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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

G.O. No.	105	Press
B.P. No.		Mis.

Dated 25-1-1876 196 .

Not to be folded or roughly handled

No. 211. Read the following letter from R. KNIGHT, Esq., Calcutta, to the Secretary to the Government of Madras, Revenue Department, dated Calcutta, 11th December 1875 :—

I have the honor to submit the Prospectus of the new journal I purpose publishing on the 1st of January,—*The Indian Agriculturist*,—in the hope that the Government of Madras will assist me, as it did with the *Indian Economist*, in its establishment.

2. Since the discontinuance of the *Agricultural Gazette of India*, there is no purely agricultural paper in the country, while its industry is almost wholly so, and my purpose is to make the *Indian Agriculturist* a complete record of everything that is being done or attempted for the improvement of the husbandry of the people and for the ascertainment and development their mineral resources.

3. In the present low state of education amongst the people there is very little inquiry for such information, and I am, therefore, obliged to look to Government for such assistance as will justify my undertaking the work, which I purpose should meet the need of any official publication of that could be produced only at many times the cost, and which, as long experience has shown, would still never awaken enough public interest for its success.

4. I have fixed the subscription at Rs. 12 per annum, in the hope that a few years a sufficiently large number of private subscribers may be attracted to the journal, to make it independent of Government aid altogether.

5. As the first number of the paper will appear on the 1st of January, I shall esteem it a favor if you will kindly let me early as to what support the Government of Madras will give to my undertaking.

6. I may mention that several of the minor Administrations of the country are subscribing largely to the paper; Punjab Government taking 50 copies, Assam 20, Burmah 30, Mysore 24, and Oudh 2 copies.

No. 212. Order thereon, 25th January 1876, No. 105.

Miscellaneous.

The Government will take ten copies. The Board of Revenue will be requested to supply the Editor with Statistics of Trade and other similar returns. Government orders on agriculture, &c., will be sent direct from this Office.

(True extract.)

(Signed) D. F. CARMICHAEL,
Secretary to Government.

To R. Knight, Esq.
„ the Board of Revenue.

THE

INDIAN AGRICULTURIST.

A MONTHLY

JOURNAL OF INDIAN AGRICULTURE, MINERALOGY AND STATISTICS.

VOL. I.] CALCUTTA: SATURDAY, 1st JANUARY 1876. [No. 1

ADVERTISEMENTS.

THE STANDARD

LIFE ASSURANCE COMPANY

has placed on its books New Assurances to the amount of £1,500,000 every year since 1865—a result maintained by no other office in the United Kingdom for so many successive years—some of them years of doubt and anxiety in the Assurance World.

THE INVESTED FUNDS of the Company have increased from £2,000,000, in 1865, to £4,621,000, in 1875, and now amount to nearly

FIVE CRORES OF RUPEES.

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GEORGE LUCAS KEMP,
Secretary, Calcutta Branch.

STANDARD LIFE Offices,
Calcutta, 20th October 1875.

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Argyle Table Lamps.

With very handsome Opaque Reflectors, Bronzed.

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Table, Reading, Bracket, Hanging and Billiard Bronzed, Bronzed and Relieved, Glass, Porcelain and Electro-Silver Fluted, and Bronzed and Lacquered Reservoirs.

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Bronzed, Porcelain, Opaque and Glass Pillars.

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are sold in their packets by the principal Nurserymen in India, Australia, Ceylon, and Continental Societies' Gardens, and have proved themselves the best for the Indian climate.

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From W. NEW, Esq., Government Gardens, Bangalore, India.

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SEEDS PACKED FOR ALL PARTS OF THE WORLD.
SUTTONS
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MARSHALL, SONS, & CO. (LIMITED),
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Patent Engines, and Manufacturers of
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MEDAL FOR PROGRESS AND MEDAL FOR MERIT, Vienna Universal Exhibition, 1873.
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LONDON, ANTWERP, HAVRE AND EMBRICH ON RHINE.
GUARANTEED TO CONTAIN
Nitrogen equal to 10 per cent. of Volatile Ammonia.
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Price £24 per ton for 20 tons and upwards.
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Delivered Free at any of their Depots in the United Kingdom.
Terms—Cash.

THIS Manure is prepared from Selected Peruvian Government Guano. The result of its special treatment is, that the Ammonia is fixed, the Phosphates in the Best Organic condition soluble, and the Mineral Properties like the condition of a fine dry powder.
It is offered to the Farmer in the confidence that the above Analysis will be found correct, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.
Pamphlets containing Testimonials, Analysis, &c., sent on application.
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Tapioca.

Dissolved Peruvian Government Guano will give the finest crops of cassada or tapioca root ever grown. Its effects on the Plant are immediate, and the root will be ready about the end of the season of the ordinary manure.

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Dissolved Peruvian Government Guano will produce a large and prolific crop of arrowroot, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

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A Peruvian acre of Government Guano will produce a large and prolific crop of rice, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

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A Peruvian acre of Government Guano will produce a large and prolific crop of sugar, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Cotton.

A Peruvian acre of Government Guano will produce a large and prolific crop of cotton, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Coffee.

A Peruvian acre of Government Guano will produce a large and prolific crop of coffee, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Tobacco.

A Peruvian acre of Government Guano will produce a large and prolific crop of tobacco, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Indigo.

A Peruvian acre of Government Guano will produce a large and prolific crop of indigo, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Maize.

A Peruvian acre of Government Guano will produce a large and prolific crop of maize, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Wheat.

