

IV. *An Account of the Harmattan, a singular African Wind.*
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THE Harmattan is a periodical wind which blows from the interior parts of Africa towards the Atlantic Ocean, and possesses such extraordinary properties, as to merit the attention of the naturalist, making a curious and important article in the history and theory of the winds.

The first information I had on this subject was from my friend Mr. NORRIS, who has frequently visited the Coast of Africa, and is a gentleman of an excellent understanding and strict veracity. This information immediately excited my attention; and as Mr. NORRIS was preparing to make another voyage to that part of the world, I desired him to confirm the facts which he had related, by further inquiries, experiments, and observations; and it is from these materials, with which I have been obligingly furnished by Mr. NORRIS, that the following account is drawn up.

On that part of the Coast of Africa which lies between Cape Verd and Cape Lopez, an easterly wind prevails during the months of December, January, and February, which by the Fantees, a nation on the Gold Coast, is called the Harmattan. Cape Verd is in 15° N. latitude, and Cape Lopez in 1° S. latitude, and the coast between these two Capes runs, in an oblique direction,

direction, nearly from W.S.W. to E.S.E. forming a range of upwards of two thousand one hundred miles. At the Isles de Los, which are a little to the northward of Sierra Leone, and to the Southward of Cape Verd, it blows from the E.S.E. on the Gold Coast from the N.E. and at Cape Lopez and the River Gabon from the N.N.E. This wind is, by the French and Portuguese who frequent the Gold Coast, called simply the N.E. wind, the quarter from which it blows. The English, who sometimes borrow words and phrases from the Fantee language, which is less guttural and more harmonious than that of their neighbours, adopt the Fantee word Harmattan.

The Harmattan comes on indiscriminately at any hour of the day, at any time of the tide, or at any period of the Moon, and continues sometimes only a day or two, sometimes five or six days, and it has been known to last fifteen or sixteen days. There are generally three or four returns of it every season. It blows with a moderate force, not quite so strong as the sea breeze (which every day sets in during the fair season from the W. W.S.W. and S.W.); but somewhat stronger than the land wind at night from the N. and N.N.W.

1. *A fog or haze* is one of the peculiarities which always accompanies the Harmattan. The gloom occasioned by this fog is so great, as sometimes to make even near objects obscure. The English fort at Whydah stands about the midway between the French and Portuguese forts, and not quite a quarter of a mile from either, yet very often from thence neither of the other forts can be discovered. The sun, concealed the greatest part of the day, appears only about a few hours about noon, and then of a mild red, exciting no painful sensation on the eye.

As the particles which constitute the fog are deposited on the grass, the leaves of trees, and even on the skin of the negroes,

so as to make them appear whitish, I recommended to Mr. NORRIS the use of a good microscope, as this might possibly discover something concerning the nature of these particles. "I was prevented," says Mr. NORRIS, "by the bad state of my health from availing myself of the microscope; neither could I discover any thing by the taste, or by exposing plates covered thinly with melasses, for when I had dropped an acid or alkali into the water in which I had dissolved the melasses, nothing followed to enable me to judge of the nature of the particles. Surely they cannot be insects, or animalculæ of insects? for we have no appearance of any thing produced from the myriads of them which are deposited on the earth. They do not flow far over the surface of the sea: at two or three miles distance from the shore the fog is not so thick as on the beach; and at four or five leagues distance it is intirely lost, though the Harmattan itself is plainly felt for ten or twelve leagues, and blows fresh enough to alter the course of the current."

2. *Extreme dryness* makes another extraordinary property of this wind. No dew falls during the continuance of the harmattan; nor is there the least appearance of moisture in the atmosphere. Vegetables of every kind are very much injured; all tender plants, and most of the productions of the garden, are destroyed; the grass withers, and becomes dry like hay; the vigorous ever-greens likewise feel its pernicious influence; the branches of the lemon, orange, and lime trees droop, the leaves become flaccid, wither, and, if the harmattan continues to blow for ten or twelve days, are so parched as to be easily rubbed to dust between the fingers: the fruit of these trees, deprived of its nourishment, and stunted in its growth, only appears to ripen, for it becomes yellow and dry, without acquiring

