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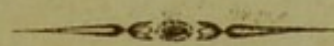




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MEDICAL TRACTS.

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|------------------------|---|----------------------|
| I. ON SUGAR. | } | V. ON THE PLAGUE; |
| II. ON THE COW-POX. | | AND YELLOW FE- |
| III. ON THE YAWS. | | VER OF AMERICA. |
| IV. ON OBI; OR AFRICAN | | VI. ON HOSPITALS. |
| WITCHCRAFT. | | VII. ON BRONCHOCELE. |
| | | VIII. ON PRISONS. |



BY

BENJAMIN MOSELEY, M. D.

AUTHOR OF A TREATISE ON
TROPICAL DISEASES;
MILITARY OPERATIONS;
AND THE
CLIMATE OF THE WEST INDIES;

AND

A TREATISE ON COFFEE:

PHYSICIAN TO CHELSEA HOSPITAL,
MEMBER OF THE COLLEGE OF PHYSICIANS OF LONDON,
OF THE UNIVERSITY OF LEYDEN,
OF THE AMERICAN PHILOSOPHICAL SOCIETY
AT PHILADELPHIA, &c. &c.

SECOND EDITION,

WITH CONSIDERABLE ADDITIONS.

LONDON:

PRINTED BY JOHN NICHOLS,
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ANATOMICAL TRACTS

THE ANATOMICAL TRACTS
PUBLISHED BY THE
LONDON AND EDINBURGH
MEDICAL SOCIETY
IN THE YEAR 1825

BY JAMES MONRO, M.D.

OF A TREATISE ON

THE DISEASES OF THE

INTERNAL ORGANS

OF THE WEST INDIES

AND

OF THE DISEASES OF THE

INTERNAL ORGANS OF THE

WEST INDIES

BY JAMES MONRO, M.D.

OF THE WEST INDIES

SECOND EDITION

WITH ADDITIONAL

LONDON

P R E F A C E
TO THE
S E C O N D E D I T I O N .

MY endeavour in the first edition, or rather sketch of this work, to penetrate the dense umbrage, which has so long enveloped the principal objects of my research, has been favourably received by the public; and by those individuals, who themselves have laboured, without a pioneer, in the unfrequented recesses of literature.

In this edition much new matter will be found; and I am not without hopes that some

of it will be acceptable to the friends of science, and to the promoters of public good.

In the republic of letters, it is admitted as a fundamental axiom, that every person has a right to treat a commodity he has purchased, as he pleases.—He may grumble, find fault, and abuse; because the rules of decency in this republic are equivocal; and there is no law to compel him to understand the object of his resentment.

He may, if he chuse, sell an author by weight to the cheefemonger; or consign his brains to this, or any other more base and ignoble fate, for depreciating, in his opinion, the value of the paper on which they are displayed.

This cannot be prevented.—For, in this republic, Tom Fool, and Tom-a-Bedlam, will contend, that Francis Bacon, and Isaac Newton, belong to the same God with themselves;—

felves;—and that to wage war against ignorance, is to invade their province and chartered privileges.—I accord.—Were it not so, I should have noticed one or two of these blundering, illiterate, purveyors of dullness, who took,—to the full extent of their rights,—liberties with the first edition of this publication.

Prompted by hunger, or directed by lunar influence, they acted, perhaps, against their conscience; or in an irresistible paroxysm of mental derangement.

Candour has, besides, another plea to advance in their favour.

On inquiry, I was informed who these desperate academicians were; and that they have a physical protection against any attempt to alienate their minds, from their ferocious customs.—Their skulls, like those of the Brazilian Indians, mentioned by PURCHAS, “are
“ as hard as the wood which grows in their
“ country,

SUGAR.

K, hand.	<i>Hindoostanee.</i>
سكّر, <i>Sukker, Sbukker.</i> Arabicè.	
شكر <i>Seker</i>	<i>Perficè, & Turcicè.</i>
Μελι καλαμινον.	THEOPHASTUS.
Σακχαρον.	DIOSCORIDES.
Saccaron.	PLINIUS.
Σακχαρι. Μελι καλαμινον.	ARRIANUS.
Σακχαρ.	GALENUS.
Αλς Ινδικος.	P. ÆGINETA, <i>ab</i> ARCHIGENE.
Saccharum.	<i>Latinè.</i>
Zuccharo.	<i>Italicè.</i>
Açúcar.	<i>Hispanicè.</i>
Sucre.	<i>Gallicè.</i>
Zúcker.	<i>Germanicè.</i>
Suycker.	<i>Belgicè.</i>

HISTORY
 OF THE
 SUGAR CANE.

I HAVE undertaken a difficult task, in attempting to give an History of SUGAR.

Much time has elapsed since the cultivation of the sugar cane has been generally known, and sugar in almost general use. Yet no person hitherto has connected any regular series of facts on the subject; a subject of the first importance in commerce: and, more than that, a subject now influencing the dispositions to health or disease, of the greater part of the inhabitants of the earth.

The materials which present themselves for my purpose, are disjointed and contradictory. The rays, which scarcely illumine the surface of the mass I am to penetrate, are feeble and confused. To discover a foundation, on which order and arrangement may rise, I must toil through trackless regions of obscurity.

The most antient author, who mentions the sugar cane, is THEOPHRASTUS, who lived 321 years before the Christian æra. I shall begin

with him ; and recite a few passages and allusions from other authors, as they descend in point of time, which have been supposed relative to this plant.

THEOPHRASTUS says, in his chapter on honey,—

ΟΤΙ ΑΙ ΤΟΥ ΜΕΛΙΤΟΣ ΓΕΝΕΣΕΙΣ, ΤΡΙΤΗΛΑΙ· Η ΑΠΟ ΤΩΝ
ΑΝΘΩΝ, ΚΑΙ ΕΝ ΟΙΣ ΑΛΛΟΙΣ ΕΣΤΙΝ Η ΓΛΥΚΥΛΗΣ· ΑΛΛΗ
ΔΕ ΕΚ ΤΟΥ ΑΕΡΟΣ, ΟΤΑΝ ΑΝΑΧΥΘΕΝ, ΥΓΡΟΝ ΑΠΟ ΤΟΥ
ΗΛΙΟΥ ΣΥΝΕΨΗΘΕΝ ΠΕΣΗ, ΓΙΝΕΤΑΙ ΔΕ ΤΟΥΤΟ ΜΑ-
ΛΙΣΤΑ ΥΠΟ ΠΥΡΑΜΗΛΟΝ· ΑΛΛΗ ΔΕ ΕΝ ΤΟΙΣ ΚΑΛΑΜΟΙΣ*.

“ The generation of honey is threefold : the first sort is from flowers, or other things in which there is sweetness : the second, from the air, which, when there are dews, is concocted by the heat of the sun, and falls particularly in harvest time : the third sort is from canes or reeds.”

He mentions that the second sort of honey, or that generated from the moisture in the air, falls on the earth, and on plants ; and is found chiefly on the boughs of the oak, and *Tilia*, or lime tree.

By the cane, which yields the third species of honey, it is supposed that he implies the sugar cane ; and the honey, the juice, perhaps inspissated, of that plant.

* Ed. HEINSII, 1613, p. 475.

THEOPHRASTUS mentions another sort of reed or cane, growing in marshy places in Egypt, with sweet roots. Speaking of the different properties of the different parts of plants, he says,—

—Καθαπερ εν Αιγυπτῳ του καλαμου του εν τοις ελεσιν· εχει μεν γαρ τινα γλυκυηηα και αλλως επι των ακρων, αλλ' επι βραχυ παντων. Εκεινος δε δια την ευηροφιαν απαλος γε επι πλειον εστι και γλυκυσ. Εχουσι δε και αι ριζαι την γλυκυηηα μεχρις ου αν ξηρανθωσιν. Αναξηρανθεισαι δε ουκ-εστι, το γαρ ξηρον, ουτ' εδωδιμον, ουτ' εσχυλον*.

“As in the reed that grows in moist places in Egypt; the extreme parts of which are also sweet, though in a small degree. But for the greater part, it is tender and sweet, on account of the copious nourishment diffused through it. Even the roots are sweet until they are dry; then they lose their sweetness, and are not proper for food, and are not favourable.”

Whether THEOPHRASTUS, who was a Lesbian, had ever seen this reed in Egypt with sweet roots, or whether he had the account of it from others, or whether such a reed really

* De Causis Plant. lib. VI. c. 16. ed. HEINSII.

exists, may be equally a matter of conjecture; but I have given his account of it, because other writers have mentioned this reed with sweet roots, probably from him: and many have supposed the *Sugar Cane* was the reed alluded to, though erroneously described. But this will be better understood by comparing this passage in THEOPHRASTUS, with what has been said by other early writers.

VARRO (68 years before the Christian æra), in the following verses, observes,—

*Indica non magna nimis arbore crescit arundo ;
Illius è lentis premitur radicibus humor,
Dulcia cui nequeant succo contendere mella*.*

“ The Indian reed does not grow to a large tree; from its viscid roots a liquor is pressed, to which honey cannot be compared for sweetness.”

DIONYSIUS AFER (*anno* 3. Ær. Chr. SAX. *Onomast.*) mentions that the Indians drink the juice of the *Ερυθραιος καλαμος*, or Indian cane †.

* VARRO Narbonensis, or, as he is sometimes called, VARRO *Atacinus*, a poetical writer, contemporary with the celebrated M. T. VARRO.

† *Periegesis*, viz. 1127.

STRABO (*anno* 19), in his 15th book of Geography, in the description of India, says, on the authority of NEARCHUS (Alexander's admiral), who lived 325 years before the Christian æra,—

Ειρηκε δε και περι των καλαμων οτι ποιουσι μελι μελισσων μη ουσων· ου γαρ δενδρον ειναι καρποφορον· εκ δε του καρπου μεθυειν*.

“ He (NEARCHUS) relates, that the reed (in India) yields honey without bees; but it is not a fruit-bearing tree: yet the *fruit* intoxicates.”

The latter part of this passage has perplexed commentators.—Would οποι remove the difficulty?

In the same page STRABO says, on the authority of ERATOSTHENES,—

Τας ριζας των φυων και μαλιστα των μεγαλων καλαμων, γλυκειας και φυσει και εψησει.

“ The roots of plants (in India), particularly of the great reeds, are sweet by nature, and by decoction.”

He also mentions the *καλαμος Ινδικος* growing abundantly in Æthiopia.

SENECA (*anno* 62) in his 84th Epistle, has the following passage:—

* P. 1016. edit. 1707.

Aiunt inveniri apud Indos mel in harundinum foliis ; quod aut ros illius cœli, aut ipsius harundinis humor dulcis, et pinguior gignat. In nostris quoque herbis vim eandem, sed minus manifestam, & notabilem poni ; quam prosequatur et contrahat animal huic rei genitum.

“ They say that, in the Indies, honey is found on the leaves of canes ; which is produced by the dew, or the sweet juice of the cane itself, concreting. In our herbs also there is the same quality, but in a less degree ; from which the bees extract honey.”

This, being in the time of NERO, proves that the Romans, at that period, knew but little of the sugar cane, and nothing of the manufacture of sugar.

LUCAN (*anno 62*) says, in the 237th verse of his third book, when speaking of the Indians near the Ganges,—

Quique bibunt tenera dulces ab arundine succos.

“ They drink the sweet juices of the tender reed.”

PLINY (*anno 78*) in the 32d chapter of the 6th book, speaking of the *Insulæ Fortunatæ*,
or

or what are now called the Canary Islands, asserts, on the authority of *Juba*, that, in the island called *Ombrios*,—

Arbores similes Ferulæ, ex quibus aqua exprimatur; ex nigris amara; ex candidioribus potui jucunda.

“There are trees resembling the *Ferula*, from which water may be expressed; the water from the black sort is bitter; but that from the white, grateful to drink.”

SALMASIUS, GEOFFROY, and many other authors, have believed that these trees, mentioned by PLINY, were sugar canes; but certainly without reason.

If we may credit the Spanish historian of these islands, there was in his time*, in the same island, now called *Ferro*†, or *Hierro*, a marvellous tree, which made up for the deficiency of springs, and contributed largely towards supplying the inhabitants of the island with water. Some writers consider PLINY'S remark applicable to this vegetable fountain, which is described as follows.

* In the year 1632.

† *Ferro* is about fifteen leagues in circumference, and five in breadth. It is subject to frequent droughts, there being only three inconsiderable springs in it.

“The

“ The district in which this tree stands is called *Tigulabe*, near to which, and in the cliff or steep rocky ascent that surrounds the whole island, is a narrow gutter or gully, which commences at the sea, and continues to the summit of the cliff, where it joins or coincides with a valley, which is terminated by the steep front of a rock. On the top of this rock grows a tree, now called *Til*, but, in the language of the antient inhabitants, *Garfe*, i. e. Sacred, or Holy Tree. Its leaves constantly distil such a quantity of water as is sufficient to furnish drink to every living creature in *Hierro*; Nature having provided this remedy for the drought of the island. On the North side of the trunk are two large tanks or cisterns of rough stone, or rather one cistern divided, each being twenty feet square, and sixteen spans in depth. One of these contains water for the drinking of the inhabitants, and the other that which they use for their cattle, washing, and such like purposes. Every morning, near this part of the island, a cloud or mist arises from the sea, which the South and Easterly winds force against the fore-mentioned steep cliff; so that the cloud, having no vent but by the gutter, gradually ascends it, and from thence advances slowly to the extremity of the valley, where

it is stopped and checked by the front of the rock which terminates the valley, and then rests upon the thick leaves and wide-spreading branches of the tree, from whence it distils in drops during the remainder of the day, until it is at length exhausted, in the same manner that we see water drip from the leaves of trees after a heavy shower of rain.

“This distillation is not peculiar to the *Garfe*, or *Til*; for the *Bresos*, which grow near it, likewise drop water; but, their leaves being but few and narrow, the quantity is so trifling, that though the natives save some of it, yet they make little or no account of any but what distils from the *Til*.

“A person lives on the spot near which this tree grows, who is appointed by the council to take care of it and its water. He every day distributes to each family of the district seven pots or vessels full of water, besides what he gives to the principal people of the island*.”

That some trees and shrubs may, on hydraulic principles, become syphons to the earth, and their extremities discharge a considerable quantity of water imbibed from the roots, is certainly possible; and such trees are related

* GLASS's History of the Canary Islands, p. 275, anno 1764.

by travellers to exist in Africa, and South America. But the history of the *Garse* is scarcely within the compass of credibility. There may be some trees peculiar to *Ferro*, abounding with moisture, which PLINY had heard of; and, on that account, I have introduced the preceding relation. Indeed, they are mentioned by several subsequent writers; particularly by PETER MARTYR, who says, “In the island of *Ferro* there is no other water that may be drunk, but only that is gathered of the dew which continually distilleth from one only tree, growing on the highest bank of the island, and falleth into a round trench made with man’s hand.” *Decad. I. Lib. I. anno 1493.*

STATIUS (*anno 95*), *Sylvarum, Lib. 1. sub finem*, has a passage, which has been the foundation of much dispute among critics and commentators; some contending that the reading should be *cannæ*, canes; others, that it should be *caunæ*, figs: so called from *Caunus*, a town in Egypt, famous for figs.

Et quas percoquit Ebusia cannas *.

“The island of *Ebusus* (or *Ivica*, in the Mediterranean, near Valencia in Spain), which produces ripe canes.”

* *Et quod præcoquit Ebusia cannas.* Ed. Veneta, 1475.

Et quas percoquit Ebofea caunas.

“Ebufus which ripens (*caunæ*) figs.”

SOLINUS (*anno* 218), in the 52d chapter of his Polyhistoria, in describing India, fays,—

Quæ palustria sunt, arundinem creant ita crassam, ut fissis internodiis lembi vice veētitet navigantes; è radicibus ejus exprimitur humor dulcis ad melleam suavitatem.*

“The marshy places produce reeds so large, that between the joints, when divided in the middle, they are capable of carrying people in the manner of boats; from the roots of this reed a juice is expressed as sweet as honey.”

SOLINUS has taken the first part of this passage from PLINY; who, as well as HERODOTUS, fays, that the Indians make boats, or canoes, from canes growing in marshy places: but neither HERODOTUS nor PLINY mention the sweetness of their roots.

HERODOTUS, 444 years before the Christian æra, in his *Thalia*, fays the Indians, who inhabit the morasses of the river, feed on raw fish, which they catch in boats made of reeds; a single joint of which is large enough for one boat: and PLINY, in the 2d chapter

* P. 275, edit. Goezii, 1777.

of his 7th book, says, in India the canes grow to so great a size, that, from a single joint, a boat may be made capable of carrying three people.

