep her industrial labour confined within the radius of the Australian group; for, notwithstanding the variations of the tariff of the several colonies, and the principles which have guided each one in its separate policy, yet each is fully alive to the value and to the necessity of opening up markets in other countries for the disposal of their products and manufactures.

"The Australian colonies do not come here in the spirit of rivalry one with the other. As years have rolled on, Australia's public men have learnt that mere divisional lines on the map of Australia *must* not give strong class jealousies, envyings, or evil speaking. The iron horse has brought, and is bringing, more and more each succeeding year, the great cities and country districts of each colony into closer ties of relationship. The well-being of Australia does not lie within the circumscribed limits of any one of her separate colonies; her wealth and influence is only to be obtained by united action, be it in the protection of her coasts from an enemy, or in the extension of trade and commerce.

"And now I come to a subject which I am sure possesses for all present a deep interest, viz., the development of trade between the continent of Australia and this vast and wealthy empire. I have attempted to show how boundless are our resources, and the special advantages which we may fairly claim to possess in the way of soil, climate, and powers of production. Forming as we do part of the same great Empire, and owing the sway of the noble Lady who has so long and so honorably wielded the sceptre of State, it is but natural that many of our interests should be identical. At present Australian produce is forwarded direct to London and other great emporiums of the Old World, and then finds its way to India by circuitous channels. What is required to develop trade and draw us closer together is direct communication by means of fast and regular steamers; and I think, ladies and gentlemen, that the present is an opportune time to seriously consider the question. I find that from figures recently published, the trade between the two countries increased last year by nearly eleven lakhs of rupees; and this notwithstanding a decline in the number of horses supplied—and until recently, horses, as you know, formed almost the only branch of trade with India, so far as Australia was concerned. With the establishment of direct steamers between the Australian and Indian ports, new avenues of exchange would be opened up which at present are impracticable. Dealing with the question of food-supply alone, it will be seen that Australia is in a particularly good position. In the matter of cultivation, South Australia, with an area of 903,425 square miles, has 2½ millions of acres under crop; New South Wales, possessing a territory to the extent of 309,175 square miles, has 733,528 acres; while Victoria, with 87,884 square miles, has no less than 2¼ millions of acres in cultivation. In respect to wheat and other cereals, we can hardly expect to supply India, herself a great grain-producing country, but such commodities as sugar, flour, and wines can be furnished to any extent. Pursuing, however, the list of products which Australia is prepared to contribute, I will take next meat, tinned and frozen. Australian beef and mutton has already obtained a firm hold in the London market, and that you may better understand our producing powers in that direction, I will give you a few more figures. New South Wales, the oldest of our pastoral colonies, has no less than 2¼ million head of cattle, and 36½ million sheep; Victoria coming next with nearly 1½ million head of cattle, and 10½ million sheep; South Australia has 315,000 head of cattle, and nearly 7 million sheep; while Queensland, Western

Australia, and Tasmania possess extensive herds and flocks. Australian wool commands the highest prices in the world; some of the finest merino clips realising the value of raw silk. In the onward march of progress, the time may not be far distant when India will become a great cloth manufacturing country, and it is not, therefore, premature to suppose that in the list of articles which we are to supply, wool will occupy a prominent place. Of the horses raised in Australia, most of you present can possibly speak from experience. Much attention has been paid to improving the breed of horses, as well as of other live stock in the colonies; and judging of recent performances, there is every reason to believe that the 'Walers' of the future will maintain their present high reputation. That there need be no reason to fear any diminution in the supply may be inferred from the fact that New South Wales possesses 370,000, Victoria nearly 300,000, and South Australia 160,000 horses, the other colonies also possessing between them half a million more. To the horse trade we owe the only direct communication hitherto enjoyed; the steamers conveying these animals naturally avoiding any detentions on the way. They have demonstrated the practicability of the scheme, and as back freight to the colonies is nearly always available, it only remains for the Indian people to afford us the opportunity of consigning products other than horses to commence at once. Fresh fruit, which forms a desideratum in hot countries, butter and other dairy produce, could be supplied without limit, and at remarkably small cost, if a direct steamer left at regular intervals fitted up with a freezing chamber. What a boon this would be in your hot months can well be imagined. Grapes of the most luscious varieties, and all kinds of English and tropical fruits, are sold in Australia at prices which would admit of their being landed here at two or three annas per pound; and then leave a good margin of profit. Australian copper you already receive, and both coal, tin, antimony, silver, and gold can be supplied to a practically unlimited extent. Hides, leather, and all kinds of tweed and woollen fabrics are amongst the products for which a good market should exist, but the list is, in my opinion, almost inexhaustible. The pure natural wines of Australia are now finding an honoured place amongst the best vintages of Europe, and for India they may claim to be specially adapted.