acquiring half the usual size. The natives take this opportunity of the extreme dryness of the grafs and young trees to set fire to them, especially near their roads, not only to keep those roads open to travellers, but to destroy the shelter which long grafs, and thickets of young trees, would afford to skulking parties of their enemies. A fire thus lighted flies with such rapidity as to endanger those who travel: in that situation a common method of escape is, on discovering a fire to windward, to set the grafs on fire to leeward, and then follow your own fire. There are other extraordinary effects produced by the extreme dryness of the Harmattan. The covers of books, Mr. NORRIS informs me, even closely shut up in a trunk, and lying among his cloaths, were bent as if they had been exposed to the fire. Household furniture is also much damaged: the pannels of doors and of wainscot split, and any veneered work flies to pieces. The joints of a well-laid floor of seasoned wood open sufficiently to lay one's finger in them; but become as close as before on the ceasing of the Harmattan. The seams also in the sides and decks of ships are much injured and become very leaky, though the planks are two or three inches in thickness. Iron-bound casks require the hoops to be frequently driven tighter; and a cask of rum or brandy, with wooden hoops, can scarcely be preserved; for, unless a person attends to keep it moistened, the hoops fly off.

The parching effects of this wind are likewise evident on the external parts of the body. The eyes, nostrils, lips, and palate, are rendered dry and uneasy, and drink is often required, not so much to quench thirst, as to remove a painful aridity in the *fauces*. The lips and nose become sore, and even chapped; and though the air be cool, yet there is a troublesome sensation of prickling heat on the skin. If the Harmattan continues

four or five days, the scarf skin peels off, first from the hands and face, and afterwards from the other parts of the body, if it continues a day or two longer. Mr. NORRIS observed, that when sweat was excited by exercise on those parts which were covered by his cloaths from the weather, it was peculiarly acrid, and tasted, on applying his tongue to his arm, something like spirit of hart's-horn diluted with water.

As the state of salt of tartar placed in the open air, and the quantity evaporated from a given surface of water, are obvious proofs of the comparative moisture or dryness of the atmosphere, I desired Mr. NORRIS to put the Harmattan to each of these tests; and particularly to moisten salt of tartar *ad deliquium*, and expose it to the night air during the time that the Harmattan was blowing. The following is the account of the result of these experiments. Salt of tartar will not only remain dry during the night as well as in the day; but, when liquified so as to run upon a tile, and exposed to the Harmattan, becomes perfectly dry in two or three hours; and, exposed in like manner to the night air, will be dry before morning.

With respect to evaporation Mr. NORRIS says, “ I fixed the
“ tin vessel, with which you favoured me, on a grass plat
“ behind my house, upon a stand four feet high, and exposed
“ by its situation most part of the day to the sun, but sheltered in some measure from the wind by the house.”

Day

Day of the Month.	Evaporation of one tenth of an inch.	Thermometer			Remarks.
		6 Morn.	1 Noon.	6 Even.	
Nov. 27	1½	—	—	—	Light breeze and hazy.
28	2	—	—	—	Ditto and fair weather.
29	2	—	—	—	{ Hazy with regular land and sea breezes.
30	1½	—	—	—	Ditto.
Dec. 1	1½	—	—	—	Ditto.
2	2	76	80	79	Fresh breezes and fair.
	Day. Night.				{ Harmattan began to blow moderately.
3	2 1	74	76	75	{
4	2½ 1½	75	77	76	Harmattan still blowing, but moderately, and the fog not considerable.
5	2 1	74	76	76	Harmattan almost over.
6	2	76	80	78	{ Harmattan over, sea breeze as usual, hazy.
7	2	76	80	78	Light breeze and hazy.
8	2	76	80	78	Ditto.

“ The thermometer hung in a large warehouse near a window on which the sun never came at that season of the year, as it had a north aspect, and where little reflected heat came, a grass plat being before it. When removed into the next room, which had three windows and a door opening into the parade, the thermometer usually rose 4° higher than it did in the warehouse; its general height in the room, from one to three o’clock, was 84°.