A Peruvian acre of Government Guano will produce a large and prolific crop of wheat, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Barley.

A Peruvian acre of Government Guano will produce a large and prolific crop of barley, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Oats.

A Peruvian acre of Government Guano will produce a large and prolific crop of oats, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Potatoes.

A Peruvian acre of Government Guano will produce a large and prolific crop of potatoes, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Turnips.

A Peruvian acre of Government Guano will produce a large and prolific crop of turnips, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Mangel Wurzel.

A Peruvian acre of Government Guano will produce a large and prolific crop of mangel wurzel, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Carrots.

A Peruvian acre of Government Guano will produce a large and prolific crop of carrots, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Parsnips.

A Peruvian acre of Government Guano will produce a large and prolific crop of parsnips, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Cabbages.

A Peruvian acre of Government Guano will produce a large and prolific crop of cabbages, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Kohl Rabi.

A Peruvian acre of Government Guano will produce a large and prolific crop of kohl rabi, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Clover.

A Peruvian acre of Government Guano will produce a large and prolific crop of clover, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Grass.

A Peruvian acre of Government Guano will produce a large and prolific crop of grass, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Lucerne.

A Peruvian acre of Government Guano will produce a large and prolific crop of lucerne, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Sainfoin.

A Peruvian acre of Government Guano will produce a large and prolific crop of sainfoin, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Vetches.

A Peruvian acre of Government Guano will produce a large and prolific crop of vetches, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Beans.

A Peruvian acre of Government Guano will produce a large and prolific crop of beans, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Peas.

A Peruvian acre of Government Guano will produce a large and prolific crop of peas, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Lentils.

A Peruvian acre of Government Guano will produce a large and prolific crop of lentils, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Chickpeas.

A Peruvian acre of Government Guano will produce a large and prolific crop of chickpeas, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Horsebeans.

A Peruvian acre of Government Guano will produce a large and prolific crop of horsebeans, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Soybeans.

A Peruvian acre of Government Guano will produce a large and prolific crop of soybeans, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Groundnuts.

A Peruvian acre of Government Guano will produce a large and prolific crop of groundnuts, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Linseed.

A Peruvian acre of Government Guano will produce a large and prolific crop of linseed, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Rapeseed.

A Peruvian acre of Government Guano will produce a large and prolific crop of rapeseed, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Mustard.

A Peruvian acre of Government Guano will produce a large and prolific crop of mustard, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Poppy.

A Peruvian acre of Government Guano will produce a large and prolific crop of poppy, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Hemp.

A Peruvian acre of Government Guano will produce a large and prolific crop of hemp, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Flax.

A Peruvian acre of Government Guano will produce a large and prolific crop of flax, of the finest quality, and considering the quality, Price, and Guarantee, it is the cheapest Artificial Manure in the market.

Jute.

A Peruvian acre of Government Guano will produce a large and prolific crop of jute

Is there no Indian wood that would serve as a substitute for boxwood in the engraver's hand? The demand for box has become so heavy, while the supply is so limited and the growth so restricted, that it is well worth researching our Indian forests for some substitute. There are many very close-grained, easy-passing woods in the country that it seems for the most work ought to answer the purpose as well as box. In Burma they use *Xylia dolabriformis* as a substitute, and there are woods nailed for the purpose greatly to be found in India. The experiment has been tried on anything of anatomically basic homogeneity and quality, while the fineness of engraving is the severest test to which wood can be subjected. Old blocks that have long been stereotyped and have been replaced for years, that may have escaped the notice of former generations, might thus be recovered by many a happy thought for a high price in England. The object in this notice is to call attention and the Government forests of the country be prohibited, and without exception all the boxwood in obtained for the trade in this wood, many substitutes have been resorted to by engravers, but hitherto no wood, metal, or composition has been discovered that possessed all the required qualities. During 1874, 1,000 tons of boxwood were shipped from the Caucasus. Seventy Persian carriers were shipped from thence in small vessels to Astrakan at the mouth of the Volga, where they transferred to the Don, and down that river to Rostoff, for shipment to England.

During last week it is remarkable of great importance in the Punjab & Rajputana. We hardly suspect however been gone with the supply of the season, the small extent of cultivation in the country, the abundance of the late rains in October, and the general prosperity of the people. There are no returns in this country, and the area is roughly estimated by the Settlement Officers in their reports, and the figures are often treated as the result of pure guesswork. Still the returns that have long been accustomed to, former seasons, while would thus be governed by more exact data than are usually available for a high price in England. The object in this notice is to call attention to

division 1,599 pieces of timber were brought to the depot and about half of these disposed of by auction or private sale; Rs. 5,974 being realized in this division for timber coming by river or railway. The stock in hand in this division at the close of the year amounted to 16,998 pieces. On the whole it may be said that Dr. Schlich has established a system of forest conservancy of which promises to the Chittagong and Darjeeling divisions which promise well for the future.

The Indian Agriculturist.

CALCUTTA, 1st JANUARY, 1876.

OUR FIBRES.

