

number of fibre-yielding plants, inquires why their produce is not utilized, is told that want of proper machinery is the great obstacle in making a rapid fortune from that source, goes back to the United States, has machinery invented, reads up on the subject of fibres, becomes enthusiastic about it, and now gives the sum total of his studies and inquiries.

There has been a great outcry for fibres, and a great many new substances have been brought into the market; but brokers tell us that they have the greatest difficulty in inducing manufacturers to give them a fair trial, and many have been allowed to rot in the warehouses, or have been sold at ruinous prices to those who sent them, because there was actually no market for them. Indeed, it has become quite an axiom, that the introducer of any new article shares the fate usual to most inventors or discoverers—of not deriving any substantial profit from the benefit conferred upon the public. In spite, however, of the pig-headedness of manufacturers, several fibrous substances have worked their way into the mills by their superior excellence. As a material of paper, the *Esparto* (*Lygeum Spartum*) has carried off the palm. Nearly every ship returning from the Mediterranean, on the shores of which this grass grows in abundance, brings cargoes home. Last year more than 12,000 tons were imported, fetching £4 10s. per ton from the ship's side. The grass is procurable in any quantity, and was used, Pliny informs us, by the ancients for a variety of purposes. So readily is this valuable fibre converted, that a cargo which arrived in the Thames in the morning had been made into paper by the evening. Some of our largest daily papers, a well-known manufacturer assures us, are now printed entirely on materials obtained from the *Esparto*; and we know that a firm is now establishing several manufactories in the Mediterranean for the purpose of sending the "pulp" home, and thus save the high freightage caused by the bulkiness of the raw produce. Mr. Squier does not allude to this important production, though it is found in the tropics. Another article, now largely imported and growing in public favour, is the jute fibre (*Cochorus capularis*), which, mixed with other substances, is capital for weaving purposes. Large fortunes in it were lost and won when, some time ago, at the height of the cotton famine, it was announced that a substitute for cotton had been discovered, and all the world concluded that this could be no other than jute. Sad was the effect upon certain speculators when this supposed substitute turned out to be *Zostera marina*, a European sea-side weed, certainly containing fibre, but one so difficult to extract, that under the most favourable circumstances a pound cleaned could not be obtained for less than ninepence. Mr. Squier speaks highly of a plant of Yucatan, which he terms *Agave Sisilana* (we cannot find the name in any scientific work), which yields the fibre known as "Sisil hemp," and of which, in 1854, 925,900 lbs. were imported into the United States, valued at 100,000 dollars. Attempts have been made to cultivate this plant in Florida, and Congress was persuaded to grant considerable tracts of land to a company formed for that purpose; but the savage nature of the Indians led to the failure of the enterprise. We doubt, even if no such impediment had intervened, whether it would ever pay to cultivate any species of the genus *Agave*. They take three to five years before they are sufficiently large to allow their leaves to be cut, and all that time there is no return for the capital invested, and even then the yield of the plants is not sufficient to repay any large outlay, or bear competition with hemp, jute, cotton, flax, or any other fibrous plants bringing a return the same year they are sown. *Agave* fibres are undoubtedly strong and durable. Some of the paper made by the old Aztecs for their picture-writings is still in existence; and we strongly approve of the resolution of the Mexican government, to allow no other paper for all public documents than that made of *Agave Americana*. It may pay to collect *Agave*

leaves on the arid mountain-tops, where they exist in a wild state, but it would be ill-advised to start or encourage *Agave* plantations as has been proposed. Mr. Squier is evidently wrong in believing that the Pará grass is derived from *Attalea funifera*; it is derived from *Leopoldinia Piassaba*, and is a superior sort to that collected from *Attalea funifera*, which comes to us from Bahia, and sells at the rate of £17 to £18 per ton, whilst the Pará sort fetches as much as £38 in our markets.

Mr. Squier's work, notwithstanding its blunders, is extremely well got up, and enriched with various beautiful plates of fibre-bearing plants, and may serve to draw attention to an important subject, to which we wish that the author had been more capable of doing justice.

ARISTOTLE'S METEOROLOGY.

MÉTÉOROLOGIE D'ARISTOTE. Traduite en Français pour la première fois, et accompagnée de Notes perpétuelles. Par J. BARTHÉLEMY SAINT-HILAIRE. Membre de l'Institut. Paris: Ladrangé. 1863.

