COTTON CULTIVATION AND SUPPLY. A striking picture of the present state of the cotton supply for the factories of Great Britain was presented by Mr. Dawson, in a paper read at the meeting of the British Association in 1856, 'On the Connection between Slavery in the United States and the Cotton Manufacture of the United Kingdom.' His statistics and reasonings tended to establish these five propositions: 1st. That cotton, from the conditions of climate necessary to its culture, cannot be grown in Europe; but that, on the other hand, with the single exception of the factories of the New England States of America, it is, and must long continue to be, manufactured almost exclusively in Europe. 2nd. That the present supply is chiefly raised, and for the present must continue to be raised, by slave labour; seeing, that while for fifty years we have sought over the whole earth for cotton, we have during that time continued to obtain from the slave states of the American Union a continually increasing proportion of our entire supply. 3rd. That two-thirds in number at least of the slaves of the United States have been called into existence, and are now directly or indirectly maintained, for the supply of cotton for exportation. 4th. That of the cotton thus exported, three-fourths at least in value are raised for, and sent to, this country alone. 5th. That of the entire quantity we import, four-fifths at least in value are thus derived from the United States. The summary assumed the following remarkable form: Two-thirds of all the slaves in the cotton-growing districts of the United States are employed in supplying raw material for the cotton manufactures of our own country; and four-fifths of all the cotton-workers in Lancashire and other northern counties are dependent on the supply which those slaves raise. Some of these statements and ratios may not be strictly correct, but the general result is sufficiently near the truth.

By what steps this gigantic state of things has been produced, and in what direction future changes will have to be sought, we shall now proceed to show, by a rapid glance at the chief cotton-growing districts of the world. This, however, may usefully be preceded by a few paragraphs relating to the culture.

The finest kind of cotton, which commands the highest price, is called "Sea-island cotton," from the circumstance of its having been first cultivated in the United States of North America, in the low sandy islands on the coast, from Charleston to Savannah. This variety will not flourish at a distance from the sea, and it is said that its quality is gradually deteriorated in proportion as the plants are removed from "the salutary action of the ocean's spray;" it succeeds best in South Carolina, Georgia, and Florida. This cotton is composed of filaments longer than those of any other variety; which circumstance, joined to its even and silky texture, fits it for the production of the finest yarns. The seed is black, and in the southern states of North America it is thence frequently called "black-seed cotton," to distinguish it from the short-staple cotton produced in the interior of those states, and which, from a like natural cause, is distinguished as "green-seed cotton." The seed of the sea-island cotton is sown every year; but the plant, when cultivated within the tropics, will live and yield harvests for several years in succession. It is supposed to have come originally from Persia. The plant was taken from the little island of Anguilla to the Bahamas for cultivation, and was first sent thence to Georgia in 1786; but it is not said how the seed found its way to Anguilla. The supply is small, and the price always relatively higher than other kinds. "Upland" or "Bowed Georgia cotton," the green-seed kind, has received its name of *upland* to distinguish it from the produce of the islands and low districts near the shores. The expression *bowed* was given as being descriptive of the means employed for loosening the seed from the filaments; this was accomplished by bringing a set of strings, attached to a bow, in contact with a heap of uncleaned cotton, and then striking the strings so as to cause rapid vibrations, and thus open the locks of cotton and cause the seeds to be easily separable from the filaments. The remaining kinds of cotton now brought to English markets are distinguished by names so plainly indicative of the countries of production, that it is not necessary to offer any description of them with that view.

To illustrate the operations in a cotton-field, it will suffice to select two examples—the short-staple upland cotton of the United States, which forms the bulk of all the cotton used in England; and the long-staple sea-island cotton, used for our finest muslins. The cultivation of all other kinds may be inferred from those two, sufficiently near for the wants of the general reader.

For cultivating the *short-staple upland* cotton, the planter prepares his land with a small plough, drawn by one or two mules, which walk rapidly over the ground. A negro slave usually guides the plough. This preparation takes place during the winter months; it consists of a ploughing, a harrowing, a second ploughing, and a heaping-up into flat-topped ridges. The sowing takes place between March and May: the earlier the better, provided the winter frosts are gone. Some planters deposit the seed in furrows opened by a light plough; while others carefully dibble the seed at equi-distant intervals. The dibbling is considered the better of the two methods. A man proceeds rapidly along, making holes in the ridge with his dibble at intervals of twelve inches; a woman follows him, dropping five or six seeds in each hole; and a boy or girl comes in the rear, covering the holes with earth by a light hoe. By much practice under the eye of a vigilant overseer, the negroes become very expeditious in these processes. Drilling machines have not yet been found to work well; for the upland cotton-seeds being furred by the lint or fibre still adhering to them, and being very adhesive one to another, do not deliver well from the drill. When the young plants shoot forth, the weakest are cut away, leaving only two in each hole; and the holes which have failed are supplied by re-sowing; but the chief attention is bestowed on frequent weeding, which is essential to the cleanness and excellence of the crop. The weeding is mostly effected with the aid of light and straight hand-hoes. If the crop has pretty well escaped the attacks of vermin,