I have now selected every thing, excepting the trivial common-place matter (which may be found in almost every Lexicon), respecting the *cane*, or *reed*, to which the property of *sweetness* has been attributed, by every writer preceding the reign of priestcraft, ignorance, and oblivion. I shall pass over that long night of human reason, where nothing is to be found,—to the more certain and determinate history of the sugar cane.

On the discovery of the Western hemisphere, the Sugar Cane was found on the continent; and also in some of the Atlantic islands; but the art of making sugar, it is said, never was practised by the aborigines of the West Indian islands, until they were settled by Europeans; nor by the Mexicans, or Peruvians, or any other native inhabitants of South America, previous to their subjugation by the Spaniards.

Of this there may be some doubt, with respect to Mexico; but not as to any other part of the continent, or any of the islands.

Before

Before the discovery of the West Indies, by the Spaniards, in 1492; before the discovery of the East Indies, by the Portuguese navigators, in 1497; and before the discovery of the Brazils, by the same nation, in 1500, abundance of sugar was made in the islands of Sicily, Crete, Rhodes, and Cyprus.

The sugar cane is supposed to have been brought to these islands originally, from India, by the Saracens; and from thence transplanted into some parts of Italy; and to Spain, from Africa, by the Moors.

In Spain, the sugar cane was first planted in Valencia, and afterwards in Granada, and Murcia. Sugar was formerly, in these Southern parts of Spain, produced in great quantity; and some is still made in the two latter provinces.

The celebrated Mr. FRANCIS WILLOUGHBY, who entered Spain from Roussillon, and travelled through great part of it in 1664, says, “at Cullura the wine first begun to be sweet; and three leagues off, at Gandia, in Valencia, the plantations of sugar canes began. *Quere*, whether the nature of the soil, that was fit to nourish the sugar canes, did not also contribute to the nature of the grapes?

“At Gandia we first found raisins of the sun, as they are called in England; in Spain
C. they

they call this kind *pansas*, and they seem to be the *duracinæ* of the antients. They are all white, round, and have a tougher skin than other grapes. They gather them when fully ripe, and dip them in a boiling lixivium of water and ashes, just dipping them in, and taking them out again; and then dry them upon boards in the sun, taking them in by night, or in foul weather. The name raisin comes from *racemus*. Figs are dried just as they are gathered, not being dipped in any lixivium.

“ I went to Olives, in Valencia also, where, and at Gandia, are the engines for sugar-works; the best are at Olives. By the way we saw the sugar canes growing in several places. They are planted in low wet grounds, well mucked and dressed, divided into beds or hillocks, and furrows. They cut the canes close to the roots in November and December, and, cutting off the slender tops, which afford no good juice, keep them under ground till March, and then prick them into these hillocks or beds; out of every *talea*, or cut, shoot four, five, or six, canes, which will be ripe next December. The knots, or joints of the cane at the bottom, are very close together, scarce an inch asunder; but upwards the distance is more, as
the

the cane grows more slender. Within is a white pulp, or pith, full of sap, sweet as honey. They sell them at Gandia to eat, and, cutting them in pieces just in the middle between two knots, suck the pieces at both ends. To make sugar, after the canes are cleaned from the tops and leaves, and cut to pieces, they are first bruised, either with a perpendicular stone running round, as apples to make cyder, or olives to make oil; or between two axes strongly capped with iron, horizontally placed, and turned contrary ways; and then pressed as grapes or olives are. The juice thus pressed out is boiled in three several cauldrons, one after another. In the third cauldron it becomes thick and black, and is then put into conical pots, which at the bottom have a little hole stopped only with coarse and foul sugar. These pots are covered when full with a cake of paste, made of a kind of earth called the Spanish *gritty*, and found near Olives, which is good to take spots out of clothes, which cap or cover sinks as the sugar sinks. These conical pots are put into other pots, into which, by the hole at the vertex, the juice drains down through the coarse sugar at the bottom. It drains for five or six months, in which time the sugar in the conical pots

grows hard, and white, all the juice being drunk up by the lute, or run out by the hole in the vertex. The juice is boiled again, so long as it is good for any thing; but at last it makes only a foul red sugar, that will never be better. The conical loaves of sugar, after they are taken out, are set to drain over the same pots for 14 or 15 days. To make the sugar more white, they must boil it again, but about one-sixth is lost every time. A pound of sugar of 12 ounces is sold at Olives for three *sous* and an half; refined, for five or six *sous*. The sugar juice is strained through strainers of linen, and is put out of one cauldron into another. They take it out of the first and second cauldrons so soon as it begins to boil; but in the third cauldron they let it boil till the scum rises, and then take off only the scum with the scummer, and put it into a long trough, to cool; and, when it is cool, put it into the conical pots. One scum rises after another in the third cauldron. The scum, when it is taken off, is white, but turns to a black liquor in the trough. They never refine the sugar more than three or four times. They use for the refining of it whites of eggs, putting in two or three dozen into a cauldron. They use but one cauldron for refining. When it is refined, it
grows

grows hard and white in nine or ten days. When they refine it, they put a little water into the cauldron, to dissolve it the better*.”

From Valencia, the cultivation of the sugar cane, and the manufacture of sugar, were carried in the beginning of the 15th century, by the Spaniards, to the Canary islands, and the commerce arising from the sugar there produced was considerable: but, prior to this period, the Portuguese, in 1420, carried the cane, and the manufacture of sugar, from the island of Sicily to Madeira. From these origins the cultivation of the sugar cane, and the art of making sugar, were extended by different nations of Europeans to the West Indian islands, and the Brazils.

Though the Canary islands, or *Insulæ Fortunatæ*, were known to the antients; yet, after the fall of the Roman empire, many centuries elapsed in which all intercourse, mention, and even knowledge of these islands, were buried in oblivion; and they remained as sunk from the world until about the year 1330, when a French vessel was forced on one of them in a violent gale of wind. After this accident they became known again in Europe.

* RAY'S Travels, ed. 1737, vol. I. p. 409.

The conquest of these islands was undertaken by the Spaniards in 1393. The Portuguese indeed had made some slight attempts in 1334; but, being repulsed at *Gomero* by the natives, they relinquished the enterprize.

The first of these islands that was conquered was *Lancerata* in 1400; *Fuerventura* was captured in 1405; *Canaria*, in 1483; *Palma*, in 1491; *Teneriff*, in 1495.

The island of *Madeira* is supposed, like the Canary islands, to have been known to the ancients; and, like them, to have been lost in the same interval of darkness, until the year 1344; when an English vessel was driven on this island by a storm. But this event was not succeeded by any intercourse with the island, and seems to have been forgotten, as no notice was taken of it until 1419, when it was again discovered by the Portuguese; who, in the following year, 1420, took possession of it. It was then a mere wilderness, as its name imports*, and unpeopled. The Portuguese burnt the woods, and made a settlement; and, in the same year, planted the sugar cane there, which they brought from the island of Sicily.

* *Maderia*. Nomen factum est à Lat. *materia*, quâ tam in vulgatâ Bibliorum versione quam alibi significatur idem quòd Anglicè *timber*; quia tali materiâ abundabat ista insula. HYDII, not. in PERITSOL. Itin. p. 113.

From the incorrect accounts of the first West Indian discoveries, it is impossible to ascertain in which of the islands the cane was found, and in which it was not. We know it was seen in some of them: but, from modern navigators, we have proofs that it grows spontaneously in all the islands in the South Sea.

It was found in great abundance in all the Society islands, Easter island, and the Sandwich isles; where the Indians are perfectly acquainted with the use of its expressed juice, but have not the knowledge of making sugar.

Some plants of these canes have lately been introduced into the West Indies; and the astonishing increase of sugar, which those brought from Otaheite and planted in Jamaica yield over those of the island, shews, if there be not different species,—that vegetables, as well as animals, may degenerate, and require the impulse of change to incite, or re-animate their vigour.

Thus the breed of cattle, and thus also the improved husbandry in Europe in general, are carried on; grain, seeds, and plants, are removed from place to place, and varied, and cultivated, on physical principles, by philosophers.

In England, the Duke of BEDFORD, and Mr. COKE, have distinguished themselves in this kind of knowledge; and have rendered the most essential services to their country.

This should be a lesson to the planter of the sugar cane, not to continue propagating from the same stock; or at least to try the effects, where any degeneracy appears, of new plants from another island; or from remote parts of the same island, where the former cannot be obtained.

Whether there be different species of the sugar cane, or whether the varieties, with which we have been lately made acquainted, are owing to some local causes, has not yet been ascertained.

The French, a few years since, introduced into their West Indian islands plants from the East Indies. From their islands the cultivation of the East Indian cane has been carried into some of the English islands. Sir JOHN LAFOREY planted them in Antigua, and has proved their present superiority over the old canes of the West Indies. He gives the following account of these canes:

“ One sort brought from the island of Bourbon, reported by the French to be the growth of the coast of Malabar.

“ Another

“ Another sort from the island of Otaheite.

“ Another sort from Batavia. ‘

“ The two former are much alike, both in their appearance and growth; but that of Otaheite is said to make the finest sugar. They are much larger than those of our islands, the joints of some measuring eight or nine inches long, and six in circumference.

“ Their colour, and that of their leaves, also differs from ours.

“ They are ripe enough to grind, at the age of ten months.

“ They appear to stand the dry weather better than ours; and are not liable to be attacked by that destructive insect called the *borer*.

“ The Batavian canes are a deep purple on the outside; they grow short-jointed, and small in circumference: but bunch exceedingly, and vegetate so quick, that they spring up from the plant in one third of the time which those of our island do*.”

The method of propagating the sugar cane is by cuttings from the top of it, and we know

* Sir John LAFOREY's remarks on the East Indian canes, imported into the French Charaibbean islands, in Mr. EDWARDS's preface to the second edition of his History of the West Indies.

of no other method; though Mr. BRUCE says, in Abyssinia it is raised from the seed. Of this fact we have no example; and it is thought that Mr. BRUCE is mistaken in this matter.

The progress of cultivating the cane for the purposes of making sugar, has given rise to the erroneous supposition, that the migration of the sugar cane, under the Europeans, was from Sicily and Spain, to the Madeira and Canary islands; and afterwards to the West Indian islands, Mexico, Peru, and Brazil: and that it was not an original plant of those islands, and countries.

There is, besides, great difficulty in distinguishing, in the journals of voyagers, between the history of the plant and its produce. For, often when some particular period is mentioned, when the sugar cane was first carried to countries, the fact is, that such period was the time when the cultivation of the plant, for the purposes of making sugar, was introduced; which before was either entirely neglected, or the use of the simple juice only known: and frequently mention is made when sugar was first produced in some countries, which in reality was the period when the European art of refining it, or some improvements in its manufacture, was carried thither.

It

It is certain, that the sugar cane was found growing in the low, rich lands near the mouth of the Mississippi, when Europeans first went to that part of America.

Father HENNEPIN says, "from thirty leagues below *Maroa*, down to the sea, the banks of the Mississippi are full of canes." This was in 1680, when he was there. He was the first European who explored the country adjacent to the lower parts of that river.

FRANCIS XIMENES, in his treatise on the plants of America, says, the sugar cane grows spontaneously near the *Rio della Plata*; this is also asserted by HERNANDES and PISO. This river was discovered in 1515, by JOHN DIAS DE SOLIS, a Spaniard; and the country about it conquered by PEDRO DE MENDOZA, in 1535.

JEAN DE LERY, who went in 1556 to the *Rio Janeiro*, in Brazil, says, he found every where near that river a great quantity of sugar canes; and it is certain that they could not have been planted by the Portuguese, as they were not settled in those parts until long afterwards.

JOHN DE LAET says, the island of St. Vincent produced the sugar cane spontaneously.
Lib. I. pag. 27.

LABAT says, the first French settlers in St. Christopher, Martinique, and Guadaloupe, found sugar canes in different parts of those islands; which, growing there naturally, were afterwards properly cultivated, and have since produced all the Sugar of those islands. Vol. II. p. 226.

The island of St. Christopher was first taken possession of by the French and English, on the same day, in the year 1625. The English made sugar there in 1643, and the French soon after. From this island the French sent a colony to take possession of Martinique; and they settled there in 1635.

In 1627, the English settled at Barbadoes; and, in 1643, made Sugar there. In 1676 it was in its most flourishing state, and employed four hundred sail of vessels, which were on an average of 150 tons*.

In 1628, the English settled at Nevis.

In 1632, the English settled at Montserrat; and, in the same year, the Dutch settled at St. Eustatia.

In 1635, the French settled at Guadaloupe; and, in 1648, made sugar there.

In 1650, the French settled at Granada.

* CHARLES II. in 1661, created thirteen Baronets of Barbadoes; each of whom had in the island not less than a thousand pounds a-year, and some ten thousand pounds a-year. POSTELTHWAITE.

Jamaica was discovered by COLUMBUS in 1494, in his second voyage; and bestowed on him by Ferdinand and Isabella, as some compensation for the acquisitions he had given to Spain in the West Indies.

His son *James* settled, and planted it in 1509. What improvements it received by the Spaniards, during the time they were in possession of it, are but little known. They continued there however undisturbed until 1596; when Sir ANTHONY SHIRLEY, with a single man of war, took and plundered St. Jago de la Vega; which then consisted of 2000 houses. In the year 1635, this town was again plundered by 500 English from the Leeward islands. In 1656, on the 10th of May, the whole island was reduced, and taken possession of by the forces sent against it by OLIVER CROMWELL; and has since that time belonged to the English.

At this conquest of Jamaica, there were not more than 1500 Spaniards, with about the same number of slaves, in the island. The Spaniards had exterminated all the native Indian inhabitants; not one was seen by the English, out of 60,000 which the Spaniards found there.

The sugar cane was first planted there, by the English, in 1660; and sugar first made in

1664.

1664. But some plantations were made there while it was in possession of the Spaniards, by ESQUIMEL, a Spanish governor, under DIEGO COLUMBUS, son of the renowned COLUMBUS; who brought the plants from St. Domingue. There were in Jamaica, on the arrival of the English, only three small plantations in the island; the chief of which was at the *Angels*.

Sir THOMAS MODYFORD, a rich and eminent planter of Barbadoes, was the person who first planted and cultivated the sugar cane, for the purpose of making sugar, in Jamaica. This was in 1660. He removed from Barbadoes to Jamaica, and carried with him much agricultural knowledge, to the great advantage of the island; which he contributed to improve and benefit, in a very extensive manner. CHARLES the second appointed him governor of the island in 1664; in which situation he continued until 1669.

In the island of St. Thomas, under the line, on the coast of Africa, which was discovered by the Portuguese in 1405, sugar was made much earlier than in the West Indies.

DAPPER says (page 491) that the Portuguese had sixty-one sugar works in this island, before the Dutch destroyed them in the year 1610.

HEYLIN,

HEYLIN, who published the first edition of his *Cosmography* in 1624, says "this island is so abundant in sugar canes, and well stored with sugars, that forty ships are hence loaded yearly with that one commodity; for making which they have here seventy *ingenios*, or sugar houses, and in each of them two hundred slaves, in some three hundred, which belong to the works. Six days in seven these slaves work for their masters, and the seventh for themselves; which they spend in sowing and planting their seeds, fruits, and provisions. They bring the negroes from the opposite continent, with whom the air agrees so well, that they attain generally to 110 years; few of the Portugals unto 50. The air is so vehemently hot that it suiteth not with the constitution of the Europeans."

LABAT, Vol. I. pag. 226. is decidedly of opinion, that the sugar cane is a native plant of the West Indies. But he says, that it is to the Portugese and Spaniards that Europeans are indebted for the art of making sugar; who learned the secret from the inhabitants of the East Indies, and returning from thence put it in practice, first at the island of Madeira and the Canaries, and afterwards in the Brazils, and New Spain, about the end of the year 1580.

That

That the fugar cane is a native plant of the West Indies there can be no doubt; but in the other remarks, LABAT is mistaken, as has already appeared; for the Portuguese had not passed the Cape of Good Hope until 1497; long before which time fugar was made in the Mediterranean Islands. Besides, according to PETER MARTYR, in the year 1518, there were twenty-eight fugar-works in the island of Hispaniola, established by the Spaniards. He says, "it is a marvellous thing to consider how all things increase and prosper in this island. There are now twenty-eight fugar-presses, wherewith great plenty of fugar is made. The canes or reeds wherein the fugar groweth are bigger and higher than in any other place; and are as big as a man's wrist, and higher than the stature of a man by the half. This is more wonderful, that whereas in Valencia, in Spain, where a great quantity of Sugar is made yearly, whensoever they apply themselves to the great increase thereof, yet doth every root bring forth not past five, or six, or at the most seven, of those reeds; whereas in Hispaniola one root beareth twenty, and oftentimes thirty*." English edit. 1577, page 172. The original edition was published in Spain, in 1530.