THE accomplished Orientalist, M. Barthélemy St.-Hilaire, is widely known as an elegant translator of large portions of Aristotle's works. He has now issued a serviceable translation of a neglected but curious treatise of that author, which we are sure will prove acceptable to many men of modern ideas. Aristotle's "Meteorology" represents the state of that science as it existed more than 2000 years ago, and continued to be its only text-book until the dawn of the modern era. As a translation, M. St.-Hilaire's work is all we could desire, for the text is rendered in fluent French, without a taint of archaism, and is illustrated by useful notes, without a particle of pedantry. A preface of some length sets forth with great ability the claims of Aristotle to consideration among meteorologists, and includes a masterly sketch of the modern state of meteorology, drawn with sharper outlines and fewer strokes than we recollect to have met with in any similar attempts. M. St.-Hilaire claims more than the reputation of a theorist for his favourite author; and considers that in none of his works more manifestly than in his "Meteorology," has Aristotle shown himself an enquirer after the facts of nature and a true experimenter. Then extending his remarks from particulars to general instances, M. St.-Hilaire contrasts the subtle and metaphysical character of the Hindu mind, which has never succeeded in elaborating any scientific work, with the copious writings left us by the Greeks.

Aristotle's "Meteorology" is so neglected by scholars, who find its topics little suited to their taste, and so unknown to men of science who, as a rule, cannot read Greek with fluency, that the contents of the present volume are likely to cause surprise. Meteorologists little suspect that a considerable part of the ground-plan of their science was mapped by that comprehensive philosopher three-and-a-half centuries before the Christian era. Where they may have expected to find random notes on weather-wisdom, interspersed with nonsense about occult agencies and influences of the stars, they will find a treatise that discusses evaporation and condensation of vapour; the formation of clouds, rain, hail, dew, and hoar-frost; the circulation of water from the ocean, through the clouds to the rivers, and thence back to the ocean; and heat, or at least "dry exhalation," and its influence on winds. They will find discussions on rain-bows, halos, and parhelia, and may also follow the author along paths that lie outside the domains of modern meteorology, and lead to theories on comets and the milky way. It is the extent of Aristotle's plan, more than the success with which he attacks his problems, that astonishes us. The headings that would be suitable to the chapters of this ancient work would go far to supply those of a modern

text-book. It makes one indignant at the abjectness of mind of the men of the middle ages, who rested content with bold outlines like these as the goal, and not the starting-point, of their studies.

Hardly one theory in the present work of Aristotle is exactly accordant with fact, because no permanent basis of physical science had been established in his day, and his data are full of errors—yet it is curious to note the closeness with which his conclusions run parallel to the truth. In despite of the small scientific advance of his age, and his own inveterate tendency to theorise on fanciful grounds, it is strange to observe how the great sagacity of the man sufficed to direct him to generalizations which compel our admiration. We cannot estimate his genius aright unless we measure him by his contemporaries. It seems scarcely credible that in his day, when meteorology had long become the accepted name of a science, Anaxagoras should have had followers who gravely accounted for rivers, on the supposition that their sources were holes that tapped subterranean reservoirs, and that the bigger the hole the mightier the stream. Aristotle shows that although subterranean reservoirs doubtless exist, they are a very inadequate cause of rivers. The water supplied by the actual sources is an insignificant portion of the volume of any stream, and if a reservoir were tapped it would run dry; also if the sea received all the rivers without any compensatory loss, it would rise continually. He then explains the difficulty aright, by showing that vapour rises from the sea and earth, and is condensed into cloud and rain by the cold of the higher regions, and afterwards falls on the earth, to be drained seaward by the rivers. He proclaims that all great rivers rise in lofty mountains, and justly accounts for the reason; but his instances of fact include the Danube, which he derives from the Pyrenees, and the Don from the Hindu Kosh!