insects, and storms, it is ready for picking in August. The plant continues to produce and ripen its bolls of cotton until the frost comes; and it is therefore a matter of nice calculation with the planter to delay his picking, so as to get as much as possible, and yet not to run the hazard of a frost. During the picking season, every hand is brought into requisition. Each picker fastens a bag round the waist, into which he (or she) throws the cotton bolls as they are picked; and when the bag is full, it is emptied out on a sheet; when the sheet contains as much as it will hold, it is carried to the weighing-house. A good hand will in a fair field pick 200 lbs. a day; but the average is less than this. Successive pickings are made as the bolls grow and ripen, until the quantity no longer pays for the labour. It is exceedingly difficult to state the average produce per acre: much of the land in Carolina and Georgia will only yield 100 lbs.; an excellent return in these states is 200 lbs.; the average in the teeming valley of the Mississippi is 400 lbs.; while careful culture on special spots is rewarded with a much higher return. Some of the plants, under favourable circumstances, will yield 400 bolls in one season, weighing 4½ lbs., which will afford 1¼ lb. of ginned or cleaned fibre. The picking requires some dexterity; it is essential to get every particle of cotton from the boll at one pull, without any leaves or other foreign matter adhering to it. It is laborious work, on account of the stooping required; the pickers' hands become sore, and there is a liability to colds and rheumatisms, owing to the wetness of the bushes in the cold autumn mornings, occasioned by heavy dews at night. Some planters provide their slaves with waterproof aprons and skirts for this season; but others are not so considerate. When sufficient cotton has been collected, a machine called a *gin*, which costs the planter from 16*l.* to 24*l.*, is employed to separate the fibre from the seed. A screw-press, costing from 30*l.* to 50*l.*, is next employed to press the fibre into bales of about 400 lbs. each. Directly it is packed, the planter sends his cotton to market; and from the month of August to November the roads exhibit trains of waggons, carrying the cotton from the plantations to the shipping ports or the river stations. Mr. Leonard Wray, who has visited cotton plantations in various parts of the world, says, in relation to the upland cotton of America: "It is usual in the States to calculate the crop at so many acres to the working 'hand' (as the slave is denominated). Thus, a cotton-planter with 50 good working hands, great and small, and 25 mules, would consider his strength equal to 500 acres of cotton and 400 acres of corn, or to 1000 acres of cotton alone, provided extra hands are allowed for picking the crop. This is the general mode and rate of calculation where the soils yields about 200 lbs. of ginned cotton to the acre; making, therefore, to the 'hand' 2000 lbs. of cotton, which, at 5*d.* per lb. on the spot, is worth about 40*l.* sterling, besides the value of the Indian corn raised." Most cotton-planters grow corn enough for the supply of their slaves, and some have a large surplus for sale.

The *long-staple* or *sea-island* cotton, eagerly bought at a high price by the spinners of fine yarns for muslins and lace, is cultivated in the same general way as the short-staple, but with peculiarities which need only be glanced at here. According to the nature of the ground, as to level, moisture, and stiffness, the planter regulates the height of his ridges, the kind and amount of manure used, and the closeness of sowing. The produce is so much more valuable than upland cotton, that 200 acres of the one will have a money value equal to 1000 acres of the other; and thus it pays the sea-island cotton-planter to bestow much care on all his operations. The sea-island seed would admit of being sown by the drill; but there is very little machinery employed in the slave states, and most of the sowing is still effected by the dibble. The picking, as for the short-staple, usually commences in August, but requires much more care and attention. When picked, the bolls are slightly dried and examined to reject any which have become discoloured or injured in fibre. They are next kept for some time covered over in large heaps, to preserve the oiliness, strength, and gloss of the fibre, which would be injured by much exposure to the air; but this operation requires much caution, to prevent fermentation by heat, and the soiling of the fibre by the oozing out of oil from the seed. When the time for sending to market arrives, the cotton is taken from the heap and subjected to the ginning process, as a means of separating the fibre from the seed. The quantity of sea-island cotton grown being much smaller than that of upland, the processes are conducted on a less extensive scale; and the separation is usually effected, not by the gin, but by a more primitive instrument called the *churka*, similar to that which is employed by the Hindoos. This churka consists of two wooden rollers, eight or nine inches long by one inch in diameter, placed horizontally and in contact, one above the other; when these revolve, the fibres of cotton are drawn between them, and the seed left behind. The cotton is fed in by hand, while the rollers are made to rotate by means of a treddle. The machine will only clean from 12 lb. to 20 lb. in a day. Most of the planters adhere to this primitive method, under an impression that a more rapid or rough treatment would injure the delicate fibre of this highly-prized cotton. The correctness of this opinion is however denied by the more enterprising among the number, who use larger machines worked by steam-power, without any deterioration of the material. The cotton, cleared from its seeds, motes, and discoloured particles, is then pressed down into long cylindrical bags, quite different in appearance from those employed for upland cotton, and with less intense pressure, lest the fibre should be injured. The small quantity and high price of this variety render the market more uncertain than that of the coarser kinds. Mr. Wray says on this subject: "After his produce is all fairly bagged, the difficulties of the planter are not ended; he has sometimes considerable trouble and has to wait a long time before he can find a buyer for it. Not unfrequently he has to ship it to Europe, and encounter manifold risks and chances. This, indeed, constitutes the greatest disadvantage under which he labours. The upland cotton-planter makes his bale of cotton to-day, and to-morrow he has cash in hand for it; or perhaps he is even paid for it before it has left the trees. Not so, however, with the sea-island cotton-planter; he is obliged to exercise all his patience before he can sell his crop; and in the meantime, although lord over 200 to 400 slaves and a fine estate, he is very probably compelled to use his broker's name in obtaining cash from the banks wherewith to pay the current expenses of his estate." The sea-island cotton yields more seed than the upland, and this seed is more smooth, clean, and oleaginous, thereby being better fitted for yielding cotton-seed oil. The produce is much less per acre of sea-island than of upland; 200 lbs. of clean fibre is about the maximum, while some fields barely yield 50 lbs.; the hands pick smaller quantities per day, and conduct the picking more carefully. The muslins, famous for their fineness, spun and woven by the Houldsworths and other firms who attend more particularly to this kind of work, are mostly made of sea-island cotton. Small parcels of special excellence will sell for 3*s.* or 4*s.* a pound, while French lace-makers will sometimes give as much as 6*s.* One pound of such cotton can be spun into a *thousand miles* of yarn, which may be wrought up into lace worth 250*l.*