"In return we offer the people of India a good market for their tea, rice, dye materials, silks, cotton, jute goods, paper-making fibres, and nearly all the products for which she is famed. Reciprocity is certain to follow any attempts made here to open up direct trade, and that such an attempt may be made I sincerely trust.

"I have lingered thus much over a country I have lived in for 35 years, and as I have no desire to weary you, suffice it for me, in conclusion, to add—that her laws and government are thoroughly British, her people are manly and vigorous, active in labour and in politics, are not morose, enjoy fun as much as they enjoy their daily bread, and maintain civil and religious liberty for all men. Her public men are outspoken, and watch well her present and future advancement.

"A strong and national feeling is gradually overcoming petty colonial differences, and legislation is tending in the direction of a federal union, binding her together as a nation, and so making her to become the Power of the Southern Hemisphere.

"Do signs for evil appear from within or without? Her public men grasp the reins of State firmly, without flinching. Is it a Foreign Power hovering round her shores for the purpose of taking possession of New Guinea, that is close by, to pour into it her outcasts and condemned? They rise as one man, put their foot down, and say, 'We will have none of it.' Does such an action for the moment disturb the equanimity of the mother-country, and give to the world outside the impression that Australia is wavering in her loyalty? The public men of Australia know their duty to her people and to the Crown of England. They know that views firmly expressed and loyally addressed to the Throne of Great Britain receive in these days of her enlightenment every consideration, and, whatever may be the ultimate decision, Australia will remain as ever loyal and dutiful to the Crown of England, and the Queen-Empress revered and loved by her Australian subjects."

Mr. Keswick then rose and said: Ladies and gentlemen, Mr. Bosisto has given us a most instructive and interesting lecture, and deserves our very best thanks. I would say, with reference to commercial relations between this country and Australia, that I quite agree with him that direct steam communication would be very desirable, and I have no doubt that there is enterprise enough to bring this about, if only we can see the way; but there is the rub. If the Government of the Australasian Colonies and our own Government would join in subsidizing such a line, then everything would be well. (Hear, hear.)

M. Joubert said, it was a pleasurable task to him to propose a vote of thanks to the honorable lecturer, whose acquaintance, he was proud to say, he had enjoyed for five and thirty years, and that in his opinion a more fit exponent could not be found of the circumstances and resources of the colonies than Mr. Bosisto. (Loud applause.)

The Honorable Member for Richmond, Victoria, responding, said: Ladies and gentlemen—I thank you very much for the way in which my lecture has been received. I thought I could not leave India without telling you something about the country I have come from, which I love and admire; and if any of you should ever visit the colonies, I can safely say that you will find nothing which has fallen from my lips with respect to them in the least bit exaggerated. I am sorry to have kept you so long, but I have endeavoured to deal comprehensively with a subject which is inexhaustible, and to my mind could not be treated of less briefly. I beg to return you my warmest thanks for your kind attention. I must conclude by asking you to join with me in a vote of thanks to the chairman.

A few visitors remained to avail themselves of the lecturer's invitation to pronounce an opinion upon the choice selection of Australian vintage.

APPENDIX C.

The following communication was read at the final meeting of the Commission, held in the Melbourne Town Hall, on Wednesday the 9th day of July, 1884:—

Board Room:—The Melbourne Exchange.

Offices:—38 Elizabeth-street,
Melbourne, 7th July, 1884.

The President and Members of the
Royal Commission for the Calcutta Exhibition.

GENTLEMEN,

The Exhibition having been brought to a close, the Council of the above Chamber desire me to convey to you an expression of their warmest admiration at the manner in which the interests of Victoria and her manufacturers were promoted thereat, and instruct me to express their warmest thanks to your President for his personal attendance at same; and their most heartfelt appreciation of the zeal, energy, and tact displayed by your Secretary in the performance of duties requiring a courtesy and judgment upon which this Council showed their reliance when originally supporting Mr. James Thomson's candidature for the post.