* This justifies the supposition, that the fugar cane in the West Indies has degenerated. See page 23.

COLUMBUS, in his first voyage in 1492, discovered the island of Hispaniola, or *Saint Domingue*; and ANTONIO HERRARA, in the second book of his second Decad, speaking of the improvements and cultivation carried to that island by the Jeronimite friers, says, “One AQUILON, an inhabitant of the great plain, carried thither, in the year 1506, some sugar canes from the Canaries, and planted them; the same answering well, the fathers ordered that every inhabitant, who would erect a sugar mill, should have five hundred pieces of eight in gold lent him; and, by this contrivance, in a short space of time there came to be forty either Water or Horse sugar Mills in the island. It is to be observed, that formerly sugar grew only in Valencia, whence it was conveyed to Grenada, thence to the Canaries, and lastly to the Indies*, which made it more necessary to send over blacks; and that put the Portuguese upon carrying many from Guinea. Hispaniola proved so natural to the blacks, as to have it once said that, unless one happened to be hanged, none ever died †.”

* This must refer only to the manufacturing of sugar. PISO says the sugar canes were originally found growing wild in the woods in the Canary Islands. Lib. 4. Cap. 1.

† HERRARA says, the Spaniards first imported their negroes from the Portuguese, who had settlements on the coast of Africa.

In 1726, the French made in this island 33,000 hogheads of sugar, of 12 hundred weight each. In 1742, they made 70,666 hogheads; and, in the same year also, they made in Martinique, Guadaloupe, and the other lesser isles, 51,875 hogheads.

The whole produce of the British West Indian Islands, imported into Great Britain that year, was 60,950 hogheads. In 1770, St. Domingue yielded of sugar, two-thirds brown, 160,000 hogheads, of 10 hundred weight each.

GONZALES FERDINANDUS OVIEDUS, who lived in Hispaniola in 1515, and was governor of the city of *Sancta Maria* in Darien in 1522, says, p. 225 of the Summary of his General History of the West Indies, "there is such abundance of sugar in Mexico, that certain Spanish ships are yearly freighted therewith, and bring the same unto Seville, in Spain; from whence it is carried to all parts of Christendom."

As Mexico was not entirely conquered by the Spaniards until 1521, I think it is clear that the sugar cane must have been cultivated, and sugar made in Mexico, before the Spaniards went thither.

PETER

PETER CIEZA, who travelled from the year 1533 to 1550, in Peru, and other parts of South America, says, cap. 64, p. 167, "In several parts of the vales, near the city of St. Michael, there are large fields of fugar canes, whereof fugar is made in several towns and preserves."

He mentions this among other articles of the agriculture of the Indians, before the Spaniards went among them; for, though VASCO NUNEZ DE BALBOA crossed to the South Sea, and settled at Panama in 1513, yet the Spaniards were never in any part of Peru before the year 1525; and then PIZARRO, with a few adventurers, only landed, and made some discoveries, but returned to Spain in 1528, for authority to undertake the conquest of Peru; which was not begun in South America until 1530, and completed in 1532, by the murder of the last Inca, Atabalipa; or, as the Spaniards write the name, *Atahuallpa*: yet Spain was not in peaceable possession of Peru before 1554.

This immense scene of blood was not closed by the Spaniards, without many tragical events among themselves. ALMAGRO, the conqueror of Chili, was strangled before Cusco by HERNAND PIZARRO in 1538; and FRANCIS PIZARRO,

the conqueror of Peru, was assassinated at Lima in 1541, by the partizans of ALMAGRO.

CIEZA mentions also the manner in which the Indians carry water in trenches, from the rivers descending from the mountains, through the fields in the plains; to supply the defect of rain in those countries.

This part of Peru was then inhabited entirely by Indians; for, though *St. Michael* was the first city built by the Spaniards in Peru, it was not founded until 1541, by PIZARRO, before the capture of *Atabalipa*; and, consequently, before the wars were ended, or that the Spaniards had turned their thoughts to agriculture. Wherefore, it is probable that the art of making sugar was known to the Peruvian Indians also, before the Spaniards went among them.

It is certain that GARCILASSO DE LA VEGA, who was a native of Peru, and left that country and went to Spain in the year 1560, says, in his Commentaries, lib. IX. cap. 28, part 1, that “ antiently there were no sugar canes in Peru, though now, by the industry of the Spaniards, and the fertility of the soil, they are increased to a loathsome plenty; that, whereas formerly they were highly esteemed, and are now become of no value or estimation.”

“ The

“ The first Sugar Works in Peru were made in *Huanca*, by the contrivance of a gentleman with whom I was well acquainted. A servant of his, who was a subtile and ingenious person, observing the great quantities of sugar which were imported from Mexico, by reason of which the sugar of Peru would not sell to any account, advised his master to send one ship's lading of his sugar to Mexico; that they, seeing thereby the plenty of that commodity in Peru, might forbear to send any more thither. The project succeeded according to expectation; and now sugar works are erected in many places in that country.”

JOSEPH ACOSTA, who was in South America about the year 1580, says, in his Natural and Moral History of the Indies, lib. IV. cap. 32, “ that they not only use a great deal of sugar in the Indies, but also carry much into Spain; for, the canes grow exceedingly well in many parts of the Indies. They have built their engines in the islands, in Mexico, in Peru, and in other parts; which yieldeth the Spaniards a very great revenue.”

“ It was told me, that the engine for making sugar in *Nasca*, in Peru, was worth yearly above thirty thousand pieces of revenue. That of *Chicama*, joining to *Truxillo*, in the

same country, was likewise of great revenue, and those of New Spain are of no less: and it is strange to see what store they consume at the Indies. They brought from the island of *Saint Domingue*, in the fleet wherein I came, 898 chests of sugar, which being, as I did see, shipped at *Porto Rico*, every chest, in my opinion, weighed eight *arobes*, every *arobes* weighing five and twenty pounds, which are two hundred weight of sugar. This is the chief revenue of these islands, so much are men given to sweet things."

THOMAS GAGE, who went to New Spain in 1625, says (p. 236), in the voyage the Spanish fleet, in which he was, touched at the island of *Guadaloupe*; "where the Indians with great joy yearly expect the Spanish fleets; and by the moons reckon the months, and thereby guess at their coming; and some prepare sugar canes, others plantains, others turtles, some one provision, some another, to barter with the Spaniards for their small haberdashery, iron, knives, and such things which may help them in their wars, which commonly they make against some other islands."

This was ten years before any Europeans had settled there; and where no sugar was made until 1648, by the French, who then
possessed

possessed it. The sugar cane, consequently, was the natural production of that Island.

GAGE says, cap. 15, "two or three leagues from the Indian town of *Chiapa* there are (in 1626) two Ingenios or Farms of sugar, one belonging to the cloister of the Dominicans of the Spanish city of *Chiapa*, which is twelve leagues from this town, the other to the cloister of this town, which contain near two hundred Black-Moors, besides many Indians, who are employed in that constant work of making sugar for all the country."

He also remarks, in the same chapter, that sugar was an article of commerce, and sent from *Chiapa* down the river *Tabasco*, to be transported to the Havannah. The towns of *Chiapa* are in the province of *Chiapa*, which joins to *Guatemala*.

The Portuguese first established Sugar Works in the Brazils, in 1580. They had no settlement of consequence there before 1549. The Dutch, after the truce between Spain and Holland in 1562, began their expeditions to the Brazils; and in 1637 they sent Count MAURICE thither. In 1641, when the treaty of peace was concluded between the Dutch and Portuguese, the former were in number 20,000, and had acquired seven of the fourteen captain-

ships of Brazil. They had 60,000 negroes there, and made 25,000 chests of sugar. But, in 1655, they were dispossessed of their territories, and ceded them by treaty, in 1661, to the Portuguese; being reduced in number, by wars and other disasters, to only six or seven hundred persons. It was these Dutch fugitives, driven from the Brazils in 1655, that carried the art of planting the cane, and making sugar in a proper manner, to the West Indian Islands.

I have before observed, that the island of Barbadoes was first settled by the English in 1627, and sugar made there in 1643. I shall now add some particulars from LIGON, which will illustrate the subject in a very satisfactory manner.

He says, in his History of Barbadoes, p. 85, "At the time we landed on this island, which was in the beginning of September, 1647, we were informed, partly by those planters we found there, and partly by our own observations, that the great work of sugar-making was but newly practised by the inhabitants there. Some of the most industrious men, having gotten plants from *Fernambrock*, a place in Brazil, and made trial of them at the Barbadoes, and finding them to grow, they
planted

planted more and more, as they grew and multiplied on the place, till they had such a considerable number as they were worth the while to set up a very small Ingenio, and so make trial what sugar could be made on that soil. But the secrets of the work being not well understood, the sugars they made were very inconsiderable, and little worth, for two or three years. But they, finding their errors by their daily practice, began a little to mend; and, by new directions from Brazil, sometimes by strangers, and now and then by their own people, who were content sometimes to make a voyage thither, to improve their knowledge in a thing they so much desired. Being now much better able to make their queries, of the secrets of that mystery, by how much their often-failings had put them to often-stops and nonplusses in the work. And so returning with more plants, and better knowledge, they went on upon fresh hopes, but still short of what they should be more skilful in; for, at our first arrival, we found them ignorant in three main points that much conduced to the work; *viz.* the manner of planting; the time of gathering; and the right placing their coppers in their furnaces; as also the true way of covering their rollers with plates or bars of iron.

iron. At the time of our arrival there we found many sugar works set up, and at work; but yet the sugars they made were but bare Muscovadoes; and few of them merchantable commodities; so moist, and full of molasses, and so ill cured, as they were hardly worth bringing home to England. But about the time I left the island, which was in 1650, they were much bettered; for then they had skill to know when the canes were ripe, which was not till they were fifteen months old; and before they gathered them at twelve, which was a main disadvantage to the making good sugar; for, the liquor wanting of the sweetness it ought to have, caused the sugars to be lean, and unfit to keep. Besides, they had grown greater proficients both in boiling and curing them, and had learnt the knowledge of making them white, such as you call lump-sugars here in England; but not so excellent as those they make in Brazil; nor is there any likelihood they can ever make such; the land there being better, and lying in a continent, must needs have constant and steadier weather, and the air much drier and purer than it can be in so small an island as that of Barbadoes."

H I S T O R Y
 OF
 S U G A R.

SUGAR was first brought into Europe from Arabia and the East. What kind or species of sugar this was, or whether any of the various preparations of it now in use, has been a subject of much controversy in antiquarian literature.

The profoundly learned SALMASIUS (SAUMAISE, his proper name), who went to reside at Leyden in 1632, asserts, that what authors denominate the *sacar mambu* of the Indians, was the *σακχαρον*, or sugar, of the ancients.

By the term ancients, in this treatise, the Greeks and Romans of the earlier periods are not meant. To them the word sugar was unknown.

He

He says,—*Exercitationes nostræ docent illud σακχαρον esse quod hoc tempore vocatur apud Indos Sacar-Mambu; quod in arundine Indica arboreæ ac vastæ proceritatis sponte crescit. De Saccharo Commentarius.*

He also says, this *sacar-mambu* of the Indians was the *tabaxir* of the Arabians; but that the Arabians were ignorant how it was produced, as were the ancient Greeks of the *generatio Mellis Calamini, sive σακχαρον*; who thought it was the dew, which, falling on the Indian canes, concreted: and that it was a kind of manna.

The Arabians, he observes, supposed the *tabaxir* to be the ashes of the cane; and certainly, he says, this species of sugar, when concreted and coagulated, is like ashes; but, when issuing from the joints of the cane, it is white like starch. The ancients remark also, that their sugar was brittle between the teeth; therefore many of them call it *Indian salt*; whereas our sugar, he says, melts in the mouth, and is not brittle*.

He contends, that the Arabians were in an error respecting their *tabaxir*; and that it was not the ashes of the cane, but the *sacar-mambu*

* *Exercitationes Plinianæ.*

of the Indians, and the real *μελι καλαμινον* of the Greeks. He says the antients gave it the appellation of *fugar*, which the Arabians did not; because they believed it to be ashes, and not a species of *fugar* which was called by them *zuchar*.

He says the cane, from which the fictitious *fugar* now in use is made, is a small plant; but that in the Indies, which yields the *sacar-mambu* of the Indians, the *tabaxir* of the Arabians, or native *fugar* of the antients, is a large tree; and that this species of *fugar* is the concreted exudation from the tree, found about the joints.

SALMASIUS at length attempts, as a farther corroboration of his opinion, to shew, that the virtues attributed by the Arabians to the *tabaxir*, coincide with those which the Greeks ascribed to their *σακχαρον*.

In these conjectures, I believe, it will appear that the most learned SALMASIUS is mistaken; and that the *tabaxir*, or, as it has been variously rendered by translators, *thabafir*, *tarathbit*, *sataiscir*, *tabafis*, *tabafir*, and *sabascir*, of RHASIS, AVICENNA, SERAPION, and AVERROES, was neither the *sacar-mambu* of the Indians, nor the *σακχαρον* of the antients.

Let

Let us examine what may be collected from the Arabians themselves, concerning their *tabaxir*.

RHASES (anno 930) says,—

Tarathit, id est Spodium, frigida est & sicca, quæ & ventrem stringit, & sanguinem exire prohibet. Spodium frigidum est & siccum, quod febribus acutis, ac siti, & nimio ventris fluxui, & vomitui, confert: pustulis quoque quæ in ore & lingua nascuntur, atque tremori cordis, auxiliatur. De Simplicibus, cap. 36.

AVICENNA (anno 1040) says,—*Thabafir (the translator calls it Spodium) quid est? Cannarum adustæ; dicitur enim quod ipsæ aduruntur propter fricationem suarum extremitatum, quum ventus eas perflat. Frigidum est in secundo, & siccum in tertio. In ipso est stipticitas, & præparatio & parum resolutionis, & ejus infrigidatio est plurima, & ejus resolutio est propter amaritudinem paucam in ipso. Ex resolutione igitur ejus, & stipticitate, fit exsiccatio fortis, & est compositarum virtutum sicut rosa. Confert aphthis, & melancholiæ provenienti solitudine. Spodium (Tabaxir) confert apostematibus oculi calidis, confortat cor, et confert tremori ejus calido, & syncopi factæ ex effusione cholæræ ad stomachum, & bibitum, & linitum, & confert melancholiæ ex solitudine, &*
timori

timori de præteritis, & terrori de futuris. Confert tussi (siti) & inflammationi stomachi, & debilitati ejus, & prohibet effusionem cholerae ad ipsum, & confert conturbationi. Prohibet solutionem cholericam. Confert febribus acutis. Lib. II. tract. 2. cap. 616. Ed. Venetiis, 1595.

SERAPION (anno 1070) says, adducing his authorities,—

Sataiscir, vel Rescius, id est Spodium.

BEDIGORES,—*Proprietatis spodii est, quod confert caliditati cholerae.*

RHASES, ex verbo GALENI,—*In spodio est resolutio, & prohibitio, & repercussio, & infrigidatio, sed infrigidatio ejus est fortior, & in sapore ejus est amaritudo, & stipticitas, & propter hoc desiccatur. Et jam est declaratum, quod in spodio est virtus composita, sicut rosa, & non est in spodio tantum stipticitas, quantum in rosa.*

DIOSCORIDES,—*Spodium confert apostematibus calidis oculorum.*

MESEAH,—*Spodium est frigidum in tertio gradu, siccum in secundo, confert inflationi cholerae, & fortificat stomachum, et confert ulceribus oris.*

MESARUGIE,—*Est bonum cholerae, & syncopi, et bother (pustulis) factis in ore puerorum.*

RHASES,—

RHASES,—*Spodium est frigidum et siccum in tertio gradu, stringit ventrem, et confert ulceribus oris, et inflationi cholerae, et fortificat stomachum, et confert syncopi, et cardiacae calidae quando datur in potu ex eo, et confert bother (pustulis) frigidis in ore infantium.* De Temperamentis, Simplicium, cap. 332.

AVERROES, (anno 1198) says,

Tabaisis, id est spodium, carbo est nodorum arundinum adustarum Indiae: frigidum est & siccum in tertio gradu, et ejus proprietas est remove caliditatem et inflammationem cholerae, et confortat stomachum, et confert cardiacae calidae. De Simplicibus, cap. 56.