The present may be the most convenient place in which to advert to certain auxiliary commercial advantages resulting from the cultivation of cotton,—advantages not yet much attended to, but which may in future years possibly become very important. The fibre is, of course, the chief product for which the cotton-plant is cultivated, but it is not the only one. The plant yields a pure, bland oil, equal to that of the olive; an oil-cake, most excellent for feeding cattle; and a fibre from the bark, which would possess commercial value if collected and shipped. Even in the greatest of all cotton-growing countries, the United States, the oil contained in the seed has scarcely yet been rendered available; but Dr. James Coxe, of New Orleans, has (in 1857) drawn the attention of his countrymen to the subject. His estimate may be somewhat overdrawn, as such estimates frequently are; but the figures presented are certainly worthy of notice. The average cotton crop of the United States may be roughly given at 3,000,000 bales of 400 lbs. each, or 1,200,000,000 lbs. of ginned cotton. To each pound of fibre there are 3 lbs. of seed, making 3,600,000,000 lbs. of seed in all. Of this enormous quantity, 1,800,000,000 lbs. are retained for re-sowing, including waste. The remaining 1,800,000,000 lbs. are available for yielding oil and oil-cake. It is found that 100 lbs. of seed will yield 2 gallons of this oil, worth 4*s.* per gallon at New Orleans and 6*s.* at New York. After the pressure there will result 48 lbs. of oil-cake, equal in quality to that of linseed. There will furthermore remain about 6¼ lbs. of oleaginous refuse available as soap-stuff, capable, when combined with very cheap alkali, of making 20 lbs. of useful soap. Summing up these items, they present the following money values: 36,000,000 gallons of cotton-seed oil at (say) 75 cents (3*s.* 2*d.*), 5,400,000*l.*; 864,000,000 lbs. of cotton-seed cake, at 1 cent (½*d.*), 1,728,000*l.*; and 106,000,000 lbs. of soap-stuff, at 3 cents (1½*d.*), 636,000*l.*; making a total of 7,764,000*l.* The bark-fibre is another prospective source of profit, the value of which remains to be determined. It has not yet been shown whether the oil is most likely to be useful as a salad oil, a fuel for lamps, a material for soap, an oil for leather-dressing, or a lubricator for machinery; but all these matters would speedily be settled if the oil became a regular marketable commodity. The oil-cake maintains a good place as a cattle-food, seeing that it contains from 9 to 16 per cent. of oil and 25 to 30 per cent. of albuminous compound.

We are now in a position to glance at the several cotton-growing countries, and to ascertain how much cotton they grow annually, what proportion of it is sold for manufacture in Great Britain, and what are the chances for an increased supply.

United States Cotton.—It is a remarkable fact that, while the production of this article has increased at a great rate in America, it has diminished in many other countries. This result has been attributed to various causes; among which may be mentioned, the good quality of American cotton, the low price of land there, and the great improvements that have been made in cleaning the cotton from its seed by means of Whitney's saw-gin, introduced in 1793. It is evident, however, that the greater part of these advantages might have been shared by many other countries in which the soil and climate are equally favourable for this branch of husbandry; and it will probably be more in agreement with the fact if we attribute the success of the American planters to their greater intelligence and industry, seconded by the commercial enterprise by which their country is characterised. Land fresh brought under cultivation in the United States will yield double the produce obtainable in the older states. One able-bodied labourer is sufficient for each eight acres of land, if assisted in the lighter part of the work by the aged and infirm, and the young people who belong to their families; the whole will, at the same time, be able to cultivate from five to eight acres of provision ground. The proportion of able-bodied labourers in each 100 of the entire working population of the

cotton-growing districts in America, was estimated a few years ago at 32; the proportion of young persons not yet arrived at their full strength, and of elderly people still capable of some degree of labour, 25; the remaining 43 being composed of children under 14 years of age, and superannuated persons, none of whom are capable of any but very light work, such as weeding and picking the cotton. There is reason to believe, however, that these ratios vary at different times. It was estimated in 1836, that the whole quantity of land cultivated for cotton in the United States was two millions of acres; that the capital employed for the purpose was 800,000,000 or 900,000,000 dollars; and that the whole number of persons engaged in field labour, picking, and otherwise assisting in the cultivation of cotton, and raising their own provisions, was about 680,000. If to these were added the aged, the infirm, and the very young children composing the families of the labourers, besides overseers, owners, and their respective families dependent on the cotton crop, it was supposed that a million of persons were at that time engaged in the growing of cotton in the United States. Of later estimates we shall speak presently.