I annex extract from this Council's Annual Report on this subject,

And remain, Gentlemen,

Your most obedient servant,

W. H. C. DARVALL,
Honorary Secretary.

[EXTRACT.]

"Your Council have much pleasure in referring to the International Exhibition recently held in Calcutta, to which several of the members of this Chamber forwarded exhibits, and at which some—notably Mr. Joseph Bosisto, M.P., to whom a gold medal has been awarded for 'Eucalyptus preparations'—have gained first class honours. And the Council are of opinion that the best thanks of this Chamber, and of his fellow colonists generally, are due to Mr. Bosisto, as the President of the Calcutta Exhibition Commission, for his personal attendance at the Exhibition, and the able manner in which, during his sojourn in India, he laid himself out to advance the interests of, and gain information likely to be of service to, this his adopted country.

"Your Council also desire to record their extreme gratification at finding that the gentleman whose candidature for the secretaryship to the Commission of this Exhibition they supported (Mr. James Thomson), has carried on his duties with a zeal and tact which has not only given every satisfaction to the members of that body, but has tended in no small degree to further the manufacturing and other interests of Australasia, in a land with which consequently there will doubtless be in future a large and mutually beneficial interchange of indigenous products and manufactures."

APPENDIX D.

DONATIONS OF SEEDS, ETC.

The following is a List of Indian Seeds, from the Eden Gardens, Calcutta, presented to the Royal Commission for Victoria, and distributed to various Botanic Gardens, Agricultural Societies, &c. :—

1. Mimusops Elengi ...	... Forest tree.	16. Thespesia polulneoides ...	... Forest tree.
2. Hamatoxylon campechianum ...	... "	17. Inga hamatoxylon ...	... Large shrub.
3. Bina orellana ...	... Large shrub.	18. Clitoria ternatea ...	... Creeper.
4. Cæsalpinia paniculata ...	... "	19. Duranta Ellisia ...	... Shrub.
5. Lawsonia alba ...	... "	20. Stachytarpheta orubica "
6. Acacia serissa ...	... Forest tree.	21. Combretum pilosum ...	... Creeper.
7. Tectona grandis ...	... "	22. Ipomoea tridentata "
8. Casuarina muricata ...	... "	23. Pongamia glabra ...	... Forest tree.
9. Tecoma stans ...	... Large shrub.	24. Poinciana regia "
10. Æschynomene sesban ...	... "	25. Pterospermum acerifolium "
11. Gauzuma tomentosum ...	... Forest tree.	26. Melia sempervirens "
12. Cassia glauca ...	... Large shrub.	27. Putranjiva Roxburghii "
13. Cassia fulgens ...	... Forest tree.	28. Bauhinia pupurea "
14. Cassia fistula ...	... "	29. Amoora rohituka "
15. Cassia ata "		

One packet, Divi divi.	One packet, Alstonia nerifolia.
" Casuarina muricata.	" Antigonon leptopus.
" Artabotrys odoratissimus.	" Duranta Plumieri.
" Meha Bukayum.	" Tipparee seeds.
" Coffea Arabica.	" Mimusops Elingi.
" Petospermum acerifolium.	" Hibiscus sabdariffa (red sorrel).
" Seed of sterculia elata.	" Poinciana pulcherrima.
" Albezzi lobu.	" Clitoria (blue flower).
" Lawsonia alba.	" Clitoria, white.
" Cedrus deodora.	" Acalypha glabrata and marginata.
" Croton retusa.	" Reana luxurians.
" Sola seed.	" Sappan wood.
" Pinus longifolium.	" Acalypha marginata.
" Putranjena Roxburghii.	" Corypha elata.
" Carryota sobolifera.	" Bignonia superbossa.
" Amooro rohataka.	" Bauhinia acuminata.
" Croton Tiglium.	" Bixa.
" Canna, of sorts.	" Chillies.
" Croton retusa.	" Tictona grandis (Teak).
" Desmodium gyrans.	" Calophyllum mophyllum.
" Bauhinia.	" Gunzuma tomentosa.
" Poinciana regia.	" Terminalia arjuna.
" Abroma fastuosa.	