Now it is evident, from the testimony of the preceding authors, that the Arabians ascribed no property whatever to their *tabaxir*, which is any way applicable to sugar. The great feature of its character, *sweetness*, is not once mentioned.

The translators, as their originals before them, had considered the *tabaxir* to be the ashes of the Indian canes; or of their joints, or roots: and being of a greyish colour, like *spodium*, (*pompholix*, *tutty*, *putty*) rendered the word *tabaxir*, by that appellation, from *σποδος*, ashes. But as it was given internally, it certainly

tainly could not be the *σποδος* of the Greeks ; which was the *fordes*, or recrement of melting brafs : and never employed by them but for external purpofes.

SALMASIUS, whose great erudition and extensive knowledge have been the admiration of the learned in every country, never felected a fubject for his animadverfions, with which he appears to have been fo little acquainted as the prefent. He conceals, beneath a dazzling difplay of learning, the imperfect knowledge he had of the hiftory of fugar : taken chiefly from uninformed travellers, and particularly from GARCIAS ab *Orta*, in refpect to the *tabaxir*.

GARCIAS, who was a Portuguefe phyfician, and lived at Goa in the Eaft Indies, in 1563, fays “ the *tabaxir* of the Arabians, rendered *fpodium* by their interpreters, is not the *fpodium* of the Greeks : which is a metallic preparation, and never given internally. They differ as much as black from white ; and that the *fpodium* of the Greeks is the *tutty* of the Arabians.”

He fays that “ *tabaxir* is a Perfian word, which AVICENNA and other Arabian writers took from the Perfian language ; and that it implies, *laetens humor, aut succus liquorve alicubi*

concretus: by which name this medicine is known to the Arabians and Turks."

He says "the Indians call it *sacar-mambu*, that is, the sugar of the *mambu*; because the Indian canes, or trees, the branches of which produce it, are so called. But that they now call it *tabaxir* also; as by that name it is sent for from Arabia, Persia, and Turkey, and is imported, as an article of commerce, into those countries from India."

He says "the *tabaxir* is a very dear medicine in Arabia, and sells for its weight in silver."

The tree which produces it, he says, "is sometimes as large as a poplar tree; sometimes smaller; the branches generally grow erect (unless when bent for bowers and shady walks, customary among the Indians), with knots, the length of the hand asunder; with a leaf resembling the Olive leaf, but longer. Between each of the joints, a sweetish liquor is generated, thick like starch, and like it in whiteness; sometimes much, but sometimes very little. All the canes, or branches, do not contain this liquor, but only those which grow in Bijnager, Batecala, and part of the province of Malabar."

This

This liquor when concreted is sometimes found blackish, or of a grey colour, but it is not the worse on that account; because it arises from too great humidity, or that it has been retained too long in the wood, which makes it of this colour; but not from the burning of the tree, as some have supposed."

He then recites the opinion of RHASES, respecting the virtues of the *tabaxir*, and observes that in the latin version of SERAPION, it has been corruptly rendered *sataiscir*. He says "it is evident from what is stated, that AVICENNA was mistaken in supposing the *tabaxir* to be the ashes of the roots of the canes."

He says also, as a further proof of the *tabaxir* and *spodium* having been erroneously confounded together, "that *spodium* was not used internally by the Greeks; and that, by the testimony of the Indian, Arabian, Persian, and Turkish physicians, the *tabaxir* is used not only in external, but in internal inflammations; and also in bilious fevers and dysenteries." *Historia Aromatum, lib. I. cap. 12.*

PISO, a Dutch physician, who lived in the Brasils in the beginning of the last century, says, "in Egypt the *sacar* of the Arabians, from whence our word sugar is derived, is

produced from a low and little plant, coagulated by the heat of the sun ; but, in the East Indies, from the *mambu reed tree*, (he then refers to GARCIAS, whom he little more than copies in the whole article,) which is full of joints, and in size as large as the poplar tree. The *sacar-mambu*, which the Arabians call *tabaxir*, issues from this tree, a viscid whitish liquor, according to RHAZES, AVICENNA, and SERAPION." *Hist. Nat. & Med. lib. IV. cap. 1.*

He says, in another place, that " there are in the uncultivated regions of the Indies two species of canes, called *Mambu* ; or, as the Portuguese have corrupted the word into, *Bambu*. One sort is small and full of pith ; and the other large, and more hollow : for which reason they have been called by writers sometimes canes, and sometimes trees."

He then gives an account, not much deviating from GARCIAS, concerning the uses, and other particulars, of the *Bambu* cane ; observing, " that there are some so large, that the Indians make canoes of them, capable of carrying two people."

He says, " the full-grown *Mambu* canes have a soft, spongy, liquid, medullary substance, which

which the common people suck with avidity, on account of its grateful taste."

"When these canes are large and old, the liquor which they contain changes in colour, taste, and efficacy, and gradually protudes through the cane, between the joints, and is coagulated by the heat of the sun, and hardens like white *pumice* stone, and soon loses its native agreeableness of flavour, and acquires a taste something like burnt ivory, and is called by the Indians *sacar-mambu*. The lighter, whiter, and smoother it is, the more it is esteemed; and the more cineritious it is in colour and unequal in figure, the worse."

"It is held in estimation by the Indian, Arabian, Moorish, Persian, and Turkish physicians, for external and internal heats and inflammations, and bilious dysenteries; and the Indians use it in stranguries, gonorrhœas, and hæmorrhages."

"The word *tabaxir* is taken from the Persian language, and signifies *lac lapidescens*, which some credulous Arabians and Turks thought to be the ashes of canes, burnt by the friction produced by the wind blowing them together. This error has been propagated by the Latin interpreters of the Arabians, rendering *tabaxir*, *spodium*; because in taste and appearance it

somewhat resembles burnt ivory or hartshorn. But, as GARCIAS observes, *Spodium*, or *tutty*, is used only externally in the compositions of the Greeks; and *sacar-mambu*, or *tabaxir*, is generally used in the compositions of the Arabians, for internal purposes."

"The Indians have used the word *Sacar* in their language for this concreted juice, not on account of any sweetness in it, for many centuries. In after-times, when the art of making sugar from the expressed juice of the sugarcane was known, that factitious substance received the appellation of *saccharum*, or sugar: probably deriving its etymology from the *sacar* of the Indians." *Mantiff. Aromat. cap. 10.*

He makes many other remarks, chiefly copied from GARCIAS and SALMASIUS.

LINSCHOTON says, "there are over all India many sugar canes in all places, and in great numbers, but not much esteemed of: all along the coast of Malabar there are many thick reeds, especially on the coast of Coromandel, which reeds by the Indians are called *mambu*, and by the Portuguese *bambu*; these *mambu*'s have a certain matter within them, which is, as it were, the pith of it, such as quills have within them, which men take out when they
make

make their pens to write. The Indians call it *facar-mambu*, which is as much as to say, sugar of *mambu*, and is a very medicinable thing much esteemed, and much sought for by the Arabians, Persians, and Moors: they call it *tabaxir*." *Cap. 4. anno 1583.*

I think it is evident, from the authors above cited, that, supposing the *facar-mambu* of the Indians were the *tabaxir* of the Arabians, it is impossible it could be the *faccharum* of the ancients.

It is also unnecessary to contend that the *facar-mambu* of the Indians was not the *tabaxir* of the Arabians; for it appears to me that neither GARCÍAS, nor his follower PISO, were positive, from their own knowledge, what the *facar-mambu* is.

It is certain that the *facar-mambu* is not sweet, according to their account, and consequently cannot have any relation to sugar: and if it be the exuded gummous juice of the *mambu*, or, as we call it, the *bambu-cane*, it could not be sweet, for that tree contains no saccharine juice. How then could this be the sugar of the ancients?

The Arabians had their *tabaxir* from India. Their account of it is fabulous. Yet they all

agree that it was the ashes of the Indian cane : and whether it was a kind of pot-ash, or any other saline preparation, from vegetable excimeration, we cannot determine from any chemical or medical facts they have left us on the subject. Certain it is, there is no *sweetness* attributed to it, and consequently it could not be sugar ; and, as it was given internally, whatever resemblance it might have to *spodium*, it has no right to that interpretation ; as the *spodium* of the Greeks, as already observed, was a metallic preparation, and never used internally.

The Arabian medical writers were chiefly compilers and copiers from the Greeks ; and seem to have known but little, even of their own country. Their account of *manna* is as fabulous as that of their *tabaxir*, and has given rise to as many speculations. They supposed it was a dew, attracted by certain trees, plants, and stones, and there concentered.

AVICENNA denominates *manna*, a species of sugar, *zuccarum albusar* ; which, he says, falls on the plant *albusar*, or *albossar*, and is there collected in lumps, like salt.

Zuccarum albusar quid est ? Manna ; cadens super albusar, et est sicut frusta salis. Lib. II. tract. II. cap. 756.

SERAPION,

SERAPION, *cap. 45. de Temperamentis Simplicium*, speaking of *men*, or *manna*, says, from RHASES, when it first falls on the leaves of the trees, it is like honey, but green, which, by remaining there for some time, becomes white. He says also, from MESCHA, that its qualities depend on the nature of the trees on which it falls. He has another species of manna, *cap. 41.* which he calls *tereniabin*,—*mel roris*, and which he says, from EBENAMREZ, falls on trees with thorns, in the East.

The Arabian writers were all unacquainted with the real nature of manna, in supposing it to be dew, instead of the inspissated juice of trees.

RHAZES says, *cap. 20. de Simplicibus*,—*tereniabin* is hot, purges the bowels, and assuages the throat.

Indeed, AVERROES himself, in some measure, accounts for their being unacquainted with it, by saying, it was not the produce of their own country.—

Terregebim, id est manna, provenit à partibus superioribus Syriae, vel Indiae. cap. 55. Simplicia.

However, a different inference may be drawn from AVICENNA, who says, there are two sorts of manna, and both the produce of Arabia.

The

The white fort from *Iamen*, or *Yemen*; and the dark fort from *Agizium*, or *Hagiazi*. The former of these places is in Arabia Felix, and the latter in Arabia Deferta;—

Aliud est Iamenum, album; et aliud est Agizium, ad nigridinem declinans.

Lib. II. tract. II. cap. 756.

AVICENNA mentions a fugar, which is found on canes, like salt:—

Illud saccharum, quod super arundinem invenitur, sicut sal. De Zuccaro, lib. II. tract. 2. cap. 755.

SALMASIUS, believing in this error, that fugar was actually found ready made, asserts,—

De hoc ipso priscorum saccharo, sive tabaxir, accipi debet; cui nomen etiam propterea αλος Ινδικου veteres imposuerunt. De Canteo, cap. 79.

“ This is the fugar of the ancients, to which they also gave the name of *Indian Salt*; it is also the *tabaxir* of the Arabians.”

I have already shewn that this was not fugar, or any saccharine substance.

I have not given all the Latin versions of the Arabian writers in English, for reasons obvious to the learned.

What seems to have strengthened SALMASIUS in this error is, that the fugar described by the
ancients

ancients does not correspond with any species of sugar now in use. His own words are,—

Fallitur itaque mirum in modum si quis μελι καλαμιων, aut αλας Ινδικον, aut σακχαρον antiquum idem putat cum nostro saccharo. De Saccharo Comment.

It may now be proper to see what the ancients have left on record relative to our subject, in order to ascertain what evidence may be obtained from their writings, by which we may decide on the suppositions and opinions which have been advanced; and I apprehend it will appear, that the sugar known to the ancients was neither the *saccar-mambu* of the Indians, nor the *tabaxir* of the Arabians, nor, as many have imagined, *manna*.

DIOSCORIDES (*anno 64*), who is the first writer which mentions the word σακχαρον, or sugar, in his chapter περι Σακχαρου Μελιτος, demonstrates clearly that he was acquainted with some species of sugar, made from the sugar cane; though it plainly appears that he was ignorant of the nature of its preparation.—

Καλειται δε τι και σακχαρον ειδος ον μελιτος, εν Ινδια πεπηγοτος και τη ευδαιμονι Αραβια·
ευρισκομενον

ΕΥΡΙΣΧΟΜΕΝΟΝ ΕΠΙ ΤΩΝ ΚΑΛΑΜΩΝ, ΟΜΟΙΟΝ ΤΗ ΣΥΣΤΑΣΕΙ ΑΛΙΣΙ, ΚΑΙ ΘΡΑΥΟΜΕΝΟΝ ΥΠΟ ΤΟΙΣ ΟΔΟΥΣΙ ΚΑΘΑΠΕΡ ΟΙ ΑΛΕΣ.

“ There is a sort of concreted honey, which is called fugar, found upon canes, in India and Arabia Felix : it is in consistence like salt, and it is brittle between the teeth like salt.”

PLINY says,—

Saccaron & *Arabia fert, sed laudatius India. Est autem mel in harundinibus collectum, gummi-um modo, candidum, dentibus fragile; amplissimum nucis avellanæ magnitudine: ad medicinæ tantum usum.* Hist. Nat. lib. XII. cap. 8.

“ Sugar is brought from Arabia, but the best sort from India. It is honey collected from canes, like a gum, white, and brittle between the teeth; the largest is of the size of an hazle nut: it is used in medicine only.”

ARRIAN (*anno 123*), in *Periplo maris Erythraei*, says, there is a nation bordering on the Red Sea, who drink, *μελι το καλαμινον, το λεγομενον σακχαρι*;—“ honey of the reed, called fugar.”

GALEN (*anno* 164), in his 7th book of the temperaments and faculties of simple medicines, *περι Μελιτος*, says,—

Και το σακχαρ δε καλουμενον οπερ εξ Ινδιας τε και της ευδαιμονος Αραβιας κομιζεται περιπηγνυται μεν, ως φασι, καλαμοις, εστι δε τι και αυτο μελιτος ειδος ητηλον μεν ουν εστιν, η το παρ ημιν γλυκυ.

“Sugar, as they call it, which is brought from India and Arabia Felix, concretes, as they say, about the canes, and is a species of honey: it is less sweet than our honey.”

PAULUS ÆGINETA (*anno* 670), the last of the Greek writers on medicine, *lib. II. cap. 54.* says, from ARCHIGENES, who lived *anno* 117,—

Αλς ο Ινδικος, χροια μεν και συστασει, ομοιος τῷ χοινῶ αλι, γευτει δε μελιτωδης.

“The *Indian salt*, in colour and form like common salt, but in taste and sweetness like honey.”

In *lib. VII. cap. 3*, he says, “Honey is of an heating and drying nature in the second degree, and is abundantly cleansing. Boiled, it is less

less acrid and deterfive, and opens the bowels, but is more nutritious: but the bitter honey, such as comes from Sardonias, has the mixed property of being earthy and hot. The *other sugar*, which is brought from Arabia Felix, is less sweet than that which we have: but it has equal virtues, and is neither hurtful to the stomach, nor excites thirst like our honey."

It is true that DIOSCORIDES, PLINY, GALEN, and P. ÆGINETA, all mention that sugar came from Arabia as well as from India; but it is certain that the sugar described by them to be "white like salt, and brittle between the teeth, and sweet like honey," was brought from India into Arabia; and was not the produce of Arabia; and this is proved by what follows.

AVICENNA recommends, from ARCHIGENES, as quoted by P. ÆGINETA, when the tongue is dry and parched in fevers, to cleanse it with oil of almonds and white sugar; and that the sick should have in his mouth a lump of "the salt that is brought from India; which in colour is like salt, and in sweetness like honey."—

"*Sal, qui asportatur de India, & in colore salis, & dulcitudine mellis.*" De Asperitate Linguæ, lib. IV. fen. 1. tr. 2. cap. 22.

Here

Here we have, I think, decidedly the sugar of the ancients.

This can be no other preparation than that we now call white SUGAR-CANDY; which I consider as the real *μελι καλαμινον; αλς Ινδικος;* — *σακχαρον antiquorum.*

It is evident AVICENNA erroneously supposed this saccharine preparation as a natural, and not as an artificial production; when, speaking of the different sorts, or rather coloured sugars, he compares it in appearance to salt; and says it is found on canes, in the passage before mentioned.

In different parts of this treatise, I have selected from the Arabians every thing they have said pertaining to the subject; but there is such a want of discrimination among the Arabian writers, which their editors, translators, and commentators, have further perplexed with various texts, interpretations, and conjectures, that it is impossible to know exactly the precise distinctions, intended by the original authors, in their different appellations of *honey, manna,* and *sugar.*

However, the sugar cane is unquestionably a native plant of some parts of Arabia; and, though the art of evaporating its juice for the purpose of making a common, coarse, or muscovado

covado fugar, was known long before AVICENNA's time; yet I cannot suppose, a thousand years prior to his time, that the fugar of the ancients, being fugar-candy, was made in Arabia; especially as AVICENNA himself, if we admit the *salt* he mentions to be the same, says it was brought to Arabia from India.