The extension of the cultivation in the United States is noteworthy. In the year 1786 no part of our supply was obtained from that country; indeed it was not until the year 1800 that the amount thence obtained became otherwise than insignificant. During the present century the advance has been quite unprecedented. In the eight years 1850 to 1857, both inclusive, the produce rose to millions of *bales* annually. To appreciate the full force of these numbers, it may be well to notice that the weight of an average bale of United States cotton varied in those years from 418 lbs. to 445 lbs., giving a mean of about 430 lbs.* The total produce at the following periods, with the portion of it which was exported from the United States to Great Britain and other countries, was (in round numbers), as follows:

	Total Produce.	Exported.
	Bales.	Bales.
1850	2,204,000	1,589,000
1854	3,035,000	2,318,000
1857	3,057,000	2,251,000

The difference between the total produce and the quantity exported represents pretty nearly the quantity worked up in the cotton mills of the United States. Applying the mean of 430 lbs. per bale, we shall find that on an average of the eight years, 1850–1857, the United States grew 2,960,000 bales, or 1,272,000,000 lbs. of cotton annually, of which 2,290,000 bales or 985,000,000 lbs. were sold to other countries.

The prices of United States cotton have varied considerably. In the year 1806 they ranged from 15*d.* to 24*d.* per lb.; in 1820, from 11*d.* to 17*d.*; in 1830, from 7*d.* to 9*d.* In 1845 the quality called "middling bowed" was 4⅜*d.*; and in 1848 it was 4¼*d.* Taking all the qualities together, the average price varied, in the eight years from 1850 to 1857, at New York, from 4½*d.* to 12¾*d.* per lb., and the aggregate yearly values varied, in round numbers, from 21,700,000*l.* to 36,000,000*l.*, which was the value in 1857. When the price at Liverpool is 4½*d.* per lb., it is considered that this is made up thus: 3*d.* for all expenses and profit of growing, and 1½*d.* for further expenses till warehoused at Liverpool.

In 1857 the cotton manufacturers of Great Britain became very uneasy at their prospects of a supply of raw material. Their dependence on the United States was rendered every day more and more evident. Deficient crops and increasing demand drove up the price from 8·74 cents in 1855 to 12·75 cents in 1857. The American planters actually received most money in the year when the crop was smallest—showing how much there was in the trade partaking of the nature of a monopoly: a monopoly brought about, however, by our exclusive or protecting legislation. The English demand began to overtake the American supply about the year 1845; and ever since that date the state of the cotton crops in the United States has been a subject of yearly anxiety to the Lancashire manufacturers. What foundation there may be for hopes in other quarters, will be seen in the third article of this series; but the pressing question with manufacturers at present is—Can the United States produce be so increased in quantity as to be lessened in price? The chief cotton States are Louisiana, Alabama, South Carolina, and Georgia; these produce five-sixths of the total quantity. It may

* It is necessary to bear in mind the singular variations in the weight of bales of cotton; otherwise the comparison between the produce of different years and different countries will lead to fallacious results. Some cotton-growing countries uniformly employ larger bales than others; while nearly all have exhibited a gradual increase in weight, possibly due to closer and more perfect packing. The bales of United States cotton have gradually increased from about 215 lbs. to an average of 430 lbs. during the present century. During the last eight years (1851–1858) the average weights of bales have ranged as follow:—

United States' cotton	430 lb. per bale
Egyptian	384 „
East Indies	276 „
West Indies	201 „
Brazilian	181 „

In view of the great preponderance of United States cotton, it is considered that *all* the cotton used in Great Britain may be now (1859) estimated at an average of 400 lb. per bale.

be well to give, for two recent years, the actual quantities in the eight cotton-producing States:—

	1856.	1857.
	Bales.	Bales.
Louisiana	1,661,433	1,435,000
Alabama	675,738	403,177
South Carolina	495,976	397,331
Georgia	389,445	322,111
Florida	144,404	136,344
Texas	116,078	87,882
North Carolina	26,098	27,147
Virginia	20,458	23,773