“ On the 14th of December, when there was no Harmattan, the thermometer at noon, on putting it into the evaporating vessel, rose to 88°; on taking it out, it sunk to 79°, whilst the moisture on its surface was evaporating; but on exposing it five minutes to the sun it rose to 102°. On the fifteenth of December the thermometer, exposed to the wind in my

“ room window, but not to the sun, stood at noon at 84° ; at
 “ 88° in the evaporating vessel; sunk to 80° as the water eva-
 “ porated from its surface; rose in the sun in six minutes to
 “ 104° ; and, on putting it into the water-jar in my room,
 “ sunk to 76° .”

It appears from the preceding experiments made by Mr. NORRIS, that, if the evaporation of the whole year be supposed to go on in the same proportion with what occurred during a short and very moderate return of the Harmattan, the annual Harmattan evaporation would be 133 inches; and if the calculation was made in proportion to the evaporation which occurs during a longer visit from the Harmattan, and a more forcible breeze, the annual Harmattan evaporation would be much more considerable. If the annual evaporation be in like manner calculated, in proportion to the evaporation which took place subsequent to and preceding the Harmattan, the annual evaporation at Whydah on the Gold Coast would be 64 inches, and I have found the annual evaporation at Liverpool to be 36 inches*. These three therefore are in the following proportion; Harmattan 133 inches, Whydah 64 inches, and Liverpool 36 inches.

As the names of things are often derived from some remarkable property in the thing denoted, I desired Mr. NORRIS to inquire into the derivation of the word Harmattan. He found it to be a corruption of *Aberramantah*, the name of that season in which this wind blows. *Aherramantah* is compounded of *Aberraman*, which in the Fantee language signifies to blow, and *tab*, tallow or grease, with which the natives rub their skins to prevent their growing dry and rough.

* Philosophical Transactions, vol. LXVII. p. 252.

The Harmattan season is in the Dunco language called *Pep-peh*, signifying a dry and rough skin.

3. *Salubrity* forms a third peculiarity of the Harmattan. Though this wind is so very prejudicial to vegetable life, and occasions such disagreeable parching effects on the human species, yet it is highly conducive to health. Those labouring under fluxes and intermitting fevers generally recover in an Harmattan. Those weakened by fevers, and sinking under evacuations for the cure of them, particularly bleeding, which is often injudiciously repeated, have their lives saved, and vigour restored, in spite of the doctor. It stops the progress of epidemics: the small-pox, remittent fevers, &c. not only disappear, but those labouring under these diseases when an Harmattan comes on, are almost certain of a speedy recovery. Infection appears not then to be easily communicated even by art. In the year 1770 there were on board the *Unity*, at Whydah, above 300 slaves; the small-pox broke out among them, and it was determined to inoculate; those who were inoculated before the Harmattan came on got very well through the disease. About seventy were inoculated a day or two after the Harmattan set in; but not one of them had either sickness or eruption. It was imagined, that the infection was effectually dispersed, and the ship clear of the disorder; but in a very few weeks it began to appear among those seventy. About fifty of them were inoculated the second time; the others had the disease in the natural way: an Harmattan came on, and they all recovered, except one girl, who had an ugly ulcer on the inoculated part, and died some time afterwards of a locked jaw. The great salubrity, and the power of checking epidemics, are such extraordinary properties of the Harmattan, that I desired Mr. NORRIS, on his next voyage to the Coast, to ascertain these points by further inquiries.

inquiries. "I have not much new," says Mr. NORRIS, "on
" these points, save the general testimony of the natives in con-
" firmation of what I have already communicated; and that I
" had been very ill myself for nine days with a remittent fever
" this voyage, of which I recovered immediately upon the Har-
" mattan beginning to blow; whether from the medicines
" which I had taken, or from the alteration in the state of the
" atmosphere, I pretend not to determine. I now learned, for
" the first time, that the Harmattan is noted for contributing
" much to the cure of ulcers, as well as cutaneous eruptions."
Mr. NORRIS is sorry to be obliged to dissent from so respectable
an authority as that of Dr. LIND, who speaks of the Harmattan
as "fatal and malignant; that its noxious vapours are destruc-
" tive to Blacks as well as Whites; and that the mortality
" which it occasions is in proportion to the density and duration
" of the fog." The baneful effects here pointed out proceed
from the periodical rains which fall in March, April, &c. and
which are ushered in by the Tornadoes, or strong gusts of wind
from the N.E. and E.N.E. accompanied with violent thunder
and lightning, and very heavy showers. The earth drenched
by these showers, and acted upon with an intense solar heat as
soon as the storm is over, sends forth such noisome vapours as
strike the nostrils with a most offensive stench, and occasion
bilious vomitings, fluxes, and putrid fevers. Besides these va-
pours, which are annual, there appears to be a collection of
still more pestiferous matter, confined for a longer time, and
issuing from the earth after an interval of five, six, or seven
years. "The periods," says Mr. NORRIS, "which I remem-
" ber to have been thus marked, were in 1756, when Governor
" MELVILL and most of the gentlemen and soldiers at Cape
" Coast, died; in 1763, 1769, and 1775. The mortality
" in