EIGHT WARDIAN CASES of Rare Plants were also presented by Dr. George King, Superintendent of the Royal Botanic Gardens, Seebpore, Calcutta, and were brought over in charge of the Secretary. These have been distributed to the Melbourne, Geelong, Ballarat, Castlemaine, and Sandhurst Botanic Gardens.

LIST OF SEEDS AND PUBLICATIONS FROM THE AGRICULTURAL AND HORTICULTURAL SOCIETY.

SEEDS.

No. 1. Vigna catiang.	No. 15. Hibiscus esculentus.
" 2. Cucumis melo (melon).	" 16. Croton juncea.
" 3. Phaseolus vulgaris.	" 17. Corchorus olitorius (jute).
" 4. Canavalia cusiformis.	" 18. Amaranthus polygamus.
" 5. Pachyrrhizus angulatus.	" 19. Amaranthus, sp.
" 6. Cucumis sativus.	" 20. Amaranthus "
" 7. Hibiscus sabdariffa.	" 21. Amaranthus atropurpureus.
" 8. Luffa acutangula.	" 22. Basella cordifolia.
" 9. Luffa Ægyptica.	" 23. Beta Bengalensis (beet).
" 10. Momordica churantia.	" 24. (Matteo) Trigonella fœnum Græcum.
" 11. Lagenaria vulgaris.	" 25. Anethum sowa.
" 12. Benicasa cerifera.	" 26. Cucurbita citrullus.
" 13. Trichosanthes anguina.	" 27. (Brinjal) Solanum melongena.
" 14. Raphanus sativus (radish).	

PUBLICATIONS.

Transactions of the Agricultural and Horticultural Society, Vol. I. to VIII. ... 8 copies.

Journals— <i>Old series</i>	...	Vol. IX., parts II. and III.	...	2	"
"	...	" X., " I., II., and III.	...	3	"
"	...	" XI., " I., II., III., and IV.	...	4	"
"	...	" XII., " I. and II.	...	2	"
"	...	" XIII., " I., II., III., and IV.	...	4	"
"	...	" XIV., " I., II., III., and IV.	...	4	"
Journals— <i>New series</i>	...	" I., " I., II., and IV.	...	3	"
"	...	" III., " I. and II.	...	2	"
"	...	" IV., " I. and II.	...	2	"
"	...	" V., " I., II., III., and IV.	...	4	"
"	...	" VI., " I., II., III., and IV.	...	4	"
"	...	" VII., " I.	...	1	"

LIST OF SAMPLES OF PRODUCE FROM MESSRS. W. HAWORTH AND Co., FOR THE
VICTORIA ROYAL COMMISSION.

1 sample of Linseed.	1 sample of Bengal Cotton (fully good).
" Yellow Rape seed.	" " (good).
" Brown "	" " (fully good fair).
" Poppy seeds.	" " (good fair).
" Wheat.	" Jute (good to fine).
" Castor seed.	" Orange Shellac (G in double diamond, S L under).
" Bahmia Cotton.	" " G. F.
" Rice (Seeta).	" " B in octagon.
" " (gross table).	" " S. B.
" " (Ballam).	" " D. G.
" " (Rarry).	" " N. M. K.
" " (Kherry).	" Garnet Shellac O. C. C.
" Bengal Cotton (fine).	" Button Lac N. M. K.
" " (fully good to fine).	

LIST OF SAMPLES OF BAGS AND GUNNY CLOTH FROM MESSRS. APCAR AND Co., FOR THE
VICTORIA ROYAL COMMISSION.

E. Plain, 40" x 29" (unhemmed)	...	...	5 bags	...	5 yds. of cloth.
No. 1 Plain C., 40" x 28" (hemmed)	...	...	5 "	...	5 "
No. 2 " C., 40" x 28" "	...	...	5 "	...	5 "
No. 2 Stripe C., 40" x 28" "	...	...	5 "	...	5 "
R. and B. Twills, 44" x 26½" "	...	...	5 "	...	5 "
Hissian Wheat Bags, 36" x 22" "	...	...	5 "	...	5 "
			<u>30 bags</u>	...	<u>30 yards.</u>