Some of the planters, believing England to be wholly at their mercy, advise a restriction rather than an extension of growth, in order that prices may be driven up still higher and higher. The merchants of New York, New Orleans, and the other shipping ports, however, more interested in the quantity of cotton to be shipped than in the price per pound, are making speculative estimates concerning the probable and possible in the cotton culture. Some computers, glancing at the capabilities of various parts of the United States, assert that there are 39 millions of acres of land fitted for growing cotton; that these would require 5 millions of slaves to tend them; and that the produce might be 8000 million pounds of cotton annually—many times the quantity at present worked in all the mills in the world. Hence there has been a sort of special pleading, to the effect that if Christendom would silently acquiesce in a renewal of the slave trade, there might be such an influx of slaves in the United States, and such an increased area of ground laid down in cotton, as to insure a lessening of price to English manufacturers. There are, on the other hand, many reasons for thinking that slave labour is really more costly than free labour; and that we ought to look rather to an increased supply of cotton from the East Indies and elsewhere, than to an extension of slave-raised produce in the United States. It would indeed be grievous if the hateful institution of slavery should be encouraged by the demand of England for raw cotton. There are agencies now at work which encourage a hope that such an evil may be averted.

South American Cotton.—The remaining portion of the American continent, as cotton growing districts, need not engage any lengthened attention.

The immense empire of Brazil does not occupy the rank which is due to it as a cotton-producing country. The total produce in sixteen years only varied from 19,000,000 lbs. to 35,000,000 lbs.; 1847 giving the smallest quantity, and 1850 the largest. The average may be about 25,000,000 lbs. This stagnant condition has been attributed to five causes: the abolition of the external slave trade, the dearness of labour, the ravages of insects, the peculiarities of climate, and the inaccessibility of the interior. Writers in the United States, especially those in the slave-holding interest, endeavour to show that all these difficulties must continue to prevent Brazil from being a flourishing cotton-growing country. There are other parties, however, who advocate the construction of a railway from Bahia into the interior, to a large district said to be eminently fitted for the culture. The Brazilian cotton is of good quality; and there certainly seems to be no sufficient reason for a continuance of the present apathy.

The other regions of South America need scarcely be named in connection with this subject. The coast districts of Peru and Chili have been found suitable for cotton cultivation; but the state of industrial enterprise has not hitherto been such as to lead to any considerable production.

West India Cotton.—It has already been stated that England relied upon the West Indies mainly for cotton, at a time when scarcely any was grown in the United States. In 1786 one-third of the English consumption was brought from the British West Indies, one-third from the foreign West Indies, one-quarter from Brazil, and the small remainder from the Levant. The British West Indian portion rose a little during the remaining years of the century; but from 1801 till the present time there has been a signal falling off. The yearly average quantity has gradually decreased from 84,000 bales in the five years, 1806-10, to 11,000 bales in the seven years, 1851-57. These quantities are nearly equivalent to the *total* production; seeing that nearly all the British West India cotton has been brought to Great Britain. The diminution has been attributed to several causes: the withering results of "protection," the maladministration of colonial affairs, supineness on the part of the colonists, and the scarcity of labourers since the abolition of slavery. The last is believed to be the more immediate cause of the backwardness of the culture at the present day. The free negroes will not work hard; as a class they prefer easy labour and small wages. The other labourers are Creoles, Coolies, and Portuguese. The planters are now urgently soliciting the British government for permission to import labourers from Africa, India, and China; but so strong is the apprehension of a revival of the slave-trade, as a consequence of this permission, that a disinclination at present exists to grant the necessary facilities. Demerara declares that she could increase her produce of cotton immensely, if the immigration of free labourers were allowed. Many planters strongly assert that free labour is in the end cheaper than slave labour. Lord Brougham, at the annual meeting of the British and Foreign Anti-Slavery Society, in May, 1858, said: "I find

that Mr. Governor Hinckes, writing from Barbadoes in the present year, says that there is an estate which, during the times of slavery, was worked by 230 slaves, and which was sold for 15,000*l.* Since emancipation it has been worked by 60 free labourers and 30 children; it has produced three times the quantity of sugar which it formerly did; and it was sold last year for 30,000*l.*" It is true that this relates to a sugar-plantation; but there is apparently nothing to prevent it being equally applicable to one of cotton.

The foreign West Indies do not call for much remark. Their cotton produce is comparatively insignificant.

East India Cotton.—We now come to the country which, next to the United States, attracts most attention on the part of cotton manufacturers in this country. To India they look for a relief from the commercial shackles which bind them to the United States.