The fourteenth chapter contains a remarkable and characteristic argument of the secular changes of the earth's surface from land to sea. It begins, as usual, with a wrong theory, and works round to an almost just conclusion. He says that the exhalation of moisture in any part of the earth varies from epoch to epoch. That as animals flourish and decay, so the earth shows variations of vigour, which affect it partially, sometimes in one part and sometimes in another—whence it results that certain portions become dry and others are covered with water. The establishment of dry land, where the sea had stood, is only effected "in immense periods of time, compared to the term of our existence. Nations perish too quickly to retain a recollection of these vast changes." He utters the memorable saying that Egypt is entirely made by the Nile; and proves the assertion by an erroneous fact, for he argues from Homer's prominent mention of Thebes that Memphis could not then have existed, and, therefore, that the lower part of Egypt was unformed in Homer's days, and was deposited in the few centuries that separated Homer's era from his own. He concludes, "It is clear, since time never stays, and the universe is eternal, that the waters of the Don and the Nile have not always flowed, and that the place where their waters run at this moment has at one period been dry land. If the sea abandons some places and returns to others, it is evident that the same districts are not always seas or continents, but that everything changes its character in the course of ages." "Nothing can be more clearly expressed than this; and we should accept Aristotle's idea as equally advanced with those of our own schools of even a few years back, were it not that Aristotle has certainly no distinct notion of the sea maintaining an uniform level. We rather think the leading idea in his mind was that banks of mud were continuously deposited at the mouths of rivers, until the water above them became so shallow as to admit of being wholly dried, when an epoch of drought happened to set in.

Aristotle's mind was penetrated with the Kosmic character of all phenomena, and with the insignificance of the earth compared with the universe. The hardihood and justness with which he speculated on the winds of the Southern and unknown hemisphere from the analogy of the Northern, seems to us one of his grandest efforts. He knows so little of the earth that he supposes the equatorial portion of Africa to be as uninhabitable from heat as the Northern portion of Europe was supposed to be unendurable from cold. The breadth of his habitable world is bounded towards the west by the gates of the unknown ocean at the Straits of Gibraltar, while the same ocean washed the shores of some Indian territory to the east. Yet he boldly speculates on the condition of the unknown remainder. He shows that the Southern hemisphere must contain a habitable zone, and that as the equatorial heat urges currents of wind towards the pole in our North hemisphere, so the same extreme heat must have a similar action in the South.

In short, Aristotle's "Meteorology" is a very remarkable and interesting work, and being rendered into a readable shape by its modern French dress, and by the aid of the excellent notes and preface of its translator, we have pleasure in cordially recommending it to all who interest themselves in the progress of meteorological science. F. G.

THE TRANSPORTATION OF CRIMINALS: being a Report of a Discussion at a Special Meeting of the National Association for the Promotion of Social Science, held at Burlington House, on the 17th February, 1863. Edited by J. R. FOWLER, and MARTIN WARR, JUN., Barristers-at-Law. Secretaries to the Third Department. (Printed by Order of the Council.) London: Emily Faithfull. 1863.

LETTERS ON TRANSPORTATION, as the only means of Effectual Convict Reform; also, Letters on the Revolting Cruelties Practised under the Game Laws, showing these Laws to be one of the most Prolific Sources of Convictism. By WILLIAM HOWITT. London: A. W. Bennett. 1863.

THE transportation question stands at present in this condition. Western Australia desires to have convicts sent her, as other colonies in a similar early stage of advancement have so desired before. A time may come, as it has already come to every other colony to which convicts have been sent, when Western Australia also will feel herself able to walk alone, and, failing to derive from the presence of convicts any material advantage sufficient to compensate for the moral disadvantage, will warn us, in language not to be slighted, that she can receive no more. Shall we avail ourselves of Western Australia as a penal colony during the interval? Shall we create new, and ever new, settlements, to occupy, towards this question, from time to time the same relation in which Western Australia stands to it now? Towards the solution of these queries the speeches of Lord Alfred Churchill and Major Sanford, in the discussion held by the Social Science Association, do us the service of letting us know distinctly what it is that Western Australia wants, and what alone she will take from us.

"What," said Lord Alfred Churchill, "do we find in Western Australia? The ticket-of-leave man, as soon as he has served a certain amount of time in forced labour for the Government, receives his ticket-of-leave. He then goes into the labour-market, and obtains the full advantage of his labour. The consequence is, that there is not that inducement which there formerly was for him to break loose. He receives wages, and is treated in every respect, so far as the value of his labour is concerned, as other free men are. . . . What the Western Australians require is, that a certain proportion of free labourers should, if possible, go there as well as the convicts—especially that there should be a considerable immigration of women. It has been found that Irish girls, for instance, are not prejudiced against marrying ticket-of-leave men. This is a system we ought to encourage, combined with that of allotments to military pensioners, which is already partially done. There would then be, I have no doubt, an any amount of convict transportation which is likely to take place. I do not think it would be wise to send more than about 1000 or 1500 convicts to Western Australia annually: for the simple reason, that more would tend to choke up the colony, and bring about a state of things which the other colonists objected to. Formerly New South Wales and Tasmania received about 4000 annually. Again, Western Australians say, 'We would rather not have the worst convicts, but the class which are likely to be reformed.' But though they state that as their opinion, they do not make any condition. They leave it in the hands of the Government to take any steps they may like upon it; but their object is, that they may be enabled to have a number who would settle in the colony, cultivate their lands, and make the roads into the interior. There