Yet PLINY is very particular, in observing that the Indian fugar was superior in quality to the Arabian; which shews, that some of the fugar known to the Romans in his time, must have been brought from Arabia, if not manufactured there.

Besides, we know that there is no such thing as fugar found on canes; and, so far from the juice of the cane issuing from the plant, and concreting like gummous or vegetable resinous juices, the plant decays on being wounded; and, without being wounded, the juice never escapes from its stem.

Every kind of fugar whatever is made by art. Native fugar never existed. Ignorant people, even at this day, in our own part of the world, imagine that fugar is found, like pith, in the hollow of the canes; in the state in which it is brought to Europe.

The crystalline appearance of fugar-candy, and its fragility between the teeth, might naturally

turally lead the ancient writers to give it the appellation of *salt*; especially as the salt used by them was rock, or fossile salt, in form and pieces similar to sugar-candy: and, from its sweetness, that of *honey* of the *reed*; as honey was their standard of sweetness.

It was also very natural, for people who knew nothing of the process of making sugar, that they should consider it, being a vegetable production, as a gum; and, like other gums, to be the exudations of some plant, or tree, concreted by the heat of the sun.

There can be no doubt but that the sugar of the ancients, and that species of sugar described by the Arabians as resembling salt, with the sweetness of honey, were the same article; and as in the writing of the ancients there is only one sort of sugar mentioned, and though that sugar is said by some of them to have been brought from Arabia, as well as from India, yet the Arabians themselves mention it as brought from India only; and there is every reason to believe, at that period, the art of chrySTALLIZING the juice of canes was understood only in India.

Indeed, sugar must have been better known in Greece and in Italy, from their contiguity to Arabia, had it then been manufactured in

that country. Besides, there is no mention among the antients of any kind of sweet canes or reeds, but what were particularly said to have grown in India.

As it is certain that sugar was brought from India at the time when mention was first made of it, it is proper to enquire whether it was manufactured in India only; and what sort of sugar was made in India in those times; or at least to draw the best inference we can from what we know of the history of the commerce of sugar, and the manufacture of it in the East Indies, at this time.

There have ever been, since our knowledge of the East, two sorts of sugar made there; raw or muscovado sugar, and sugar-candy; the first used only for culinary purposes, and the latter for every other purpose of diet, luxury, and exportation.

The art of refining sugar, and making what is called loaf-sugar, is a modern European invention, the discovery of a Venetian about the end of the 15th, or beginning of the 16th century; and not practised in India until very lately.

China boasts, and not without reason, of the antiquity of her arts and policy over the rest of the East; as well as over the rest of the world.

world. The sugar cane is indigenous to China. The climate and soil in many parts of Bengal, and other districts of the East Indies, are also suitable to the growth and cultivation of the cane; and sugar is, and we have reason to suppose ever has been, produced there. Nevertheless, China is the only country in the East, even now, where sugar-candy is made in perfection.

The bright, transparent sugar-candy, so beautiful in appearance, and so grateful to the taste, is a peculiar manufacture, and was originally invented in China.

It is exported from China to every part of India, and even to many countries there, where abundance of sugar is made.

Du HALDE says, the sugar of China constitutes a great trade to Japan; and that when ships go directly from Canton to Japan, the sugar-candy so transported yields a profit of a thousand per cent.

The Chinese, and all the nations of the East, set no estimation on any other sugar than sugar-candy. They use it in tea, coffee, and all other beverages: and this preference, no doubt, arises from judgement, as the fine sugar-candy is incomparably the most delicious sweet in the world. This may account for the

art of refining sugar into loaf-sugar never having been practised in the East.

In the ancient, steady, and unchangeable empire of China, arts existed, while Europe was in a state of barbarism; arts, which are still the admiration of mankind; and it is probable that this mode of preparing sugar, so well calculated for carriage and preservation, was practised by the Chinese, and was an article of commerce among them, in much earlier ages than are comprehended in European traditions; which they consider but as the records of yesterday.

In respect to the derivation of the word *candy*, and when this adjunctive appellation was first used, to distinguish *sugar-candy* from other species of sugar, various have been the opinions of the learned.

Some suppose it had its origin from the island of Candia (Crete);—others, from Gandia, a town in Valencia, in which province sugar was first made in Spain*;—others, from the Arabic *كند* *kand* or *kend*, which simply signifies sugar;—and others, from the Latin *candidum* (*à candore*), bright, shining, white.

* See page 17.

SALMASIUS derives it from a corrupt Greek word of the middle ages. He says,—

“*Saccharum candum, non à candore dictum, nec à canna; sed κανλι, vel κανλον, & κανλιον, Græci recentiores vocârunt, quod angulosum sit; & quum frangitur, in partes semper dif-
filiat angulatas. Id Græci vulgares κανλον appel-
lant.*” Plin. Excert. p. 718.

But this is by no means satisfactory; for, if sugar-candy had this appellation from its angular figure, entire, or broken, the word should be written *cantum*, or *cantium*, in the Latin; or rather *canthum*, or *canthium*; as *κανθος* is *angulus*, an angle or corner.

SALMASIUS has taken this barbarous word from NICHOLAS MYREPSUS, who wrote his collection of *formulae*, from the Greek and Arabian authors, about the year 1280: he is one of the latest writers in the Greek language. His writings are full of barbarisms, and *κανλιον* is found used by him, *De Antidotis*, cap. 35, 94, and 96, to express what the translators have rendered, “*saccharum appellatum candum;*”—the sugar-candy of the moderns.

FUCHSIUS, one of his translators, observes, in the notes to cap. 35, and 94, that though

the word is *κανλιον* in the manuscript copy, and implies what we now call *saccharum candi*, *vel candidum*, yet it seems to have been written originally *κανδιον*;—and that *candi* is only an abbreviation of *candidum*.

Now *κανδιον*, I believe, stands on no better authority in the Greek language than *κανλιον*; and I think it is difficult to ascertain whether the word be a corruption of the Greek *κανθος*, or the Latin *candidum*, considering the period when MYREPSUS wrote.

However, I am not inclined to give my suffrage to any of the preceding etymons.

May it not have for its origin the Indian word *kband*, from whence the Arabic *قند* *kænd* is derived, and which is a general appellation for sugar in Hindostan? Sugar-candy is there called *misree*; white sugar, *cheenee*; a composition they make of sugar and roses, *goolkund*; in Arabic *گولقند* *gülkænd*; a drink made of the same materials, *goolshukure*; the inspissated juice of the cane, *kund-seah*, or *jaggery*.

Shukur also is a general appellation for sugar; from which, and the word *kband*, it appears to me, that the others are compounded.

From *shukur*, the Indian origin, it is most probable that the word sugar is derived; from
thence

thence the Arabians and Perfians had it; *سكّر* *sikker*, Arab. *شکر* *seker*, Perf. & Turc. and it has undergone but little variation since, in European languages. And, though these particulars do not seem to have been known to the learned philologist, SKINNER, he was certainly right in his conjecture;—*vox (sugar) proculdubio, ab Indis Barbaricis, cum re translata.*

To conclude this part of my subject, I think there can be no doubt but that sugar-candy was the first and only species of sugar known to the European antients, and that it was the original manufacture of the East, particularly of China, the most ancient of the Eastern nations; and found its way into Europe, as we are certain raw sugars did in after-ages, when first known to Europeans, by the way of India, Arabia, and the Red Sea; several centuries before MYREPSUS lived.

The Venetians, anterior to the year 1148, imported considerable quantities of sugar from India by the Red Sea, and also from Egypt. Sugar was likewise made before that time in the Island of Sicily. With the produce of this island, and the sugar imported from India and Egypt, the Venetians carried on a great traffic, and supplied all the markets of Europe with this commodity*.

* *Essai de l'Histoire du Commerce de Venise*, p. 100.

Indeed, the Venetian history informs us, that even prior to 991, when ORSEOLO was Doge of Venice, the Venetians, then forcing their commerce with the Saracens into Syria and Egypt, brought back from thence in return, not only rice, dates, senna, cassia, flax, &c. but also sugar*.

This shews how much WOTTON was mistaken, when he asserted, that “all the arts and methods of preparing sugar, which have made it so very useful to human life, are owing to the modern Portuguese and English †.”

DOCTOR WILLIAM DOUGLAS, of Boston in America, was also mistaken, when, remarking that “the ancient Greeks and Romans used honey only for sweetening, and that sugar was not known amongst them,” he asserts that “PAULUS ÆGINETA is the first who expressly mentions sugar ‡.”

DOCTOR CAMPBELL was likewise erroneous when he asserted, that “the sugar canes were certainly known to the ancients, though what we call sugar was not; for, manufacturing the sweet juice of the sugar cane into that form was the invention of the Arabians, who

* *Essai de l'Histoire du Commerce de Venise*, p. 71.

† *Reflexions upon Ancient and Modern Learning*.

‡ *Summary Historical and Political*, Vol. I. p. 115. *Anno 1760.*

bestowed upon it the name it bears, calling it in their own language *succar* *.”

The art of refining sugar was first practised in England in 1544. The first adventurers in this business were *Cornelius Buffine*, *Ferdinando Points*, *Mounsie*, *John Gardiner*, and *Sir William Chester*; these persons were the proprietors of two sugar-houses, which were all that were at that time in England †.

The profits arising from this concern were at first but very inconsiderable; as the sugar-bakers at Antwerp supplied the London market at a cheaper rate than what the English sugar-bakers could. After the intercourse between England and Antwerp was stopped, these two sugar-houses supplied all England, for the space of twenty years; and greatly enriched the proprietors. This success induced many others to embark in the same trade; a number of sugar-houses were established, and many persons failed, and became bankrupts.

In 1596, *Sir Thomas Mildmay*, on the pretext that frauds were practised in refining sugar, petitioned queen Elizabeth for a licence, for an exclusive right to refine sugars, for a term of years; for which monopoly he offered to pay

* Considerations on the Sugar Trade, p. 5. Anno 1763.

† Stow's Survey of London, Ed. 1720. vol. II. p. 244.

an annual sum. His petition however was rejected: and England, which formerly had been supplied with refined sugar from Antwerp, the chief commercial city then in Europe, now not only supplied itself, but exported great quantities to other countries.

Sugar was taxed by name in England, 2 James II. cap. 4.; prior to that time, it paid twelve pence per pound, or five per cent. poundage, as then was the case with all other imported goods.

ON THE
PROPERTIES AND USE
OF
SUGAR.

SUGAR, when first introduced into every country, was used only medicinally. PLINY leaves no room for doubt on this point. Even in Arabia, in AVICENNA's time, though sugar was an article of commerce from the East, there is no record of its being used in dietetic, or culinary purposes, for several centuries afterwards.

Sugar was employed originally to render unpleasant and nauseating medicines grateful to the sick: and in pharmacy, in syrups, electuaries, confections, and conserves.

ACTU-

ACTUARIUS was the first physician who substituted sugar for honey in medicinal compositions*.

It is not to be supposed, however, that such a delicious and innocent article could longer be subject to the controul of the physician, and confined to the apothecary's shop, than while the quantity obtainable was insufficient for the purposes of luxury; and the price too great to be admitted, by the generality of mankind, as an ingredient in their food.

As there are but few of the ancients who have even mentioned sugar, it is not difficult to collect all that has been said of it by them, as to its use. It appears nevertheless, that it was preferred in their days to honey in medicine.

I have said that ACTUARIUS was the first physician who used sugar, instead of honey, in prescriptions; because he is supposed, by me, to have written *anno* 1000; which was before MYREPSUS made his compilation; though some writers place ACTUARIUS three centuries

* De Pulmonis et cæteris Thoracis Vitiis, lib. IV. cap. 4. lib. V. cap. 1. cap. 2. cap. 4. cap. 5. cap. 8. He likewise mentions the sugar called *penidii*, lib. V. cap. 6 and 9.—this *penidii*, or *penidium saccharum*, is denominated by the Greek Writers *συνδία*.

It is thought to have been a preparation of sugar, like what we call barley-sugar.

(anno 1300) after that period, and subsequent to MYREPSUS.

DIOSCORIDES, who is the first that mentions sugar by name, σακχαρον, from which the Latin *saccharum* is derived, is also the first who speaks of the medicinal qualities of sugar. In his chapter, περι Σακχαρου Μελιτος, he says:—

Εστι δε ευκοιλιον, ευστομαχον, διεθεν υδατι και ποθεν ωφελουν κυστιν κεκακωμενην και νεφρους· καθαιρει δε και τα τας κορας επισκο τουνηα επιχρισμενον.

“ It opens the bowels, and is good for the stomach, when drunk dissolved in water: it relieves pains in the bladder and kidneys: and discusses those films which grow over the pupil of the eye, and cause a cloudiness in the sight.”

The latter part of this passage implies the external application of sugar. Blowing powdered sugar, or fine sugar-candy, into the eyes, has long been a popular practice to remove films, and ophthalmies. Perhaps the practice originated with DIOSCORIDES.

GALEN, in his 7th book of the temperaments and faculties of medicines, περι Μελιτος, says,—

Την

Την δυναμιν δε παραπλησιον αυτω, καθ' οσον απορρυπλει, και ξηραινει, και διαφορει καθ' οσον ουτε κακοστομαχον εστιν ως το παρ ημιν, ουτε διψωδες, αποκεχωρηκε της ουσιας αυτου.

“It possesses similar virtues (to honey), as far as relates to absterging, drying, and digesting; however, it is not hurtful to the stomach like honey, nor causes thirst: so far it differs from honey.”

GALEN also, in his 8th book of his method of healing, recommends sugar, among the articles to be used, for the regimen of the sick in fevers.

PAULUS ÆGINETA, *lib. II. cap. 54.* recommends, from ARCHIGENES, a piece of “the Indian salt, which, in appearance, resembles common salt, but in sweetness honey;” to be kept in the mouth, to moisten it in fevers.

In the very few preceding authorities we have all that those who are termed the ancients have left us on the medicinal virtues of sugar.

We must now take a survey of the confused accounts of the Arabians, being the next authorities in succession, respecting their different species of sugar.

I shall

I shall begin with AVICENNA, and give the Latin version of this author. From the rest of this tribe of copyists I shall confine myself to a few passages, which I shall give in English only.

AVICENNA says, in his chapter on honey,—

Mel cannarum lenit ventrem, et mel tabazet non lenit. Lib. II. tract. 2. cap. 496.

“The honey of canes opens the bowels; but the *tabazet* (the white sort of honey) does not.”

In his chapter expressly on sugar he says,—

Zuccarum quid est? Arundo zuccari in natura zuccari existit, et est vehementioris lenificationis quàm ipsum. Frigidius est album et est subtilius. Et universaliter est calidum in fine primi. Et antiquum declinat ad siccitatem in primo, et est humidum in ipso; et quanto magis antiquatur, tanto plus exsiccat. Est lenificativum, absterfivum, lavativum. Et sulimenum est magis lenitivum, et propriè Alfenid; imò mel arundinis et zuccarum non sunt inferiora melle in abstergendo, et mundificando; et quanto plus antiquatur zuccarum, tanto sit subtilius. Assumptum sicut guma ab arundine, abstergit oculum. Lenit pectus,*

* Penidium Saccharum.

et removet ipsius asperitatem. Est bonum stomacho, in quo non generatur cholera: ipsum enim lædit, propterea quia ad choleram convertitur, et est aperitivum oppilationum, et in ipso est virtus faciens sitim, minorem tamen sitim, quàm facit mel propriè antiquum, et generat antiquum sanguinem fæculentum, et abstergit phlegma stomachi, et in arundine quidem zuccari est juvamentum ad vomitum. Solvit, et propriè illud quod super arundinem invenitur, sicut sal, et sulimenum quidem, et rubeum vehementioris sunt lenificationis, et quandoque inflat, et quandoque sedat inflationem, et ipsum quidem cum oleo amygdalino confert colicæ. Lib. II. tract. 2. cap. 755.

AVICENNA, in his chapter de *Asperitate Linguae*, copying P.ÆGINETA, says, the tongue, when rough and foul in fevers, should be cleansed with oil of almonds and white sugar; and after that he says,—

Teneat in ore suo salem qui asportatur de Indiá, et est in colore salis, et dulcedine mellis; et sumat de eo secundum quod dixit ARCHIGENES, quantitatem fabæ unius. Lib. IV. fen. 1. tract. 2. cap. 22.