Not only did the natives of India cultivate cotton in times when no such material was as at all known in England; but the amount of produce was and still is really immense. They use woven cottons, not only for clothing, but for beds, cushions, awnings, draperies, hangings, carpets, screens, curtains, tents, ropes, and numerous other articles. It is utterly impossible to say how much is grown altogether, and therefore the estimates become very wide. Dr. White, in 1848, carried it up to 3000 million lbs. annually; but Mr. Ellison, in 1858, brought it down to the more sober level of 1800 million lbs. As even the smaller of these two estimates greatly exceeds the total quantity of all kinds imported into Great Britain, the practical question arises,—Why is there not more East India cotton brought to England? The quantity has certainly largely increased, but still it bears no reasonable ratio to the increase in the United States. In 1857 it reached 250 million lbs., but in 1858 it fell to 133 millions, the decrease being due almost wholly to the disturbance occasioned by the mutiny. Even the highest of these quantities is a very small per-centage of the whole cotton produce in India. It pays to export cotton from India to China; why should it not pay still better to send it to a country where it is so urgently needed as in England? Between 1850 and 1857, the price of East India cotton at Liverpool varied from 3½*d.* to 5⅞*d.* per lb. At a time when the price ranged from 3½*d.* to 5¼*d.*, that of United States "uplands," of similar general quality, ranged from 4¾*d.* to 7¼*d.* The reason for this difference was, that the East India cotton was so dirty that 16 oz. of fibre would only yield 12 oz. of yarn; whereas an equal weight of "upland" would yield 13½ oz. of yarn. The most recent estimate of cotton supply in India is perhaps that which Dr. Forbes Watson communicated to the Society of Arts, in March, 1859: "There is reason to believe that from time immemorial the cotton plant has been grown in all parts of India, and has always afforded suitable covering for the people of that country; not only does it serve for clothing, but it answers all the several purposes for which flax, wool, hemp, and hair are employed in this country. It may be, indeed, impossible to state the exact quantity per annum thus consumed; it has been variously estimated at from 5 lb. to 20 lb. per head for the whole population. If we assume 12 lb. as likely to be near the mark, we shall find that the present population of India, calculated at 180,000,000, requires annually 2,160,000,000 lb.; and if we further adopt Dr. Royle's average of 100 lb. as the yield of native cotton per acre, we shall find that there cannot be less than 21,600,000 acres under cotton culture, exclusive of that which supplies the present export of raw cotton. These on an average of the last three years amounted to 272,000,000 lb. (including the cotton sent to China and all other places as well as to Britain); and this again divided by 100, will add about 2,700,000 acres to the former quantity. The total quantity of cotton grown in India, according to the above calculation, will consequently amount to upwards of 2,432,000,000 lb., and demand for its culture certainly not less than 24,000,000 acres."

In seeking for the causes of the limited supply to England, and of the bad reputation of East India cotton, with a view to the adoption of remedial measures, the best authorities have drawn attention to five circumstances, all of them very important. We will present the reasonings thereon in a condensed form. 1. *Careless Cultivation.* The cotton-growers of India are very poor and very ignorant. They have no capital to rest upon; no English manufacturers at hand to incite them; no good apparatus for cleaning and pressing cotton; no protection from the roguery and oppression of the native dealers, to whom they sell. Dr. Royle recommended, as a wholesome stimulus, the settlement in the cotton-districts of Europeans, or their properly instructed agents. The duty of these persons would be, to encourage the natives to grow their cotton with more care, unmixed with other and injurious crops; to teach how to pick it as cleanly as possible off the boughs; and to separate the seeds by the best machines obtainable. Or the agent might be instructed to purchase the seed cotton (in the rough state, just as picked from the bush), and clean it himself on the spot. Dr. Royle, a most competent authority, urged that a small amount of money spent in this way would be immensely beneficial, both to India and to England. 2. *Deficient Irrigation.* In the East Indies there is seldom more than 100 lbs. of cotton produced per acre, against 400 lbs. or upwards in the United States. This deficiency is mainly due to imperfect irrigation. The climate exhibits many rapid extremes of heat and cold, wet and dry; and there are few of the cotton-fields which do not suffer, either from too much or too little moisture. What is urgently needed is, draining of the wet land, and especially irrigation of the dry. There is a general opinion that the Indian government would find it profitable to execute works of irrigation, since it would greatly increase the revenue derived from land-tax—the principal fiscal resource in India. Much has been done in this direction within the last few years; and much more would have been done but for the recent excessive demands of the war-department, which have exhausted the exchequer. This interruption of useful public works is much to be regretted; for wherever irrigation works have been constructed the benefit has been great, both financially and morally. A table compiled by Colonel Cotton enumerated thirty-nine different works of irrigation which have been constructed in the Madras presidency during fourteen years, at an expense of 54,000*l.*; which have resulted in a total increase of revenue (after deducting disbursements for repairs) to the amount of 70 per cent. per annum on the original outlay. The Jumna and Ganges irrigation canals have in like manner been eminently useful. 3. *Want of Roads.* The mode of bringing the bales of cotton from the fields to the shipping ports is most tedious and expensive, owing to the deficiency in good roads and means of conveyance. Ox teams and clumsy vehicles are, at present, almost the only available means. General Briggs, in evidence given before the Cotton Supply Committee in 1848, said: "In the absence of a defined and good road, a drove of several hundred head of cattle requires to be constantly watched, and prevented from straying on the march; and this leads to the necessity of travelling by day in hot weather, when the thermometer is seldom less than 100° Fahr. These droves are seldom so few as 100, and often exceed 1000. Every morning after breakfast each ox has to be loaded, and before this operation is over the sun is already high above the horizon. The cattle have then to proceed at the slow rate of two miles an hour, and seldom perform a journey of more than eight or nine miles a day. The herd generally halts one day in seven. If the caravan is overtaken by rain, the cotton, becoming saturated with moisture, is so heavy as to prevent its transport on the cattle; and the roads, if lying through the [wet] ground, are so deep that men even sink above their ankles at every step, and cattle to their knees. It may be easily supposed that under such a calamity, the merchant and the carrier are both ruined." The mode of shipping cotton at Baroach will illustrate one stage in this very clumsy arrangement. The bales are first rolled down to the verge of the muddy shore, into which they sometimes plunge; each bale is then lifted on the shoulders of six men, who stagger up to their knees, or even up to the waist, in mud, to the boat which is to convey the cotton to the ship. Great results will follow from the present construction of main trunk lines of railway through the heart of India; but there must be good roads made from these railways to the sea, and good quays at the shipping ports, before the difficulties of transit can be overcome. 4. *Tenure of Land.* Enterprising and monied cotton-growers are deterred from speculating in India by the unsatisfactory nature of the land-tenure. The government is the sole owner of the soil. Estates are held conventionally, by a sort of tenant right. The cultivators, who we have said are poor, have little inducement to extend their operations, because they fear that any surplus would go to the government in the shape of increased land-tax; the fear may not be well-founded, but it certainly prevails to a large extent among the natives. What seems to be wanted is, the introduction of freehold, copyhold, or leasehold tenures, to give the cultivator both a pride and a profit in an improved mode of husbandry. Mr. Ellison* remarks: "If the East India Company would dispose of their lands, either in perpetuity or for long periods of time, there is no doubt that not only native but English capitalists would be found in plenty to invest their money in the same. The effect of such a proceeding would be, not only an opening up of the resources of India, but it would also cause a portion of the tide of emigration to be turned in that direction. British energy and enterprise would then take the place of Indian indifference and lassitude, and soon double the present extent of our commerce with Hindostan." 5. *Apathy of Manufacturers.* So long as the English spinners and weavers can obtain fair profits for their cotton goods, they care not whence the supply comes; and thus it has been found extremely difficult to bring them to act upon any one common plan to improve and extend the sources of supply. When, on the other hand, profits are low, the manufacturers become alarmed, and blame the government, with or without reason. Until the year 1829, the supply kept ahead of the consumption. In the next six years the demand exceeded the supply, lessening the stock in hand at Liverpool from forty weeks' consumption in 1829, to fifteen weeks' consumption in 1835. After this, owing to the encouragement afforded by high prices, the supply gained on the demand for ten years, bringing the reserve stock in 1845 up to thirty-nine weeks' consumption. Then consumption began again to get ahead of supply, and the Lancashire manufacturers were uneasy. They appealed to the East India Company, urging them to encourage the cotton cultivation in India. Sir James Hogg, on the part of the company, recapitulated what had been done, and recommended the manufacturers to send out a competent agent to the East Indies, to examine into the whole question, and see how far and in what way improvements might best be wrought.