JUTE is at present by far the most important vegetable fibre of India; there are at least thirteen different species of the plant in the province, belonging to eight different natural orders, viz:—

Malvaceæ.	*Euphorbiaceæ.*
Urena lobata.	*Urena Meyenniana.*
Abutilon asiaticum.	*Jatropha curcas.*
Sida rhombifolia.	*Ricinus communis.*
Sida cordifolia.	*Croton Tiglium.*
Pavonia odorata.	*Croton oblongifolius.*
Hibiscus cannabinus.	*Croton sebiferum.*
Hibiscus sabdariffa.	*Excœcaria Agallocha.*
Hibiscus Abelmoschus.	*Euphorbia antiquorum.*
Gossypium herbaceum.	*Euphorbia neriifolia.*
Gossypium arboreum.	*Euphorbia tirucalli.*
Bombax malabaricum.	*Euphorbia Caducifolia.*
Eriodendron anfractuosum.	*Euphorbia antiquorum.*
Sterculiaceæ.	*Euphorbia nivulia.*
Sterculia villosa.	*Euphorbia Royleana.*
Sterculia urens.	*Euphorbia Roxburghiana.*
Sterculia colorata.	*Euphorbia Antiquorum.*
Sterculia guttata.	*Euphorbia Nivulia.*
Sterculia fœtida.	*Euphorbia Royleana.*
Sterculia alata.	*Euphorbia Roxburghiana.*
Sterculia Balanghas.	*Euphorbia Caducifolia.*
Sterculia Tragacantha.	*Euphorbia Tirucalli.*
Sterculia Roxburghii.	*Euphorbia Neriifolia.*
Sterculia Wallichii.	*Euphorbia Caducifolia.*
Sterculia Caudata.	*Euphorbia Tirucalli.*
Sterculia Caudata.	*Euphorbia Neriifolia.*
*Sterculia Caudata

nation that the greatest mortality occurs. Possibly so, but it is more frequently so, then not, and to single out instances with statistics destructive at the best to advance theory, in overthrowing well-known and admitted facts is hardly the way we think to treat such important an enquiry.

SEED AND SEED-SOWING.

THE over-stocked even of a really good candy is one of the features of confectionery in the designs inspired for raising a crop, and yet, small as the margin is in the new cultivation that do not grudge the expense. The willow may seed promising fine ordinary character, but one of the subject of every crop with a practical planter is everything have to diversify, may prevent, or somehow to make a low land. Then to have only pressed one hand of the most per cent. Next will test the value of the tubular or cultivation, the loss of the crop, or the difference in the success of some may be very considerable by good seed and from a crop produced by bad seed may be 20 per cent in favour of the former, say 15 per cent, certainly a large reason for the extra labour spent in procuring the good seed.

The true reason is not so, for the sickly crop produced by inferior seed or by old seed is always much liable to be injured by weather, and by insects than a healthy crop, the produce of well-matured seed. By good seed, we mean not only that the seed must be large and well formed, free by its kind, ripen to colour, dead and free from all foreign matter, but that it must have been produced under favourable circumstances, that is, it must have been produced under favourable conditions of soil and climate, and must not be a seed grown year after year, sowing the produce of their own soil. They are not unfrequently to obtain seed by exchange or by purchase from some distance, with a view of a different kind to that formed by them, or what is even better, obtain a favourable variation of the kind cultivated, which is sometimes the result of a change of soil or climate. Occasionally good seed may be had in the country, but it is rare that the cultivator can depend upon it, and he is generally obliged to send to a distance for it. Unfortunately good seed is not to be procured from the native bazaars. The natives do not appear to understand the advantage of procuring seed from a distance, and the seed sold in the bazaars is generally of the worst description, and is often adulterated with the seeds of weeds. Even the native cultivators seem to be aware of the fact that seed from a distance is better than that grown on the spot, for they frequently import seed from a distance, but they appear to be unable to distinguish between good and bad seed, and the seed they import is generally of the worst description. Instances have come under our notice where the seed imported by natives has been found to be entirely composed of the seeds of weeds, and the crop produced from it was a complete failure. Good seed can only be obtained from a respectable seedsman, and the cultivator must be prepared to pay a fair price for it. Cheap seed is generally bad seed, and the cultivator who buys it will find that he has been deceived to his cost.

The seeds of most farm crops usually germinate in from 4 to 10 days, but under unfavourable circumstances of soil or weather they frequently remain dormant for a much longer period. Seeds of grass and pulse frequently remain in the ground for a year or more before germinating, and the seeds of many weeds will remain dormant for a number of years. Hence the importance of not ploughing in the seed of weeds with the crop, and of not sowing seed on land which has been recently manured with farm-yard manure, as the seeds of weeds are frequently present in large numbers in such manure. Deep ploughing is also necessary to prevent the seeds of weeds which have been buried for a number of years from being brought to the surface. Many seeds will not germinate if they are buried too deeply in the soil, and the depth at which they should be sown depends upon the size of the seed, the nature of the soil, and the season of the year. Small seeds should be sown near the surface, and large seeds deeper in the soil. Seeds sown in the spring should be buried deeper than those sown in the autumn, as the soil is generally moister in the autumn than in the spring. Seeds sown in light soils should be buried deeper than those sown in heavy soils, as the latter are liable to bake on the surface, and thus prevent the young plants from coming through. Seeds sown in dry weather should be buried deeper than those sown in moist weather, as the soil is generally moister at a depth of a few inches than on the surface. Seeds should be sown at a depth sufficient to cover them with moist soil, but not deep enough to prevent the young plants from coming through. Many seeds germinate more quickly if soaked in water for a few hours before sowing, and this is especially the case with the seeds of leguminous plants. Seeds should be sown when the soil is in a proper condition to receive them, and not when it is too wet or too dry. Many seeds germinate more quickly if sown when the soil is moist than when it is dry, and the seeds of many plants will not germinate at all if sown when the soil is too dry. Seeds should be sown when the soil is in a proper condition to receive them, and not when it is too wet or too dry. Many seeds germinate more quickly if sown when the soil is moist than when it is dry, and the seeds of many plants will not germinate at all if sown when the soil is too dry. Seeds should be sown when the soil is in a proper condition to receive them, and not when it is too wet or too dry. Many seeds germinate more quickly if sown when the soil is moist than when it is dry, and the seeds of many plants will not germinate at all if sown when the soil is too dry.