“The sick should hold in his mouth the salt which is brought from India, which is in colour like salt, but in sweetness like honey; and he should take of it, according to the directions

directions of ARCHIGENES, the quantity of a bean."

He says again, in his chapter *de Cibatione Febricitantium in generali*,—

Mel cannæ, quod est zuccarum, et propriè mundificatum, melius melle apis, licet ejus abstersio sit minor abstersione mellis. Lib. IV. fen. 1. tract. 2. cap. 8.

"The honey of the cane, that is, fugar, well cleansed, is better than the honey of bees, although its abstersive quality is less than that of their honey."

In his chapter *De Aduotione Linguae*, he advises fugar to be holden in the mouth, to assuage thirst. Lib. III. fen. 6. tract. 1. cap. 19.

AVICENNA further remarks, on the virtues of fugar, compared with honey;—

Quod in Syrupo Acetoso ponatur zuccarum loco mellis; quum zuccarum in abstersione non deficiat à melle plurimum valde; et sic zuccarum minus calidum quam mel, et magis remotum valde, ut convertatur in choleram, quam mel.

Tract. de Syrupo Acetoso.

"That fugar should be used in the syrup of wood sorrel (which was used among the Arabians to make a cooling beverage in the summer time) instead of honey; as fugar is not

much inferior to honey in its absterfive property, and is less heating; and much less subject to produce bile."

AVICENNA has a chapter on *Fanid*, or *Penidium*, sugar; which the translators have rendered *Penidii*; the same as before termed *Alfenid*, or *Saccharum Penidium*.

He says,—

Penidii, calidi sunt et humidi in primo, et propriè albi, et sunt humidiores aliis. Sunt grossiores zuccaro. Sunt boni tussi. Sunt lenitivi ventris. De Penidiis, lib. II. tract. 2. cap. 555.

"The *Penidii* are hot and moist in the first degree, particularly the white, which are more moist than the others. They are larger than sugar. They are good for a cough. They open the bowels."

RHASES says, "sugar softens the throat and bowels, and does not heat but in a very small degree. Honey is hot, and soon converted into bile; but it destroys phlegm, and is good for old men of cold habits. In summer time, and to those of a hot temperament, honey is hurtful. The *Penidii* are hot; but are alleviating to the throat, bowels and bladder, and warm the parts about the kidneys."

SERAPION,

SERAPION, though he has a separate chapter concerning sugar, relates only the opinion of others.

He begins with GALEN, and mentions almost verbatim what I have already given from that author: particularly that sugar is not prejudicial to the stomach, nor causes thirst, like honey.

From DIOSCORIDES he has given the same account I have; that it is a species of honey found on the canes in India and Arabia: that it is in substance like salt, and brittle between the teeth like salt.

From ABEN MESUAI, he says, "it opens the bowels, strengthens the stomach and cleanses it, particularly from bile; which it expels by its absterfive property. The white sort is not so mollifying as the red, and that brought from *Hegen*, like lumps of salt.

"The *haoscer* sugar strengthens the stomach, and is good for pains in the bladder and kidneys, and clears the sight when used in a collyrium; and it dries and resolves the lax films that extend from the angles of the eyes, over the pupils: when drunk, it does not cause thirst, and on this account it is good in the dropsy, when drunk with the milk of mandragora, or *Lafaba*.

“New fugar is hot, and moist; and the old hot, and dry. It is good for wind in the bowels, and opens them, and when taken with oil of sweet almonds, it is good in the colic; and the old sort is good for phlegm in the stomach, unless it causes thirst, and generates thick blood. That which is brought from *Aliemen*, and is like mastich, and is called *haoscer*, is good for the stomach and liver; on account of a small degree of bitterness in it: fugar is good for pains in the bladder and kidneys, and cleanses them.”

From ISAAC BENSULAIMEN he says, “the fugar brought from the region of *Heigen*, and called *haoscer*, is less sweet than the other sorts of fugar, and more drying; for which reason it does not remove thirst like the other species of fugar: but it produces good effects in pains of the kidneys, and when drunk in milk of mandragora is good in the dropsy. The milk of the *haoscer* also, when drunk with the milk of mandragora, has the same operations, in a greater degree; but it is not so safe, in habits of hot temperaments.”

From ABRIANIFA he says “the *haoscer* has broad leaves, and has fugar, which comes out at the buds of the branches, and at the bottom of the leaves; from whence it is collected:

in

in which fugar, there is a bitternefs. The tree bears a kind of apple, about the fize of an egg, which yields a corrofive liquor. It produces a down, with which pillows and bolsters are ftuffed. The tree is called *chercha*. When the leaves are cut, the *haofcer* yields a milk which is collected in the month of May, and fkins are put in it; and it takes off the hair. The wood of the *haofcer* is fmooth, ftraight, and beautiful; and mufical bards, in their love fongs, compare the limbs of their miftreffes to it."

De Temperament, Simpl. cap. 50.

SERAPION has a chapter alfo from ABEN MESUAI, on the *penidii*, before mentioned, by AVICENNA, and RHASES. It is verbatim from AVICENNA,

Having now felected every thing pertaining to fugar from the Arabians, I fhall proceed to examine the various opinions of writers in later times, concerning its properties.

The firft man who took much pains to beftow a great deal of unqualified censure on the ufe of fugar, was DOCTOR THEOPHILUS GARENCIERES; the next was our celebrated DOCTOR THOMAS WILLIS.—SIMON PAULI had preceded them, with his crude notions.

The opinions of these physicians were adopted, in the infancy of sugar in England, by Mr. RAY; and the sentiments of these four authors have been disseminated in every part of Europe.

GARENCIERES says, “*Saccharum et saccharata omnia toto genere huic morbo (Tabes Anglica) infensissima, & in eo progignendo multa esse censeo quorum quum usus sit tam frequens, mirum videri non debet si tanta tabidorum seges hic pullutat,*” &c.

“*Cum de saccharo prædominante qualitate sit sermo, illam esse caliditatem contendo, quamvis satis obscuram; indicio est quod sitim gignit,*” &c.

“*Qua qualitate calida non parum pulmone obesse potest, cum pulmo sit maximè calidus et moderatè frigidis potius delectetur, calidiorum vero usu facile inflammationem excipiat,*” &c.

“*Sed quod cardo totius rei est, saccharum non solum temperamento et materia, verum etiam tota substantia pulmone est inimicum id quod neminem non ignarum mihi negaturum esse puto; cum enim non solum dulce, sed etiam sit dulcissimum, & propterea amaro è diametro oppositum numquid sequi debet, si amarum ex omnium recepta sententia super vacuos humores siccando absorbet aut detergit, ac propterea optimaratione putredinem arcet, et corpora diu integra conservat, quod dulce propter oppositas facultates, facundus*

fœcundus putredinis parens esse debet, id quod etiam longe citius accidet si in partem quæ nulla coëtrice facultate prædita sit incidat, à quâ postea non possit edomari? &c.

“ Certum est nullam, vel minimam, fieri fermentationem inter ea quæ quâlitatibus inter se conveniunt, ut saccharum et caro, illud enim propter dulcedinem et balsamicam qualitatem, hæc vero ob humorem dulcem, ita ad invicem accedant, ut si caro quæpiam saccharo condiatur, festinam corruptionem patietur, nisi saccharum ad amaritudinem excoctum sit, cum tamen sale condita in multum tempus perseveret, eo quod inter salem qui acris est, et carnis balsamum quod dulce est, quædam sit fermentatio propter dissidium qualitatum, post quam fermentationem novum quoddam temperamentum procedit; idem etiam apparet in saccharo, quod, cum ita cito carnes corrumpat fructus tamen acidos longiuscule à putredine incolumes tutatur, quia ipsius dulcedo cum aciditate seu acerbitate fermentatur, et novum inde temperamentum perfectè mixtum producit. In supradietorum confirmationem non omittendum est, quod in insula Sancti Thomæ sub æquatore molunt cannas, et quod superat, expresso succo, objiciunt porcis qui inde dicuntur in tam miram teneritudinem pinguescere, ut de bonitate cum capris Hispanicis certent, denturque vulgo ventriculis invalidis ad facilem concocturam. Unde

colligere est, quod, si saccharum ea vi et facultate pollet, ut suillam omnium fere carniū tenacissimam ad tantam teneritudinem adducat, eadem prorsus ratione corruptelam et sphacelum in pulmonibus accelerabit, cum ipsi sint molles et spongiosæ substantiæ, et stypticis astringentibus conserventur. Luce igitur clarius est saccharum non alimentum sed nocumentum, non alexiterium sed deleterium, esse ad Indias rursus ablegandum, ante quas detectas verisimile est effectum hunc planè latuisse, et cum iis mercibus ad nos esse advectum.” Angliæ Flagellum, seu Tabes Anglica. Anno 1647. p. 92. & seq.

The substance of which is,—

“ Sugar and all kinds of sweetmeats are very hurtful in consumption of the lungs; and, as I conceive, the so frequent use of these things tend much to create that disease; and it is not to be wondered at, that consumptive complaints are so common in England.

“ In respect to the predominant quality of sugar, I contend that it is heating, although hidden; and, as a proof of it, it excites thirst.

“ This heating quality of sugar renders it not a little injurious to the lungs, which are in themselves very hot; moderately cooling things
are

are therefore most agreeable to their nature ; but heating things easily inflame them.

“ But the most important consideration is, that sugar is not only injurious to the lungs in its temperament and composition, but also in its intire property ; which, I believe, no sensible person will deny ; when, from its excessive sweetness, it is diametrically opposite to the bitter principle, it must follow, if bitter things, according to universal suffrage, absorb and deterge superfluous humours, expel putrefaction, and preserve bodies sound for a great while, that sweet things, from their opposite qualities, must be the fruitful parent of putrefaction ; and which must necessarily be more active in their effects when a part is attacked not endowed with the power of concoction ; and from which afterwards it is not possible to remove the disease.

“ It is certain there is no fermentation, or very little, produced between things which agree in their qualities, as sugar and flesh ; on account of the sweetness and balsamic quality of sugar and the sweet essence of flesh, which assimilate with each other ; for, if a piece of raw meat be put in sugar, it soon becomes putrid, unless the sugar should have been first boiled until all its sweetness is consumed, and
it

it has acquired a bitterness; but when the meat is put into salt, it will be kept from putrifying for a great length of time, from that property in the salt which is acrid, and the balsam of the meat which is sweet, causing a kind of fermentation from the opposition of their qualities; after which fermentation a certain new temperament arises.

“ The same also appears in sugar, which, though it so soon corrupts flesh, yet it will preserve acid fruits from putrefaction for a long time; because its sweetness ferments with the acidity or sharpness of the fruits, from which a new uniform temperament is produced.

“ In confirmation of the preceding observations, it is not to be omitted, that in the island of *Saint Thomas*, under the æquator, the inhabitants feed their hogs with canes, and the refuse of the cane juice; from which they are said to fatten, and acquire such wonderful tenderness, that their flesh equals in goodness the Spanish kids, and is commonly given to people with weak stomachs, on account of its easiness of digestion.

“ From hence we may infer, that if sugar possesses the power and property of converting hog's flesh, the toughest almost of any animal's,

mal's, to so great a degree of tendernefs, for the same reason it must accelerate the decay and sphacelation of the lungs, when they are of such a soft and spongy substance as to require styptics and astringents to preserve them.

“ It is therefore clearer than the light that sugar is not a nourishment, but an evil ; not a preservative, but a destroyer ; and should be sent back to the Indies, before the discovery of which, probably, consumption of the lungs was not known, but brought to us with these fruits of our enterprize.”

WILLIS says,—

Saccharo condita, aut plurimum imbuta, in tantum vitupero, ut illius inventionem, ac usum immodicum, scorbuti in nupero hoc seculo immani augmento, plurimum contribuisset, existimem ; enim vero concretum istud sale satis acri & corrosivo, cum sulphure tamen delinito, constat, prout ex analysi ejus spagyricæ facta liquido patet. Quippe saccharum, prout supra innuimus, per se distillatum, exhibet liquorem aqua stygia vix inferiorem ; quod si ipsum, in vesica plurima aqua fontana perfusum, distillaveris, quamvis sal fixus non adeo ascendit, prodibit tamen liquor instar aquæ vitæ acerrimæ, urens, ac summe pungitivus ; cum itaque

itaque saccharum, quibusvis fere alimentis commixtum, ita copiose a nobis assumitur, quam verisimile est, ab ejus usu quotidiano, sanguinem & humores, salsos et acres, proindeque scorbuticos, reddi? Author quidam insignis TABIS ANGLIÆ causam in immoderatum sacchari apud nostrates usum retulit: nescio an non potius etiam hinc scorbuti increbrescentis fomes derivetur. De Scorbuto, cap. 10. Anno 1674.*

“ I so much condemn all things that are preserved with sugar, or have much sugar mixed with them, that I consider the invention, and immoderate use of it, in this present age, to have very much contributed to the immense increase of the scurvy.

“ For it plainly appears, by the chemical analysis of sugar, that this concrete consists of an acrid and corrosive salt; but tempered with a portion of sulphur.

“ Sugar, distilled by itself, yields a liquor scarcely inferior to *aqua fortis*; but, if it be diluted plentifully with water, and then distilled, although no fixed salt will ascend, yet there will come a liquor like the sharpest brandy; hot, and highly pungent.

* He alludes to GARENCIERES.

“ Therefore

“ Therefore it is very probable, that mixing sugar with almost all our food, and taken to so great a degree, from its daily use, renders the blood and humours salt and acrid; and consequently scorbutic.

“ A certain eminent author* attributes the cause of the frequency of consumptions of the lungs, in England, to the immoderate use of sugar. I am not certain whether also the fomes of the increasing scurvy may not rather be derived from thence.”

RAY says,—

Antiquiores medici, qui superiore seculo vixerunt, unanimi fere consensu saccharum ad pectoris & pulmonum vitia, raucedinem, tussim, gutturis asperitatem, lateris & thoracis ulcera, commendant. Cæterum apud nos in Anglia non ita pridem in crimen adduci, & magna infamia laborare cæpit, medicis tum nostratibus, tum extraneis, scorbuti & tabis popularium morborum præter solitum grassantium nuperas furias, immoderato in cibis & potu sacchari usui imputantibus †. Et, ne quis humidiori potius æris constitutioni eas pestes suspicetur; in Lusitania (aiunt) regione calida ob eandem rationem tabes epidemica facta est. Lu-

* GARENCIERES.

† WILLIS and SIMON PAULLI.

sitani enim plus sacchari consumunt quam quævis alia gens præter Anglos.

De scorbuto iidem antiquiores, quos diximus, medici cum recentioribus consentiunt, eum à sacchari nimio usu produci, cum dentibus valde nocuum, nec eos nigros duntaxat reddere, sed & putrescere & vacillare & exidere facere saccharum scribant, quæ certa scorbuti signa & symptomata sunt. Saccharum enim salem acidum & maxime corrosivum continere ex distillatione patet. Scorbutus autem sali fixo in sanguine redundanti debetur, proinde iis quæ sale volatili abundant sanatur. Historia Plantarum, lib. XXII. cap. 3. p. 1279, 1280, Anno 1688.

“The physicians who lived in the last century, with unanimous consent, recommend sugar for complaints in the lungs, hoarseness, cough, rawness of the throat, and internal ulcerations: yet, among us in England, not long since, it began to be accused, and to labour under great discredit, by our own, as well as foreign physicians, who impute the ravages which the scurvy and consumption have lately made in England to the immoderate use of sugar in our food and drinks.

“No person should therefore attribute these evils to the moisture of the atmosphere; for, they

they say, that in Portugal, where the air is warm, consumption of the lungs is there epidemic, from the same cause; as the Portuguese use more sugar than any people, except the English.

“ In regard to the scurvy, the same more ancient physicians, as well as those of later times, agree, that it is produced by the too great use of sugar; and that it is very hurtful to the teeth, and not only renders them black, but causes them to decay, and to loosen in their sockets, and to fall out; which are certain signs and symptoms of scurvy.

“ Sugar also contains an acid and very corrosive salt; which appears from distillation.

“ The scurvy is caused by a redundant fixed salt in the blood; and is therefore cured by such things as abound with a volatile salt.”

From these extracts it appears, that GARENCIERES and WILLIS were the founders of the sect of Antifaccharites.

I have been more extensive in my quotations from these writers than I should have been, if it were not that I wish to present the reader with that jargon of GARENCIERES, and abstruse and obsolete theory of WILLIS, which have been considered as standing authority by
many

many subsequent writers; and quoted in academic dissertations, in the schools of medicine.

In WILLIS's time, according to his account, and his account is true, almost every person had, or fancied he had, the scurvy.