* 'Handbook of the Cotton Trade,' 1858—the most recent and valuable work on this subject, compiled from authentic official documents, English and American. We have much pleasure in acknowledging our obligations to Mr. Ellison's volume.

What was done in this matter, we shall see presently, in connection with the Cotton Supply Association.

Egyptian Cotton.—Until about thirty years ago, Egypt produced cotton only in small quantities; but the introduction of good seed and improved methods of culture by the energetic pacha, Mohamet Ali, led to a marked advance. England first imported cotton from Egypt in 1823. In 1855, Mr. Clegg, from inquiries made at Alexandria, computed that there were 60,000,000 lbs. of cotton grown annually. England takes far more than half the produce, the next best customers being France and Austria. The small excess above the quantities so exported is worked up in the cotton mills of Egypt.

North African Cotton.—It was in the year 1850 that the French government first began to direct attention to the cultivation of cotton in Algeria. A portion of the coast was found to possess a soil and climate fitted for this plant. In 1855 there were 150 exhibitors of Algerian cotton at the Paris Industrial Exposition. In that year, about 9000 acres of land were under cotton culture. In 1856 and 1857, the produce fell off in quantity, supposed to be owing to a rush of cultivators into the trade who had neither the requisite capital nor skill. There is, however, no reason to doubt that a steady increase of produce will be exhibited in future years, even though it may never reach any important amount. Along the further portion of the African coast, towards the Atlantic, there is not at present cotton grown in a regular way for the European market; but the English manufacturers are endeavouring to encourage it, by sending good seed, and making known better modes of culture; and the sovereigns of Morocco and Tunis seem well disposed to second these endeavours.