the seed is placed irregularly in the soil, and there is always a considerable waste from seed being left uncovered, or by being covered too deeply. Hence to provide against a deficiency of plant from this cause, it is necessary to sow a little more seed than would otherwise be needed. Thick sowings on rich or highly manured soil, produce a close luxuriant growth of prematurely developed plants, which generally become matted and laid low before harvest. Crops in this state are invariably attacked by mildew, under the influence of which their yield is greatly lessened. In rich and poor soils alike, thin sowing is beneficial, not too thin on poor soil, though on very highly manured soils, seed can scarcely be too thinly sown. The desideratum is to produce a good standing regular crop through which air and light may get. As a rule, thick-sown crops require an abundant supply of manure to enable them to perfect their development. The resources for support must be especially provided for, if the soil is not in a high manural condition. But rules cannot be laid down for all conditions of soil, of crops, of climate, &c., each farmer should experiment and ascertain for himself, what quantity of seed of each variety best suits his soil and climate.

FORESTS.

FOREST TREES FOR BENGAL.

A CORRESPONDENT writing to the *Englishman* says that the *Ajhar* (*Terminalia tomentosa*), or *asan*, is one of the finest forest trees of the West Indian and Equatorial regions of South America. Its size is frequently colossal, and the timber exceedingly valuable for cabinet making, but hidden and rather coarse in the grain, much sought after by carpenters. It is classed among the "hard wood" and sinks when set on end in water. The fruit, however, does not quite come up to your correspondent's description as much of food, although eaten by squirrels and monkeys, and occasionally by natives of schoolboys. The "Aigrowa" flowers on the sides of hills in dry seasons on clays, but is rarely met with in the plains. A fine specimen of this species grows on the writer's property, and attained a height of about forty feet, and a circumference of fourteen feet above the ground. The branches of this splendid tree shoot out laterally from the point where at a height of thirty or forty exceeding into a very close, dark green foliage (as represented in the sketch).

The next best suited for the hilly plains of Bengal are the "Carpa" and "Murta" or "Mark." The former is useful as a shade tree, while the bark supplies a fibre used for making gunny bags, and is generally considered a valuable tree. The "Murta" (*Cedrela toona*) thrives in rich moist deep forest soils, attaining a vast size. Its timber being largely used for packing cases, &c., would be a considerable item in the forest revenue. The "Mark" (*Cedrela serrata*) is a very handsome tree, and is found in the Sikkim Himalayas, ascending to 6,000 feet. It is a large

with a pendicle, and in doing so found the material rather tough; and likewise made that with all the Indian something might be done with the raw material. About the same period some of the coconuts were taken to Australia, but how they succeeded I cannot say, as I have no correspondence with the colony. May say I think it would be a good speculation for some capitalist with enterprise to have a try at the experiment of making this enterprising Australian colony regularly prosper, and no I need not state India ought to be had in remembrance.

A TRAVELLER.

RICE.

Forests, swamps and numerous varieties of the rice plant are extensively raised or harvested, that may be set aside for various purposes, prevailing into

[illegible]

Mr. Hall is to address to you from the south. There are several patent processes now in use for the manufacture of rice-starch, which is largely used for [illegible] purposes.

Since the cultivation of rice in the Carolinas, there has been a very considerable [illegible] in the manufacture of rice, and the [illegible] of rice grown in the United States during the year 1860 was, according to the census returns, estimated at 270,000,000 lbs., or over 96,000 tons, of which [illegible] were raised in South Carolina alone. However, since the [illegible] the crops seem to have considerably diminished, and in 1866 the crop of rice exported from the United States only [illegible] to 61,000 tierces. The exports of rice from India during the [illegible] years average from those to Great Britain of upwards [illegible] tons, of which [illegible] is supplied principally from Bengal. [illegible] were exported from Burma and Pegu. The exports of rice into the United Kingdom in 1870 amounted to 677,776 cwts. [illegible] of 1,943 quarters; South Carolina [illegible] at least thirty-five shillings [illegible] Dollars [illegible] and from fourteen to twenty [illegible] February 7, 1849 the price of Patna rice was as high as [illegible] shillings per cwt., whilst at the same time it [illegible] from a Burma [illegible] rice was [illegible] In 1852 the [illegible] reduced the [illegible] to 3d., and the duties [illegible] the [illegible] the duty [illegible] to 1d. In 1860 the [illegible] and the duties [illegible] were, and in 1862 they were abolished altogether.

The Editor.

[illegible] ordinary grain, it occupies us here, who rarely give it a thought, to be [illegible] of the [illegible] the Hindu, the word rice conveys little [illegible] to [illegible] rather than [illegible] grain, even to the [illegible] of this [illegible] to [illegible] [illegible] [illegible]

The number of bales got pressed in Bombay last fall is from 7 lakhs to 1,000,000. The correspondence this summer of half-a-dozen has ranged from 12 to 13½, and four full presses have been erected in Bombay. The final number of full presses may be double, namely, 8 to 11 against 4 last year. But there are also a number of presses in Broach and Surat.