He says,—

Nunc fere omnes eo laborant, aut se laborare putant.

The scurvy at that time made great ravages in England; besides which, the fashion of the day gave to the scurvy, all the minor straggling indispositions that were destitute of adoption.

Consumption of the lungs, and every other species of scrophula, are endemial in England. Scurvy is the same. This disease, which made so much havoc in the last century, is now scarcely known in England.

The scurvy, like any sporadic disease, may have its revolutions, and appear and disappear in the character of an epidemic. I do not speak of scurvy acquired by local and particular causes.

It is incredible that WILLIS and RAY, two well-informed men, should not know that the description of people most afflicted with the scurvy, at all times, and in every country, is that, which seldom taste any sugar.

It

It is not less extraordinary that the learned WILLIS should refer to so superficial an authority as GARENCIERES; or the laborious RAY, to the weak effusions of SIMON PAULLI.

The rhapsody of GARENCIERES is entirely his own; but what WILLIS advances has a better stamen, but it is not his own. It is taken from ANGELUS SALA, whom he has not mentioned, and from whom he has made a partial selection, merely to support his favourite theory of the scurvy.

SALA enumerates many evils which may arise in weak habits and bad constitutions from the *excessive*, and what he terms the *abuse* of sugar; such as, debility of digestion; loss of appetite; blackness and loosening of the teeth; offensive breath; colic; lax bowels; bilious, scorbutic, and hysterical complaints.

But let it be remarked, that it is to the inordinate use of sugar, among already diseased people, to which SALA attributes these evils.

For, his own reflexion on the occasion is, that "the excessive use of the most excellent and salutary things is always hurtful to the human frame."

SALA, however, views the subject with impartiality, if not with judgement; and does

ample justice to the wholesome properties of sugar.

Sacchari virtutes ac operationes, secundum rationem & modum usurpati, sunt sequentes:—Corpus nutrit, sanguinem probum generat, spiritus vitales recreat, semen auget, fœtum in utero firmat; quod nemo miretur, siquidem hoc subiectum, æmulam vini dulcissimi virtutem, ut porro docebo, in se complectitur, cujus proprietatem, in refectione longo morbo emaciatorum, senum, melancholicorum, moderatus usus comprobat; conducit affectibus faucium, pulmonum, raucedini, respirandi difficultati, ex defluxione acri abortis, exulcerationi item pulmonum, laterum, renum, vesicæ, purisque ex iisdem expurgationi; intestinorum asperitatem lenit, eorumque excrementa emollit, & expulsionem apparat; vulnera in corpus penetrantia & puncturas, ut etiam oculorum maculas, extergit; dolores ulcerum & tumorum, humores influxos coquendo, aut si ad suppurationem inhabiles sunt digerendo, dissipat; pluresque alios in medicina usus habet, brevitatis gratia prætermittendos. Saccharologiæ, part I. cap. 6. anno 1637.

“ Sugar, used in a proper manner, nourishes the body, generates good blood, cherishes the spirits, makes people prolific, strengthens children in the womb; and this is not astonishing, because
because

because it contains fimilar virtue to the very fweet wines; which property is fhewn by the effects, produced by the moderate ufe of fugar, in reftoring emaciated people, after long ficknefs; and ftrengthening the aged, and low-fpirited weak people.

“ It is ferviceable alfo in complaints of the throat, and lungs; hoarfenefs, and difficulty of breathing, arifing from an acrid defluxion; for ulcerations of the lungs, cheft, kidneys, and bladder; and to cleanfe thofe parts from purulent matter.

“ It eafes pains of the intefines, foftens the fæces, and prepares them for expulfion; it cleanfes wounds and punctures in the body; alfo films in the eyes.

“ It removes pains in ulcers and tumours, by concocting the flux of humours; or, if they have no tendency to fuppuration, by difperſing them.”

What I fhall further felect, together with the preceding, will fhew the eftimation in which fugar has been held, by learned men, at different periods, in different countries; and will embrace all that relates to it deferving notice.

BAPTISTA PORTA, who, in point of date, was much earlier than the authors before men-

tioned, must not be omitted; because his opinion of sugar was the prevailing one, prior and down to his time, all over Europe. Besides, as he lived at Naples, the use of sugar was better known to him, at that period, than to any contemporary writer in the northern parts of Europe; where it had then scarcely entered into dietic use. He says,—

Ex harundinibus saccharum extrahimus, non solum id incorruptibile, sed aliis præstat ne corrumpantur; vulneribus injectum à putrefactione liberat; ex eo solo ingentia vulnera sanari vidimus. Sit igitur familiare saccharum vitam prolongare cupientibus, quia nec humores, nec cibum in ventre putrescere, permittit. Phytognomica, lib. V. cap. 1. p. 201. anno 1560.

“ Sugar, extracted from canes, is not only incorruptible in itself, but preserves all other things from corruption; sprinkled upon wounds it keeps them from mortifying. I have seen very large wounds cured only with sugar *. Therefore sugar should be constantly

* The method of treating fresh wounds among the Turks, is, first to wash them with wine, and then sprinkle powdered sugar on them. The celebrated Monsieur BELLOSTE cured obstinate ulcers with sugar dissolved in a strong decoction of walnut leaves. This I have found to be an excellent application.

used by those who wish to prolong life; because it will not suffer the humours, nor the food, in the body to putrify."

POMET says, "The white and red sugar-candy are better for rheums, coughs, colds, catarrhs, asthmas, wheezings, than common sugar; because, being harder, they take longer time to melt in the mouth, and keep the throat and stomach moister than sugar does. Put into the eyes, in fine powder, it takes away their dimness, and heals them being bloodshot; it cleanses old sores, being strewed gently on them." *Histoire général des Drogues, Lib. II. cap. 38, anno 1694.*

LEMERY gives nearly a similar account of sugar; but says it is hurtful to the teeth, and causes vapours. *Traité universel des Drogues Simples, anno 1693.*

HERMANN says, "Sugar consists of a sweet soft mucilage, and an agreeable sharpness; from whence it becomes an aliment as well as a medicine. The Indians boil it in water with a small quantity of flower for nourishment. It promotes urine, and is specific in coughs, hoarseness, sharp humours, and other diseases of the lungs.

“ It should not be used in large quantities by the melancholic, hypocondriacal, and hysterical, nor by people in fevers, on account of its proneness to ascence.

“ With fat broth and *sal gem*, it is used in glysters for children; and it is also given to them, newly born, to relax the bowels, with oil of sweet almonds.

“ Taken with oil of sweet almonds, it is a remedy for pains in the bowels. It is an excellent vulnerary and balsamic, resisting putrefaction; it is good for putrid ulcers, and absterges clouds and films in the eyes. It is hurtful to the scorbutic, and to such as are subject to bilious colics. It is hurtful also to the teeth and gums; rendering the breath offensive, and the teeth black and rotten. In glysters it is good against worms, and is also an anthelmintic remedy taken by the mouth.” *Cynosura*, vol. I. p. 704 & seq. anno 1710.

BOERHAAVE says,—

“ Sugar never generates phlegm, but, on the contrary, dissolves it. Neither does it increase the bile, or is converted into it; but opens, attenuates, and divides it. At the same time, by dissolving the oleaginous particles in the body, it may induce leanness; and, by too much attenuation,

attenuation, produce debility, and too great laxity. For which reason, it is often found hurtful to the ricketty and scorbutic." *Element. Chemiæ, vol. II. p. 260, anno 1724.*

GEOFFROY says,

“ Sugar, taken moderately with food, affords good nourishment. It promotes concoction, if after a full meal a lump of it be eaten.

“ Almost all physicians recommend it in complaints of the chest and lungs. A lump of sugar or sugar-candy, held in the mouth, softens the acrimony of the phlegm, assuages coughs, and relieves rawness in the throat and fauces; as the sugar, so melting and swallowed, forms with the saliva a defence to the parts.

“ It promotes expectoration, particularly if reduced to the consistence of a syrup with the oil of linseed, or sweet almonds. Taken in this manner, it also eases the colic and pains in the bowels, and assuages the gripes in children.

“ Drinks, sweetened with sugar, cleanse the chest, and ease coughs by correcting the phlegm; they remove hoarseness, cleanse ulcers of the lungs, force the urine, open the bowels, and are salutary in the pleurisy and peripneumony.

“ But, if taken alone in a great quantity, it is hurtful, and particularly to bilious people. It ferments in the stomach and intestines, excites wind, and, by its fermentation, produces bile; and, by attenuating, renders it more fluid. Hence sugar and sweet things are said to create bile.

“ From the saline spiculæ of sugar, the bile is rendered more acrid; from which an heat is not only kindled in the bowels, but also in the whole body, and is carried into the mass of blood.

“ It creates worms in children.

“ It is hurtful to the teeth, causing blackness and scales, and making them loose. Therefore, always after using much sugar, it is proper to rinse the mouth and teeth carefully.

“ Nothing, however, is to be feared from the moderate use of sugar; but, on the contrary, we find that an agreeableness is added to our diet, by which the stomach is disposed to perform a proper digestion of the food; and the gastric fluid and the aliments are assisted, for the necessary fermentations, both in the stomach and the bowels; from whence the best quality of the blood, and other humours of the body depending on the first concoction, is produced.”

De Vegetabilibus, Sect. I. Art. 9, anno 1741.

In

In taking a survey of the writers on sugar, it is impossible to overlook Dr. FREDERICK SLARE; whose unqualified praises of the virtues of sugar may be properly opposed to the unqualified censures bestowed on it by GARENCIERES and WILLIS. Neither must honest old LIGON be forgotten.

“Sugar,” says LIGON, “has a faculty to preserve all fruits that grow in the world from corruption and putrefaction; so it has a virtue, being rightly applied, to preserve us men in our healths.”

“Dr. BUTLER, one of the most learned and famous physicians that this nation or the world ever bred, was wont to say;—

*If sugar can preserve both pears and plumbs,
Why can it not preserve as well our lungs*?*

“And, that it might work the same effect on himself, he always drank in his claret wine great store of the best refined sugar; and also prescribed it several ways to his patients, for

* The Doctor might have been a famous physician; but much is not to be said here, for his rhyme or his reason. The old adage is not left far behind by the Doctor;—

*That which preserveth apples and plumbs,
Will also preserve liver and lungs.*

colds,

colds, coughs, and catarrhs; which are diseases that reign in cold climates, especially in islands, where the air is moister than in continents." *History of Barbadoes, anno 1673.*

SLARE says,—“ I have a strong and home argument to recommend the use of sugar to infants; of which to defraud them is a very cruel thing, if not a crying sin. The argument I bring from Nature's first kind tribute, or intended food for children, so soon as they are born; which is, that fine juice or liquor prepared in the mother's breasts, called breast-milk, of a fine delicate sweet taste. This sweet is somewhat analogous, or a taste agreeable, to sugar; and, in want of this milk, it is well known, sugar is brought to supply it. You may soon be convinced of the satisfaction which a child has from the taste of sugar, by making two sorts of water-paps, one with, and the other without, sugar; they will greedily suck down the one, and make faces at the other. Nor will they be pleased with cow's milk, unless that be blessed with a little sugar, to bring it to the sweetness of breast milk.

“ I will set down an experiment I had from a friend. He was a little lean man, who used to drink much wine in company of strong drinkers,

drinkers. I asked him how he was able to bear it. He told me that he received much damage in his health, and was apt to be fuddled, before he used to dissolve sugar in his wine; from that time he was never sick nor inflamed, nor fuddled with wine. He usually drank red wine.

“ I made use of sugar myself in red wine, and I found the like good effect; that it prevents heating my blood, or giving my head any disturbance, if I drink a larger portion than ordinary.

“ I allow about two ounces of sugar to a pint of wine; and dare assert that this proportion will take off the heating quality of wine in a good measure; and, after one has some time used himself to add sugar to his wine, he will be pleased with the taste, and feel the comfortable and cordial virtue of this composition.

“ Let those that are thin, and apt to have hot hands and heated brains upon drinking wine, and cannot abstain or be excused from drinking, take notice of this counsel, and try it for some time; and they will be pleased with the delicious taste, and salubrious effects, of this saccharine addition.” *Vindication of Sugars, anno 1715.*

SUGAR, analytically examined, demonstrates phlegm, spirit, acid, and oil; and, by fermentation, yields an ardent spirit.

Two pounds of refined sugar produced one ounce and thirty-six grains of a limpid, inodorous, insipid phlegm; twelve ounces and six drams of a liquor at first limpid, then brownish and empyreumatic, then acid, and then urinous; and six drams of thin brownish oil.

The black residuary mass in the retort weighed eight ounces, two drams, and three grains; which, calcined in a furnace for fifteen hours, left one ounce, one dram, and ten grains, of brown cinders; from which two drams and forty grains of a fixed alkali salt were obtained by lixivium.

In the distillation there was a loss of eight ounces and six drams; in the calcination, seven ounces and fifty-three grains.

Sugar is an essential salt, consisting of an acid salt, oil, and earth. It shews no signs of acid or alkali. It takes flame, and burns brightly. It dissolves easily in aqueous menstrua, but not in spirituous or oily. Dissolved
in

in water; it undergoes fermentation, and acquires first a vinous, then an acetous flavour.

If one pound of sugar be dissolved in six or eight pints of water, and a spoonful of the yeast of beer be added to it, and well mixed, and exposed to gentle heat, in a vessel properly closed, but the vessel must not be full, in a few hours it will begin to ferment with great vehemence; and in three or four weeks, more or less, according to the quantity of liquor, and warmth of the situation where it is placed, it will produce a strong vinous liquor, not unlike honey and water. This liquor distilled yields a strong ardent spirit. If the whole fermenting materials be exposed longer to a continued heat, a strong vinegar, like that of wine, will be produced; by the liquor changing from its vinous to its acetous state.

Among more recent chemical investigation, and in the higher elementary branches of chemical science, discoveries have been made important to arts and manufactories: and also for the œconomical purposes of life. Sugar has not escaped that scrutiny, which the magnitude of such a subject demanded.

The

The renowned BERGMAN gives us the following new and interesting observations :

“ Sugar being justly considered as an essential salt, it will readily be granted, that it contains an acid ; this acid may be separated, and exhibited in a crystalline form, by the following process :—

“ (A) Let one ounce of the purest sugar, in powder, be mixed, in a tubulated retort, with three ounces of strong nitrous acid, whose specific gravity is nearly 1,567.

“ (B) When the solution is completed, and the most phlogisticated part of the nitrous acid has flown off, let a receiver be luted on, and the solution gently boiled. In this process an immense quantity of nitrous air is discharged*.

“ (C) When the liquor acquires a dark-brown colour, let three ounces more of nitrous acid be poured on, and the boiling continued until the coloured and smoking acid has entirely disappeared.

“ (D) Let the liquor in the receiver be then poured into a larger vessel ; and, upon cooling, small quadrilateral prismatic crystals are

* In order to procure this acid, common aqua-fortis will serve as well as the strongest nitrous acid ; and any glass, thin enough to bear a moderate heat, will do as well as a retort.

found adhering together, at an angle generally of about 45 degrees: these, collected and dried on bibulous paper, weigh 109 grains.

“(E) The remaining lixivium, boiled again in the same retorts, with two ounces of nitrous acid, until the red vapours begin to disappear, upon cooling, as before, affords 43 grains of saline aciculæ.

“(F) If to the viscid glutinous liquor which remains, there be added, at different times, small quantities of nitrous acid, amounting in all to two ounces, by boiling and evaporating to dryness, a saline mass is at length formed, brown, glutinous, and deliquescent, which, when perfectly dried, weighs half a drachm; but in depuration nearly half of this weight is lost.

“(G) The crystals obtained in the manner above described, are to be depurated by repeated solution and crystallization; an operation which is particularly necessary to the portion got, as described in (F).

The last lixivium (F), digested with nitrous acid, and evaporated to dryings by the sun's heat, exhibits prisms similar to those mentioned, (D) and (E); so that this affords a method of abridging the number of depurations.

“(H)

“(H) To obtain, therefore, one part of this salt, there are required 3 of sugar, and 30 of nitrous acid. Thus it may be reckoned among the most expensive salts hitherto known.

“It must be particularly observed, that a much smaller quantity of crystals will be obtained, if the boiling be continued ever so little beyond the proper time.

“(I) The acid thus obtained I call *acid of sugar*; not because it is procurable from that substance only, but because sugar affords it more pure, and in greater quantity, than any other matter hitherto tried.