is another point: a ticket-of-leave man in Western Australia can acquire property and cultivate lands of his own; there are numerous instances of his doing so, and, therefore, he is in an entirely different position from the former ticket-of-leave man."

And Major Sanford stated—
"That the colonists were willing to receive convicts, it being understood that a certain number were to be sent annually for a certain term of years; but they did not wish to take forgers, or what might be called respectable thieves, but would not be averse to taking garroters. He mentioned an instance of such criminals lately sent out, who had waylaid some carts and garrotted those in charge of them. They were convicted and sentenced to death, but the settlers memorialized and obtained a commutation of their sentence."

It is avowed, then, that Western Australia desires convicts whose condition may be made so desirable that they shall be under no inducement either to escape or to turn their hands against society—a consummation to be reached by offering them freedom, wages, wives, and property; that for this advancement she would select felons guilty of crimes of violence, as being, by their capacity for physical labour, better able to furnish the consideration she looks for than those whose career has merely been distinguished by mental ingenuity; finally, and as a measure of the reliance to be placed in the representations we have heard of the reformatory effects of transportation to Western Australia, that she will wink at a repetition of crimes of violence in the colony, rather than lose the coveted labour. We said that this colony was passing through the normal state of youthful settlements in reference to the convict question. That is so, generally, but with an important specific difference: for we believe that language so strange as that which we have quoted has been used on the subject by no other colony. The key to this difference is to be found in a pregnant confession of Lord Alfred Churchill.

"It is right," said he, "that you should clearly understand what the position of Western Australia is. It was formed, I believe, some twenty or thirty years ago. The first colonists actually abandoned it because they found they could gain nothing in it."

The italics are ours, and they mark our emphatic agreement in the propriety of the case being, as his lordship says, clearly understood. Elsewhere, settlements have been founded in fertile soils, by magnificent harbours, in countries abounding in mineral wealth, naturally destined to be the cradles of great states. A tide of free emigration has flowed to them, able of itself to subdue the wilderness, and sure to demand in no long time the necessary appliances of a large civilised population. It is from such examples that the favourite instances are drawn, which seem to show convict labour to be a useful help to a young colony. For one pound of value, which has been derived from its employment on private lands, its employment on public works has conferred many—in hastening the conversion of thriving villages into splendid cities and convenient ports. Take the case of Tasmania:—

"Where did you land?" asked Sir William Denison of Mr. Howitt. "At Launceston." "Well, you found a good town there, well paved, well lighted, with good public buildings, quays, warehouses, courthouse, theatre, barracks, and the like. That is the work of convict labour. When you wished to come hither, you found a good long coach, as well horsed and appointed as ever issued from the Bull-and-Mouth, or the 'White Horse Club' in London. It bowled you away over as finely macadamized a road, at ten miles the hour, as over any road in England. You passed over substantial bridges, you saw right and left cultivated estates and fine country mansions. There again you have the product of convict labour. Here you are in a beautiful town, with good lighting, good paving, all sorts of excellent buildings, Government offices, high school, splendid custom-house and docks, barracks for soldiers, and barracks for convicts, an excellent market-house with its noble fountain—all that is the effect of convict labour. Look there, just below these windows, there is not a great fleet certainly, but a goodly little wool of masts. If you had been here a few years ago, you would not have seen those vessels of 1200 tons, lying close under the town, but the grooms and carters there washing their horses' legs—for the estuary at that part was only some two or three feet deep. Now they have a commodious port. That port I dug, and built those solid piers, with convict labour; and had the opposition party allowed me to receive foreign convicts, before I left I would have made them another port as capacious and good."