Some interesting experiments on cotton—the silos were ready on account of Mr. Mollett's arrival. The maps are of large districts of the Bombay Presidency and central provinces, and are finished. From experiments it is inferred that experiments are proved that American cotton can be grown by the Ryots, but that it cannot be grown as a staple to compete in Liverpool with American cotton. Experiments are continuing in the Dharwar district, where American cotton is being grown by the Ryots. The experiments are also being carried on in Khandesh, Dharwar, Ahmednuggur, Poona, Sholapur, Belgaum, Kaladgi, Broach, Surat, Nadiad, Ahmedabad, Kaira, Sirsa, Hansi, Hissar, Rohtuck, Delhi, Umballa, Ferozepore, Lahore, Amritsar, Gurdaspur, Sealkote, Jullundur, Hoshiarpur, Ludhiana, Firozepore, Umballa, Delhi, Rohtuck, Hissar, Sirsa, Hansi, Sealkote, Gurdaspur, Lahore, Amritsar

grains earlier the cold season as any rule sets in, though one result of [illegible]

Since the beginning of this experiment no distribution of plants has been made with the exception of a few lots to the Nilgiri Hills, the Andamans and Madras. Two hundred are now in progress to be sent to Burmah and Ceylon.

JAGUTTHOUCC, BENGAL.

From the Secretary, Corporation of Fowlis, Bengal, to the Secretary to Government of Bengal, Agricultural Department, Calcutta, dated the 8th May 1871.

In 1870 seven experimental plantations were established—one at Jaulia, Assam, and one at Dumdumpore, in the Darjeeling district. These plantations were laid out and treated on ingenuity system in your letter No. 1666 dated 21st May 1870. The system being that proposed by the Hon'ble Mr. Grant, Commissioner of Darjeeling, I conferred the latter gentleman, who will be better able to explain the circumstances connected therewith than myself. Mr. Grant, however, has requested me to state that the cuttings were planted 4 feet apart each way, and that the soil was well manured with cow-dung. The cuttings were planted in the month of July 1870, and the plants were cut down to within 6 inches of the ground in January 1871. In each case the latter being 6 feet apart, or 1,815 per acre. The cuttings had to be brought from Siroke, as a distance of about 70 miles, and the sets put into the ground immediately on arrival. In this way 14 acres were planted, containing 5,700 cuttings, and as they grew rapidly so that by the end of March 1871 were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of October, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of January 1872, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of March 1872, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of October 1872, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of January 1873, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of March 1873, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of October 1873, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of January 1874, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of March 1874, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of October 1874, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of January 1875, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of March 1875, when they were cut down to within 6 inches of the ground. The plants were then allowed to grow until the end of October 1875, when they were cut down to within 6 inches of the ground.

[illegible]

[illegible]

[illegible]

as much as manure proves to be its food. An occasional dressing with liquid manure is very beneficial. Bed cabbage seed should be sown in September, either on a sheltered piece of ground, or in the open air, on a raised bed that can be sheltered, when required from wet and rain. They may be planted out and grown as other cabbages, with this exception, that as they require less water, as it fills the veins with too much liquid they require less water, as it fills the veins with too much liquid they require less water, as it fills the veins with too much liquid

Therefore these three analyses may not represent the average of what we know of the gravel of the alluvial gold in Wynaad, and given in the low country shown on the map (p. 13)—viz., 88·10 and 92·12 is quite right. But there are some other varieties of native gold than that which has been able to withstand 20 per cent. of alloy. Of the specimens now before me, for instance, one from Nos. 1 of the present series of localities, viz., Nos. 2 to 5 from one part of the district, Nos. 6 to 8 from another part, and Nos. 9 to 11 from the extreme south-east corner of the district, Nos. 12 to 14 from the Malabar low country, and Nos. 15 to 17 from the Nilgiris, I have selected 17 specimens, which I have numbered in the order of their fineness, and which I have arranged in the following table, in which the first column gives the number of the specimen, the second the fineness, and the third the number of the locality from which it was obtained:—

No.	Fineness.	No. of locality.
1	1000	14
2	1000	14
3	1000	14
4	1000	14
5	1000	14
6	1000	14
7	1000	14
8	1000	14
9	1000	14
10	1000	14
11	1000	14
12	1000	14
13	1000	14
14	1000	14
15	1000	14
16	1000	14
17	1000	14

Of these 17 specimens, 14 are of the purest gold, and 3 are of gold containing a trifling admixture of silver. Of the 14 specimens of pure gold, 11 are from the alluvial gravel of Wynaad, and 3 are from the gravel of the Malabar low country. Of the 3 specimens containing a trifling admixture of silver, 2 are from the alluvial gravel of Wynaad, and 1 from the gravel of the Malabar low country. Of the 11 specimens of pure gold from the alluvial gravel of Wynaad, 3 are from the extreme south-east corner of the district, Nos. 9 to 11, and 8 are from other parts of the district, Nos. 1 to 8. Of the 3 specimens of pure gold from the Malabar low country, 2 are from the extreme south-east corner of the district, Nos. 12 and 13, and 1 is from the extreme north-west corner of the district, No. 14. Of the 3 specimens containing a trifling admixture of silver, 2 are from the alluvial gravel of Wynaad, and 1 from the gravel of the Malabar low country. Of the 2 specimens from the alluvial gravel of Wynaad containing a trifling admixture of silver, 1 is from the extreme south-east corner of the district, No. 11, and 1 is from the extreme north-west corner of the district, No. 8. Of the 1 specimen from the Malabar low country containing a trifling admixture of silver, 1 is from the extreme south-east corner of the district, No. 13. Of the 3 specimens from the extreme south-east corner of the district, Nos. 9 to 11, 2 are pure gold, and 1 contains a trifling admixture of silver. Of the 8 specimens from other parts of the district, Nos. 1 to 8, 7 are pure gold, and 1 contains a trifling admixture of silver. Of the 3 specimens from the Malabar low country, 2 are pure gold, and 1 contains a trifling admixture of silver. Of the 3 specimens from the Nilgiris, Nos. 15 to 17, all are pure gold.