West African Cotton.—Considering the nature of the climate and the abundance of labour at the west, or rather north-west, coast of Africa, there is every reason to think that cotton might be extensively grown in that region. Mr. Clegg, on the part of the Lancashire manufacturers, in conjunction with the Church Missionary Society, has brought this subject under the notice of the authorities at Sierra Leone, Lagos, Fernando Po, Liberia, and the interior. In the year 1852 there were 1810 lbs. of cotton brought to Liverpool from that region; it gradually rose, until the first four months of 1858 exhibited an import of 96,000 lbs. Mr. Clegg's own account of his operations, communicated to the Society of Arts in December, 1858, is full of interest: "Some ten years ago, seeing the importance of the subject, he thought he would, as an individual, see if he could not get cotton from somewhere else than America. He turned his attention to Africa; and he asked the Church Missionary Society, of which he was a member, to select for him suitable agents, to whom he could entrust money for the purchase of cotton from the African natives. He made arrangements always to have money on the spot, in the hands of the agents; and his instructions were, that they should purchase the cotton of the natives in however small parcels it might be brought to them; if only half a pound had been plucked from the plants, they were to buy it. The consequence was, that in a short time the women brought small quantities of cotton to the stations: this was communicated to their neighbours; and in a little while afterwards seed was planted, and the cotton growth became more and more plentiful. He sent out a number of cotton gins, which the natives soon learned to use. He also erected a store, and placed a large number of gins in it. The natives brought the cotton in pods and in seed, and they learned to clean it; and after using a gin sufficiently long to pay the expense of it, they shouldered the implement and carried it off as their own property, to be used hereafter in dressing the cotton they brought for sale. He had introduced three young African natives into his mill at Manchester, where they had been taught the use of machinery generally; and they had been sent back to their own country, to carry out the preparation of cotton upon a larger scale." Mr. Clegg estimates that West African cotton can be sold at Liverpool for $4\frac{1}{4}d.$ per lb., made up thus:—

	d.
4 lb. of cotton in the seed, at $\frac{1}{2}d.$	2
Cleaning it into 1 lb. of good fibre	$\frac{1}{4}$
Packing and canvas	$\frac{1}{2}$
Carriage to port and shipping	$\frac{1}{4}$
Freight to England	1
Charges at Liverpool	$\frac{1}{4}$
	$4\frac{1}{4}$

If the cotton were of fairly good quality, and moderately clean, it would meet with eager purchasers at anything near this price.

South African Cotton.—Whether the region around the Cape of Good Hope could produce cotton of a quality and price that would compete with that of America in the English market, is a problem not yet answered; there is not at present an organisation sufficient for ensuring a due and steady supply of labour. Attention is, however, at present directed to a part of Africa north of the Cape, scarcely known to Europe until Dr. Livingstone visited it. This skilful and energetic traveller, in passing through the country of Angola, saw the native women spinning cotton with spindle and distaff. "The cotton was brought to the market for sale, and I bought a pound for a penny; this was the price demanded, and probably double what they ask from each other. We saw cotton growing luxuriantly all around the market-place from seed dropped accidentally. This is seen also about the native huts; and so far as I could learn, it was the American cotton so influenced as to be perennial." He found an abundance of willing labourers; but no roads from the cotton-fields to the sea-coast. "I found the people were anxious to engage in commerce with us; but they had no roads, nor pathways down to the coast; and although 100,000*l.* worth was annually exported in ivory, bees'-wax, and palm-oil, yet every ounce thus procured was taken down to the coast on the heads and shoulders of men." M. Canto, Portuguese commandant of Gelanjo Alto, on one occasion said to Livingstone, "If I had possession of a few hundred pounds, I would create a complete revolution in the commerce of this country; I would purchase all the cotton now produced, and certainly next year they would produce much more; and then the third year I could make myself rich with a few hundred pounds." When Dr. Livingstone returned to Africa in 1858, he took with him a few bushels of very fine cotton seed, to encourage the natives to grow cotton fitted for the English market, hoping that roads and other facilities would gradually be obtained. In a debate in the House of Commons on the Slave Trade, on July 12th, 1858, Lord Palmerston expressed himself thus strongly: "I venture to say that your commerce with the (south) western coast of Africa in the article of cotton will, in a few years, prove to be far more valuable than that of any other portion of the world—the United States alone excepted."

Miscellaneous Cotton Districts.—All the remaining cotton-growing districts may be passed over briefly. *Asiatic Turkey* used formerly to be a great source of supply for England; but the portion furnished has now become very small—partly because the inhabitants of Asia Minor and Syria have introduced the cotton manufactures among themselves, and partly because the portion exported goes to France rather than to England. It is believed that, so far as natural capabilities are concerned, the produce in Western Asia might be immense; but to develope this produce would require irrigation, good seed, capital, energy, and skill. *Spain* and *Italy* grow a little cotton, but it is too little to need attention here. *Australia* has been examined in certain places, with a view to ascertain whether the soil and climate are suited for cotton culture. There is a district, measuring about 300 miles by 100, near Moreton Bay, which is believed to possess many of the requisite qualities; but the scarcity of cheap labour is at present an insuperable difficulty.

To what extent the several countries of the world *consume* the cotton thus grown, is a subject treated in a separate article [COTTON TRADE AND CONSUMPTION]; we have here purposely confined our attention almost exclusively to growth and supply.

(*First and Second Annual Reports of the Cotton Supply Association*, 1858 and 1859; Ellison, *Handbook of the Cotton Trade*, 1858; Royle, *Culture of Cotton in India*; Mackay, *Reports of Cotton Culture in Western India*; Livingstone's *Travels in Africa*; *Jury Reports on the Great Exhibitions of London and Paris in* 1851 *and* 1855; M'Culloch's *Commercial Dictionary*, last edition; *Liverpool and Manchester Trade Circulars*; *New York and New Orleans Trade Circulars*; Baynes' and Bazley's *Lectures on the Cotton Manufactures*; *Consular Reports on the Trade of Foreign Countries*; *Board of Trade Tables*: *Parliamentary Papers*; *United States' Statistical Tables.*)