The execution of these works for the public, we admit, was, or might have been, a sufficiently penal, though not cruel, employment; and it accelerated the perfection of a civilisation otherwise bound to take root and develop itself. But what is there that resembles this, in that which is less a transportation than a forced emigration, with a shortened time of employment on public works, in a colony where they are never likely to be needed on a great scale, and an enfranchisement, in order to supply to emigrants the labour which, if so supplied, may perhaps (such is the hope held out) tempt them even to Western Australia? The precedent is that of assisting nature, the course in defence of which it is cited, is that of thwarting

her. We are to furnish inducements, "the result of which," as Sir Walter Crofton said in the same discussion, "would assuredly be, that for every five garroters we should have ten," and all in order to roll up-hill a very stone of Sisyphus—to create colonies where they will not thrive. And, be it observed, the objection is not one applicable to Western Australia alone: it extends to every such settlement which it would still be possible to form, whether in Northern Australia or anywhere else. The tide of emigration runs now so fast, wherever the locality is really suited for colonization, that the interval is almost suppressed during which, in cases like that of Tasmania, convict labour or public work was possible or desirable. No sooner are the advantages of a situation known, than the rush of free labour precipitates the stage of advancement at which the importation of convicts ceases to be endurable, and which Tasmania reached about 1846. Our flourishing colonies will not have the convicts, and only the less suitable locations are left for the costly experiment which Mr. Howitt still calls on us to perform.

"I am not going to argue the question," said Mr. Hastings, in the discussion of the Association, "whether it is wise or unwise on the part of the mother-country to defray the cost of emigration to the colonies; but I am quite sure of this, that if you spend money in supplying labour to our dependencies, you ought to take care that the expenditure flows both at home and in the colonies into the natural channels. If you want to pay for emigration, pay for the emigration of the honest and industrious, and not of the dishonest and the idle. Take the respectable labourer, and not the rascals from your jails. Go into Lancashire, and save the cotton-spinners from their undeserved calamity; go to Coventry, and take the starving weavers; thin the labour-market of your agricultural counties, and raise the man, struggling with a wife and children on a few shillings a week, to the affluence of emigration. . . . I maintain that you have no right to spend on the criminal class a shilling more than is absolutely necessary for the purpose of first punishing and then of reclaiming them. You have no right to take one shilling from the taxpayers of this country in order to send out your convicts to places where they may do better than honest men can do at home."

The speech of Mr. Hastings, from which we have just quoted, contains a very able review of the arguments on the question of transportation, and we recommend it, as well as the whole discussion, to the consideration of those who would fain shrink from confronting that great, but inevitable difficulty of the age—the treatment of our criminal classes at home.

THE NATIONAL ALMANAC; or, ANNUAL RECORD FOR THE YEAR 1863. Philadelphia: George W. Childs; London: T. Fisher.

THIS is the first of a series which is to appear annually, and which professes to contain accurate and reliable information connected with the condition of the Federal Government and the respective States of the Union, in their manifold interests, "whether political, social, industrial, agricultural, commercial, financial, ecclesiastical, educational, or literary." And it must be admitted that on each of these subjects much useful information is given—if the statements made, and the figures tabulated, can be relied on as accurate. In this volume there are 698 closely packed pages, bristling with figures, sometimes neatly arranged as tables of population, statements of imports and exports, miles of road, income and expenditure, and all else that goes to make up those wonderful and impenetrable data which cautious reasoners never venture to attack. Sometimes, again, the most intricate diagrams are presented, marked along and across with straight lines, and traversed in all directions with eccentric lines, which would be infinitely instructive, if they could be understood with a fair amount of study. But though these lines and figures are puzzling, there is much in the plain prose of this bulky volume well worth understanding, as it relates to the actual condition of a country, the past growth of which is without parallel in the history of the world.

As regards the population, of which a census has been taken eight times, at periods of ten years, beginning at 1790 and ending in 1860, an increase is witnessed that confounds all calculation as applied to any nation known to ancient or modern history. In 1790, the census return was within a few thousands of 4,000,000; a mere handful when compared even with third or fourth-rate European states; but when last taken in 1860, emigration had done its work. The millions of acres over which the people spread themselves called on them to increase and multiply; and those who found how unstimulated they were in room, invited friends and relatives from all parts of the world: and hence, with scope for the activity of all human energies, wealth sprang into existence as if by magic, whilst the energetic men and women from all countries in Europe who poured