20. Among the localities named above, the chief seat, about to be taken by the Alpha Company, was tried more especially by seven pits (Nos. 2 and 3, shaded), from three of which, the two at the head of the gravel-bed, and the third from the lower end, through the peat, the following results were obtained:—

No. of pit.	Depth of gravel.	Value of gold per load.
	Feet.	Rs. A. P.
2	2	0 12 0
2	3	0 12 0
2	4	0 12 0
2	5	0 12 0
2

publication. The principle propounded in Mr Howard's paper may be illustrated by the peculiarities of cinchona. From the account of a great natural species of cinchona still existing amidst the Andes, that in young days they would have been founded into new species. But from each of 21 *species* we can raise vast varieties of *succirubra*, almost hybridisation, we will say, *officinalis*. The latter plan seems to have happened at Calcutta in the case of *officinalis* and *C. officinalis* seeds from Ceylon, where will make varieties more or less valuable, but never widely they may differ in appearance, the leaves being smooth or hairy, narrow or wide, the colour of the young shoots, the flowers, the seeds, &c. Hybridisation may also be the cause of the great variations in the quality of the bark of trees raised from seed gathered on the same estate in Ceylon, where all the trees are probably descended from the same original stock. Mr Howard's paper is full of interesting facts, and I hope he will continue his observations on the subject.

Mr Howard's paper naturally raises the question, what is a species? Botanists generally define species as groups of individuals descended from common parents, or which resemble each other so much that they may be supposed to have had such parents. But neither of these definitions is satisfactory, for we rarely have the means of ascertaining the parentage of individuals, and the resemblance between species is often greater than that between individuals of the same species. Species, in fact, are merely groups of individuals which we find it convenient to distinguish from each other for the purposes of study or description. Species are not fixed and unalterable, but are constantly undergoing slight changes, which, in the course of many generations, result in the formation of new species. Varieties are groups of individuals differing from each other in certain characters, but not sufficiently to rank as species. Varieties are produced by the action of various causes, such as climate, soil, food, &c., and are generally found in a wild state only when the species to which they belong has a very wide range. Species, on the other hand, are usually restricted to comparatively small areas, and are often found only in one locality. Varieties are also produced by cultivation, and many of our most valuable fruits, flowers, and vegetables have originated in this way. Varieties, when left to themselves, generally revert to the original type, and this is the case with cultivated varieties of cinchona when planted out in the forest. Species, on the other hand, are permanent, and do not change when transplanted from one locality to another. Species are also distinguished from varieties by the fact that they will not breed freely together when crossed, while varieties will. Species are also generally more distinctly defined than varieties, and have a greater number of points of difference. Species, however, are not always distinct, and botanists frequently disagree as to whether certain forms should be ranked as species or varieties. Species are sometimes connected by intermediate forms, which are called varieties, and sometimes by hybrids, which are the result of a cross between two species. Species are also sometimes connected by varieties which have arisen from a cross between two species. Species are also sometimes connected by varieties which have arisen from a cross between two species. Species are also sometimes connected by varieties which have arisen from a cross between two species.

the valuable plant. In the earlier portion of his paper, Mr. Howard, after having made favourable mention of works by Dr. Weddell and Mr. Tetens, the latter a native of one of the richest cinchona-growing districts of South America, went on to say:—

I believe that the number of real species of cinchona is very much limited than is supposed—and that between these species there exist a very large number of intermediate forms, which ought not to be considered as so many different species, inasmuch as extreme inconveniences would thereby be caused, even if botanical distinctions existed between them.

In the conclusion of this paper I expressed "my opinion that every well-defined region of the Andes has its own prevailing and characteristic species, generally found in various spaces and *incapable of being reckoned by any one typical form*. I do not think that any species has been clearly proved to prevail unchanged from end to end of the cinchonaceous region, and I believe the plants which resemble each other in distant parts will be found analogous rather than identical."

I am confirmed in the correctness of this view of the matter both by seven years' additional observation, and by the testimony contained in the correspondence from those who could observe on the spot. But it proves to be much too hastily sanctioned on subsequent classification. Many so-called typical species will have to resign such positions, and to be classed as well-defined *forms* (varieties or, rather rarely?) and the whole arrangement will become more natural and less artificial.

I must be pardoned for observing that I have not yet any evidence to show that the *C. succirubra* really merits the dignity of a sub-species; nor that I saw that the *C. angustifolia* in any other than an accidental variety would be one in those attributes of permanency which would be necessary to constitute it a species. This seems to be the opinion of Mr Mc Ivor. I must suppose the specimens from India two or more varieties, between understood which confirms me in this way of looking at the matter.

It appears, then, to have been an unfortunate time which induced the early botanical labourers in our field to name many of the species after the shape of the leaves, as *condiflia, lancifolia*, &c., since even on the same plant may be found as almost much diversity.

I have to express my regret that the cultivation of this red bark has been so widely extended. *It is not to my taste of becoming the universal medicine of the future.* I have ascribed its unpopularity to my *Cinchona of the Neilgherry Plantations* and find by a recent letter from Mr. Broughton that I am right in my supposition. Neither will the plan of devoting one branches with enough for part of supplies of the bark, will prevent its being used to the detriment of the more valuable Cinchonas.