“ in some of these years, for they were not all equally fatal,
“ was so great that, as Dr. LIND says, the living were scarce
“ sufficient to remove and bury the dead.”

It is to be observed, that there may be instances in which the Harmattan comes loaded with the effluvia of a putrid marsh; and if there are any such situations, the nature of the wind may be so changed as to become even noxious.

Another inquiry which I desired Mr. NORRIS to make respected the source of the Harmattan, and the nature of the soil over which it blows. It appears that, except a few rivers and some lakes, the country about and beyond Whydah is covered for four hundred miles back with verdure, open plains of grass, clumps of trees, and some woods of no considerable extent. The surface is sandy, and below that a rich reddish earth; it rises with a gentle ascent for one hundred and fifty miles from the sea before there is the appearance of an hill, without affording a stone of the size of a walnut. Beyond these hills there is no account of any great ranges of mountains.

With respect to the origin of this wind, Mr. NORRIS says,
“ the Harmattan, according to Dr. LIND, arises from the con-
“ flux of several rivers about Benin; but when I was on a
“ visit to the King of Dahomey, one hundred and twenty
“ miles North, or inland from the Fort at Whydah, I there
“ felt the Harmattan blowing from the N.E. stronger than I
“ have at any other time, though Benin then bore from me
“ S.E.”

On this head Mr. NORRIS makes the following conjecture:
“ The intersection of three lines, viz. an east line drawn from
“ Cape Verd, a north-east one from the centre of the Gold
“ Coast, and a north line from Cape Lopez, would, I think,
“ point out a probable source of this extraordinary wind.”

Three

Three lines, drawn according to the direction of Mr. NORRIS, towards the points of the compass from which the Harmattan blows on Cape Verd, the Gold Coast, and Cape Lopez, converge I find to a part of Africa about the 15th degree of N. latitude, and the 25th degree of E. longitude, which I also find to be that part of Africa where, according to PROLEMY, the mountains of Caphas are situated. From these mountains, according to the same authority, the river Daradus arose, supposed by some to be now the river Senegal.

It may be conjectured, that the disagreeable Levant wind of the Mediterranean proceeds from the same part of the Continent of Africa; for it prevails during the same season of the year, and may derive its qualities from the surface over which it passes.

The last article of information with which I have been favoured by Mr. NORRIS, is an account of the manner in which the Fantee nation divide their year.

Aherramantah, from the 1st of December to the middle of February, about 10 weeks.

Quakorah, a wind up the coast, from S.S.W. to S.S.E. from the middle of February to the first week in March, about 3 weeks.

Pempina, or Tornado season, part of March, all April, and the greatest part of May, about 12 weeks.

Abrenama, or the old man's and woman's children, that is, the Pleiades, the rainy season, the latter end of May, all June, and to about the 20th of July, 8 weeks.

Atukogan, or five stars, that is, Orion, high wind and squally, the rains very heavy, to the middle of August, 3 weeks.

Worrobakorow,

Worrobakorou, or one star, the ceasing of the rains, about 3 weeks.

Mawurrah, the name of a certain star; close, foggy weather and no breeze, the first three weeks in September.

Boutch, no land breeze in this season, the wind blows fresh down the Coast, about six weeks.

Autiophi, or the Croziers; Tornadoes and southerly wind, with some rain, generally called the latter rains, about four weeks, to the beginning of December, when the Aherramantah season again commences.