This does not diminish the value of this bark for the preparation of drugs (as distinguished from the *cinchona-alkaloid*). Here, as a second point of view is to be taken in this particular class, as to the quantity produced by different trees that an acre could be found for the quantity that could be prepared; natural, indeed, the Indian Government could be induced to encourage cinchona-culture for part of their supplies of quinine, or the same course of action were followed by other nations, the Government of India have already rendered an essential service to mankind. Let the commission which they appointed to test the relative value of the different varieties. It would seem that every species requires a commission to ascertain the particulars of that species which the peculiarities of India may now so abundantly produce.

The general conclusion to be drawn from information such as been embodied in the two papers is that if we can only succeed in growing a good variety of cinchona in Ceylon we shall be in the possession of a valuable property,

of soil. There is always sufficient moisture even in well-drained tea to bring about the fermentation; neither, before the leaves are thoroughly withered, does the process commence. It therefore can be very little to the purpose of the planter whether he waters his land or not, as the moisture he gives it must be in excess before the leaves can undergo the change. Therefore the time would be saved, and the risk of soaking the roots avoided, if the tea were allowed to wither on the bushes. Experiments under this system have been successfully made.

The only reason for the withering-room and the rolling-machine being under cover is to protect the tea from the rain, and not from the sun, as is generally supposed. The withering-room is simply a shed with a roof of matting, and the rolling-machine is a table with a top of wood, on which the leaves are rolled by the hand. The tea is then dried in the usual manner, and packed in chests lined with lead.

The only reason why the Chinese tea, of inferior quality, should annually find a market in England, is because it is cheaper than the Indian. The reason for saying that the manufacture is inferior is not because we have tried it and found it so, but because we have seen the Chinese process of manufacture, and know that it is conducted in a careless manner.

Assam tea is valuable.

To the Editor of the Englishman.

Sir,—As you are aware, I opened the other day some Zerdpet chests of tea for your inspection, and you will remember that I then stated that I had packed a portion of it in a very plain, coarse manner, and that I should be glad to have your opinion as to whether it would be worth while to pack the remainder in a more attractive manner. You were kind enough to say that you thought it would be worth while, and I have accordingly done so. I have now the pleasure to send you a sample of the tea packed in the new manner, and I shall be glad to have your opinion as to whether it is worth while to continue packing in this manner. Of course, the tea is the same in both cases, and I have not attempted to improve the quality in any way. I have simply changed the packing. I have also had a few chests packed in a manner which I think will be more attractive still, and I shall be glad to have your opinion as to which of the three samples you prefer. I am, Sir, yours faithfully,

Assam, 7th August 1875. R. C. B.

[We have received the tea, and find that the new packing is a decided improvement on the old. The tea is now put up in boxes of a convenient size, and the lead is lined with paper, which prevents the tea from coming in contact with the lead. The boxes are also painted outside, and have a neat appearance. The tea is of good quality, and we have no doubt will find a ready sale.—Ed. *Englishman*.]

DEHRA DOON.

Ist September 1875.

It is admitted by the best authorities that the tea plants from the Assam hills do not attain to half the size in one year's growth from that obtained from the Dehra plants. During the cold and short time that the latter are dormant they are not losing one atom of their vitality, but are preparing for the next season's growth. Every one of the leaves and buds are filled with sap, which is ready to burst forth at the first approach of warm weather. Now, the Assam plants, during the cold season, are simply dead wood, and do not commence to grow until the warm weather has fairly set in. Therefore, the season of the Assam plants is only about half that of the Dehra plants.

Dehra Dun, 1st September 1875.

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May	1st	2 "
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"	28th	2 "
"	29th	2 "
"	30th	2 "
"	31st	2 "
June	1st	2 "
"	2nd	2 "
"	3rd	2 "
"	4th	2 "
"	5th	2 "
"	6th	2 "
"	7th	2 "
"	8th	2 "
"	9th	2 "
"	10th	2 "
"	11th	2 "
"	12th	2 "
"	13th	2 "
"	14th	2 "
"	15th	2 "
"	16th	2 "
"	17th	2 "
"	18th	2 "
"	19th	2 "
"	20th	2 "
"	21st	2 "
"	22nd	2 "
"	23rd	2 "
"	24th	2 "
"	25th	2 "
"	26th	2 "
"	27th	2 "
"	28th	2 "
"	29th	2 "
"	30th	2 "
"	31st

and. The seed of others I fear will bend during without breeding; these however [illegible] will make, on the weather, if there [illegible] [illegible] [illegible]

[illegible] at intervals (and are added to a cultivated soil). After the Rooms (existing the Grain being are transferred to the drying ground, or on to the threshing, and after drying for several days are packed into bags, and dispatched for consignment to Europe, where they have to undergo a further picking and sorting process before transhipment to their final destination.

The paper was read by Mr. Watts, before the eleven o'clock Circumstances required——by the time one hour [illegible] on the information which I have endeavoured to confound not stretch for some readers we had reached the end of the matter, when our hosts applied to and thanking Mr. Watts for his interesting paper, returned to Nirsan.

A. A. C.

COFFEE LEAF DISEASE.

The following is a letter from Mr. H. B. Cockburn, Coffee grower of the Wynaad, to the Madras Government, dated 20th September 1875, on the subject of the above disease. Mr. Cockburn says:—"I have the honor to forward for the information of Government a specimen of coffee leaves affected by what is called here the coffee disease, and from which I have suffered so much for the last twenty years. The leaves fall off, and their appearance and colour and early disappearance has already the last December covered with yellow blotches of evidently been through the [illegible] attack. Having gathered a number of leaves from trees which had already lost a great many, I placed them in a box, and they became red in patches exactly such as you have received. Coffee so diseased does not improve by keeping, and I therefore forwarded it to Ootacamund by the first opportunity. I have not seen it reported from any other district, but I believe it appears occasionally all over the Nilgiris. Mr. Mollet, who has known the country for many years, can probably tell you more about it than I can. I have been told that it is caused by a fungus, but I do not know whether this has been ascertained. The disease appears at all seasons of the year, but is most severe in the rains, and does not appear to do any permanent injury to the trees, as they recover their foliage as soon as the rains are over. Coffee so diseased does not improve by keeping, and cannot be profitably gathered. Coffee so diseased does not improve by keeping, and cannot be profitably gathered. Coffee so diseased does not improve by keeping, and cannot be profitably gathered

PRICES CURRENT OF FOOD-GRAINS THROUGHOUT INDIA FOR THE 1st JANUARY, 1876.

PROVINCES.	DISTRICTS.	QUANTITIES PER RUPEE IN SEERS OF 80 TOLAHS. Wheat.	Rice (Common).	Great Millet (Cholum, Jowaree, Jondhla).	Lesser Millet (Cumboo, Bajree, Spiked Millet).	Pulse (Gram).	Pulse (Other sorts).	Barley.	Maize (Indian Corn).	Lesser Millets, &c.	Salt.
		S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.
MADRAS.	Cuddapah	No returns received.									
	Nellore	0 11	1 25	1 27	1 22	1 25	1 22	1 25	1 25	1 25	2 25
	Guntoor	0 12	2 0	2 0	2 0	2 0	2 0	2 0	2 0	2 0	2 0
	Kistna	1 0	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	2 25
	Godavery	1 0	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	2 25
	Vizagapatam	1 0	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	2 25
	Ganjam	1 0	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	2 25
	Kurnool	1 0	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	2 25
	Bellary	1 0	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	2 25
	Cuddapah	1 0	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	2 25
	Nellore	1 0	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	2 25
	Guntoor	1 0	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	2 25

EAST INDIA (LOANS RAISED IN INDIA).

Return of the Amount of the Loans raised in India on the Revenues of India, with the rates of Interest payable thereon, issued during the Financial Year 1874-75, the Loans raised during the Year, the Loans paid off during the Year, and the Balance of the Loans outstanding at the end of the Year.

Loans.	Amount of Loans outstanding at the end of 1873-74.	Loans raised during the Year 1874-75.	Loans paid off during the Year 1874-75.	Amount of Loans outstanding at the end of 1874-75.
	£	£	£	£
5 per Cent. Loan of 1858	1,000,000			1,000,000
5 per Cent. Loan of 1859	1,000,000			1,000,000
5 per Cent. Loan of 1861	1,000,000			1,000,000
5 per Cent. Loan of 1862	1,000,000			1,000,000
5 per Cent. Loan of 1863	1,000,000			1,000,000
5 per Cent. Loan of 1864	1,000,000			1,000,000
5 per Cent. Loan of 1865	1,000,000			1,000,000
5 per Cent. Loan of 1866	1,000,000			1,000,000
5 per Cent. Loan of 1867	1,000,000			1,000,000
5 per Cent. Loan of 1868	1,000,000			1,000,000
5 per Cent. Loan of 1869	1,000,000			1,000,000
5 per Cent. Loan of 1870	1,000,000			1,000,000
5 per Cent. Loan of 1871	1,000,000			1,000,000
5 per Cent. Loan of 1872	1,000,000			1,000,000
5 per Cent. Loan of 1873	1,000,000			1,000,000
5 per Cent. Loan of 1874		1,000,000		1,000,000
5 per Cent. Loan of 1875

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OPINIONS OF THE PRESS.

We are glad to learn, that Mr. Knight is about to start a paper after the style of that portion of the *Indian Economist* which used to be called the *Agricultural Gazette*. This was a most interesting and useful publication, and the want of some publication of the kind was much felt.—*Indian Public Opinion.*

Where mining and agricultural enterprise is being developed—as is now the case in India—an interchange of ideas and the diffusion of reliable statistical information, are a *sine qua non*, and for these purposes a special organ, like the one Mr. Knight announces, is really indispensable.—*Statesman.*

Since the discontinuance of the *Economist* with its supplements, there is no paper devoted to agricultural interests in this essentially agricultural country. The new paper should command not only support in the form of subscriptions, but in the scarcely less important point of zealous co-operation on the part of all interested in the land and its products.—*Indian Daily News.*

We have ourselves had thoughts of supplying the want of an agricultural organ in Southern India—agriculture being the weak point of all the Governments in the country—and we are glad to be relieved of the necessity by so practised a statistician and skilful a journalist as Mr Knight.—*Madras Mail, October 8th.*

The "demise" of the *Indian Economist* deprived the country of the only Agricultural, Industrial, and Statistical newspaper in possession; and the new journal is designed to partially supply the place.—*Record of India.*

There is a general movement throughout India respecting the improvement of agriculture, and the mineral wealth of the country, long hidden, is beginning to attract the attention of capitalists. The interest the Editor is in sufficient guarantee that no effort will be spared to make the journal command support and attention.—*Madras Times, October 7th.*

MR. KNIGHT,

Calcutta.

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