“Thus 100 parts of gum arabic, treated as above, with 900 of nitrous acid, at the beginning of the boiling foam violently, and, upon cooling, yield scarce more than 21 of saccharine acid, prismatically crystallized; but at the same time the solution, even to the last, separates a saccharated lime, which, when collected, weighs 11, and contains about 5 of the acid of sugar: 8 parts of highly-rectified spirit of wine, with 24 of nitrous acid, yield 3 of saccharine acid, but, for the most part, in a squamous form, and loaded with much moisture; besides, honey, and whatever substance contains sugar, in the same way, produces the same

same acid; and although acid of tartar, dissolved and boiled in nitrous acid, in the same manner, yields a salt somewhat similar to this, both in taste and squamous crystallization, yet it is of a whiter colour; and, besides, is unchangeable in the fire, yielding only a coal as before.

“ In another dissertation it will be shewn that the acid of sugar occurs also in animal substances.

“ This salt possesses many properties; some peculiar to itself, some common to it with other acids, though differing more or less in degree: and these we are now to consider.

“ (A) The crystals have an exceeding pungent taste; but a solution of these, when sufficiently diluted, excites a very agreeable sensation on the tongue. Twenty grains communicate a sensible acidity to a quart of water.

“ (B) It makes red all the blue vegetable juices, except that of indigo. A single grain dissolved in four ounces of water instantly makes red the blue paper for covering sugar-loaves; which is not affected by the weaker acids: and twelve grains, dissolved in a quart of water, produce the same effect upon paper tinged with turnsole.

“(C) It attacks alkalis, earths, and fundry metals; and dissolves them with effervescence, if they be united with aërial acid. These combinations serve to distinguish this evidently from all other acids.”

SACCHARATED LIME*.

“Eighty-two parts of saccharine acid take up 100 of pellucid calcareous spar, but not immediately; because the surface, when saturated with the acid, prevents the access of the acid to the internal nucleus. Nitrated lime is completely precipitated by acid of sugar, in the form of a white powder, not soluble in water.

“Of 119 parts, by weight, of this powder, 72 fall to the bottom, and 47 appear upon evaporation: hence it is shewn, that 100 parts contain, of acid 48, of pure lime 46, and of water 6; so that not only the presence of lime in water is discovered by acid of sugar, but even its quantity may, without difficulty, be ascertained.

“The saccharine acid attacks lime with such force that it separates it from every other: this

* This section is of importance to manufacturers of sugar, and analysts of waters.

combination, therefore, cannot be decomposed by any acid, alkali, or earth, hitherto known, and can only be decomposed by fire.

“ Hence also we understand the necessity of lime-water in the purification of sugar; for, the juice of the cane contains a superabundance of acid, which prevents the dry concretion; and even if to pure sugar dissolved in water be added the saccharine acid, it will not form crystalline grains.

“ Now, nothing more powerfully attracts this acid than lime; and, when united with it, it is insoluble, and either falls to the bottom, or floats in the scum. Lime-water, therefore, affords the most complete means of effecting the crystallization; as it removes the impediment, and, besides, may easily be added in any proportion, without communicating any heterogeneous matter.

“ Many persons have thought that a portion of the lime remains mixed with the sugar; but, if the purification be properly conducted, the nature of the ingredients, the circumstances of the operation, and, finally, the most accurate analysis, abundantly shew, that there is not the smallest trace of lime remaining.

“ Good sugar dissolves totally in distilled water; which could not possibly be the case if

there were present any lime, either crude or united with the saccharine acid; as either of these substances, whether alone or mixed with sugar, is utterly insoluble in water*.

“The vegetable alkali does indeed absorb the acid of sugar, but forms with it a salt not very difficult of solution; and, besides, a caustic lixivium, if used in too great a quantity, will dissolve a portion of the sugar. In saccharated lime, the earthy basis predominates: for, when boiled with syrup of violets, it strikes a green colour.

“If we consider the nature of the acid of sugar, we shall find that it does not resemble the nitrous acid in any other instance than those properties which are common to all acids; besides, it expels the nitrous acid from lime, terra ponderosa, magnesia, and metals; yielding to the other acids nothing but alkalis; while the nitrous acid produces salt, either deliquescent or easily soluble, acid of sugar yields such as are scarcely soluble in water.

“Alkalis, when nitrated, detonate with ignited phlogiston; but, when saccharated, shew not the least signs of deflagration, which they

* The idle opinions respecting lime, used in manufacturing sugar, are here completely refuted. Lime holds the first place, in an eminent degree, in the elective attractions of the acid of sugar.

evidently

evidently do upon the addition of the smallest particle of nitrous acid.

“The nitrous acid corrodes tin and antimony, but scarcely dissolves them; while acid of sugar readily acts upon them: phlogisticated nitrous acid, united with vegetable fixed alkali, deliquesces, does not form crystals, and is readily expelled by vinegar, or even by acid of sugar, still more loaded with phlogiston: all which circumstances by no means take place with respect to the fixed vegetable alkali united with acid of sugar.

“Many other dissimilarities will occur upon comparison; so that these acids are of a nature not only unlike, but in many instances diametrically opposite.

“If any will attribute all the difference to phlogiston, I will not deny that that subtle principle forms a wonderful source of difference; but the difference which takes place here can by no means be attributed to this, when properly examined.

“The nitrous acid is weakened, and made far more volatile, by union with the phlogiston; the acid of sugar much more fixed, even when loaded with so great a quantity as to be crystallizable; it almost every where expels the strongest nitrous acid, as experiments shew;

besides, the phlogisticated nitrous acid produces, with the very same matters, compounds totally different from those with acid of sugar.

“ Nothing can be judged from circumstances which are unknown, forged, or, at best, possible: and among all the facts yet known, concerning the acid of sugar, we can find no signs of its being derived from the nitrous acid.

“ However, let us enquire more deeply; let us principally consult nature, not indifferently and slightly, supplying the deficiencies with fiction, but candidly and properly, by apt and accurate experiments; otherwise her answers, like those of the oracles of old, will be either delusive or ambiguous.

“ But, by whatever means the acid of sugar is produced, it must be considered as distinct, and different from all others, being always essentially and specifically the same. Its singular properties, some of which are of considerable use in chemistry, shew that it deserves the most particular attention.

“ From the time of STAHL, many considered the nitrous and marine acids as generated from the vitriolic; but, if all confiding in this theory (which yet is contradicted by daily observation) had neglected the examination of those acids,

acids, considering them as subordinate and derivative, we should be to this day ignorant of many singular facts, which, by degrees, were discovered; principally because many considered these acids as distinct and separate substances*.”

The saccharine matter, says the illustrious DE FOURCROY,—“which many chemists consider as a kind of essential salt, is found in a great number of vegetables; and may be properly ranged among their immediate principles.

“The maple, the birch, the red beet, the parsnip, the grape, wheat, &c. contain it. MARGRAFF extracted it from most vegetables. The petals of many flowers, and the necta-

* Abbé FONTANA has obtained an acid perfectly like that of sugar, and saccharine substances, from all gums and resins. Mr. WATT, of Birmingham, found by adding nitrous acid to galls, and conducting the process in the way recommended by professor BERGMAN, that these astringent bodies contain the acid of sugar in greater abundance than the substance from which it derives its name. Mr. SCHRIKEL obtained an acid from galls by distillation, but very different from BERGMAN'S; as may be seen in SCHEEL'S essays. To obtain acid of sugar, without vital air, or nitrous acid, would be a fact of great importance in the present state of chemical theory.

riums placed in these organs, elaborate a principle of this kind.

“ The sugar cane, *arundo saccharifera*, contains it in larger quantities, and affords it more readily, than any other plant.

“ Sugar consists of a peculiar acid united to a small quantity of alkali, and much fat matter. It crystallizes in hexahedral truncated prisms; and in this state is called sugar-candy. By distillation it affords an acid phlegm, and a few drops of empyreumatic oil. The residue is a spongy light coal, which contains a small quantity of vegetable alkali. This salt is inflammable. On hot coals it melts, and swells up very much, emits a penetrating vapour, and becomes converted into a brown yellow matter. It is very soluble in water, to which it gives much consistence, and constitutes a kind of mucilage, called syrup. Syrup diluted with water is capable of fermentation, and affords ardent spirit.

“ BERGMAN has obtained, from all saccharine matters, especially sugar, an acid of a peculiar nature.

“ Though, at the time of the first discovery of this acid, it was thought that the saccharine principle was necessary for its formation *,

* *Manna* affords an acid of the same nature.

it is at present known, that a great number of vegetables, which are not saccharine, afford it in greater abundance : such are gums, starch, vegetable gluten, salt of sorrel, lemon juice, spirit of wine, and animal matter, as M. BERTHOLLET has discovered.

“ Among these substances, those which produce the greatest quantity of this peculiar acid, by the action of spirit of nitre, are such as do not afford sugar.

“ Pure sugar did not afford BERGMAN more than one third of its weight of acid ; and M. BERTHOLLET obtained more than half, from wool.

“ It seems, therefore, as M. DE MORVEAU thinks, that this acid is formed by the union of a peculiar attenuated oil, which exists in all organic substances, and is the same throughout ; and that consequently the name of saccharine acid is improper.

“ SCHEELE has observed that the acid of lemons crystallized by the process described by BERGMAN, does not afford saccharine acid by treatment with nitrous acid ; though lemon juice itself affords it. The vitriolic acid, employed for the purification of this acid of sugar, seems therefore to decompose the oil which forms the base of the saccharine acid.”

The

The saccharine principle of grapes, berries, and fruits, is the basis of their respective wines ; therefore almost every description of wine may be imitated by art, from sugar.

The wines of France, Italy, Spain, and Portugal, particularly of the two last countries, are not only adulterated, but successfully counterfeited from sugar.

They who understand perfectly that part of the manufacture which belongs to colouring the liquor, and giving it the essential characteristic of the relative vegetable flavour, can deceive people of no mean judgment and sell them a cask of wine “ *neat as imported.*”

Of other vegetable juices abounding with sugar, LEWIS has given the following description, in his translation of NEWMANN'S chemistry :

“ In some parts of North America, particularly in Canada, a kind of sugar is prepared from the juice which issues upon wounding or boring certain species of the maple tree, one of which is named from hence the sugar-maple ; as also from the wild or black birch, the honey locust,

locust, and the hickery. The maple is most commonly made use of for this purpose, as being the richest, and as best enduring the long and severe Winters of that climate. The juice is boiled down, without any addition, to a thick consistence, then taken from the fire, kept stirring until its heat is abated, and set in a cold place, where the sugar quickly concretes into grains, resembling common brown powder sugar.

“ The trees are tapped early in the Spring, about the time the snow begins to melt. It is observable, that when the weather begins to grow warm they bleed no more; and that after the bleeding has stopped they begin to run again upon covering the roots with snow. The more severe the Winter has been, the juice is found to be richer, and in greater quantity. The trees which grow on hills, or high land, yield a richer juice than those which are produced in low countries; and the middle-aged than the young or old.

“ Mr. KALM informs us, in the Swedish Transactions for the year 1751, that one tree, if the Summer does not come on hastily, will yield about forty-two gallons of juice, English measure: and that the quantity which issues in one day is from three to six gallons; that eleven
gallons

gallons of juice of middling quality give a pound of fugar, and that a pound has been gained from three gallons and an half. That two persons can, in one Spring, prepare commodiously two hundred pounds. He observes, that this fugar is weaker than that from the fugar-cane; and that it is reckoned that a pound of common fugar goes as far in sweetening as two pounds of maple fugar.

“ The large maple, commonly called fycamore-tree, bleeds also in Europe; from which an actual fugar has been prepared. In the Transactions above mentioned, for the year 1754, there is an account of some experiments made in this view upon the Swedish maple. Eight trees, none of them under thirty years, bled, in four days, fourteen gallons of juice, which inspissated gave two pounds and an half of brown fugar. Another time, the same eight trees bled, in three days, ten gallons and an half, which yielded one pound four ounces of fugar, with half a pound of fyrup. It is the saccharine juice of the maple-tree, which, exuding from the leaves, renders them so apt to be preyed upon by insects.

“ The common birch bleeds also a large quantity of sweetish juice, which yields, on being inspissated, a sweet saline concrete, not
however

however perfectly of the saccharine kind ; but seeming to approach more to the nature of manna.

“ There are fundry other vegetables, raised in our own country, which afford saccharine concretes ; as beet-roots, skirrets, parsneps, potatoes, celery, red cabbage-stalks, the young shoots of Indian-wheat. The sugar is most readily obtained from these, by making a tincture of the subject in rectified spirits of wine ; which, when saturated by heat, will deposit the sugar upon standing in the cold *.”

We have now some rational data concerning the real principles of sugar ; from which it may be suggested, that it has not even yet been so fully investigated, but that it may be applicable in many ways, more than we are at present acquainted with, to a variety of interesting purposes.

But, before I proceed in the observations I have to offer the public on the dietetic and medicinal uses of sugar, it may be proper to

* Sugar is also obtainable from grapes ; particularly from dried raisins. We frequently find large grains of pure sugar among *Malaga* raisins, that have lain long compressed together.

submit some remarks, the result of my literary researches, to the learned and curious. This may contribute to settle many vague notions and erroneous opinions relative to the heraldry of sugar, and the cane, of which it is the produce.

I have before observed, that the ancient Grecians and Romans had no knowledge either of the sugar-cane, or of sugar.

For, there is no mention made of the SUGAR-CANE among the Grecian writers, until an hundred years after HIPPOCRATES; nor among the Roman writers, until the time of POMPEY'S expedition into Syria.

SUGAR is not mentioned by either Grecian or Roman writer until the time of NERO. Neither poet nor historian mentions it in the Augustan age.

In the districts of Asia, inhabited by the Hebrews and Israelites, at the time that country was traversed by the Grecians and Romans, sugar was there unknown.

There is no record among the Jews, even so late as at their dispersion, on this subject.

From the writers on the expedition of the Crusaders but little is to be collected respecting the sugar-cane, and less of sugar; notwithstanding sugar had been a commercial article
for

for centuries prior to that memorable epoch of infanity*.

In the writings of MOSES, and in many parts of the Bible written by others, we find the word קנה.

This word, passing into the Arabic language, كناة *kænat*, is the immediate origin of *canna*, a cane. Pl. كنا *kænā* — *cannæ*, canes.

But this קנה in the Bible has many significations.

As a verb in the Hebrew, it imports to buy; procure; possess. קנה *kanah* he bought; he procured; he possessed. קנה *kaneh* as a noun, a spear †; a staff ‡; a reed, or rush §; a balance ||; bone of the arm ¶; branches of the candlestick in the temple**.

It is said by several writers, that by קנה, in some places in the Bible, the *sugar-cane* is meant; and consequently that this plant was known to the antient Hebrews. This is to

* *Histoire du Commerce de Venise*, p. 71, 100.

† *Psalms*, lxxviii. v. 30. קנה *kanah* *bastæ*. 2 *Samuel*, c. xxi. v. 16.

‡ *Ezekiel*, c. xxix. v. 6.

§ *Isaiah*, c. xix. v. 6, 7. and c. xlii. v. 3. 1 *Kings*, c. xiv. v. 15, 2 *Kings*, c. xviii. v. 21. *Job*, c. xl. v. 21. *Ezekiel*, c. xl, c. xli. c. xlii. c. xlv.

|| *Isaiah*, c. xlvi. v. 6.

¶ *Job*, c. xxxi. v. 22. the *ulna*.

** *Exodus*, c. xxv. v. 32.

our present purpose, and the first object of inquiry.

In five places only, in the Bible, this word occurs, as a noun, implying an article, or vegetable production; to which any use, or application, is assigned as such.

These places are in *Exodus*, c. xxx. v. 23. *Canticles*, c. iv. v. 14. *Isaiab*, c. xliii. v. 24. *Jeremiah*, c. vi. v. 20. and *Ezekiel*, c. xxvii. v. 19.

If we examine the passages here referred to, we shall find that קנה has been doubtfully interpreted at best; evidently erroneously in some instances; and in none is it possible that the *sugar cane* could be meant by it.

In the preceding chapter in *Exodus* we find,—

קִנְמֹן בְּשֵׁם—קָנֶה בְּשֵׁם

Kinnemon besem,—kaneb besem.

This is rendered in the Septuagint version,

Κινναμωμον ευωδες—καλαμος ευωδης.

The Latin versions in the Polyglotts have it, *Cinnamomum odoriferum*, and *calamus odoriferus*.

In

In our English Bible it is, “sweet cinnamon and *sweet calamus*.”

In some of the Latin versions the קנה בשם is rendered *calamus beneolens*, and *calamus aromaticus*.

Again, in the *Canticles*, both *kaneh* and cinnamon are mentioned, as distinct articles;

קנה וקנמון

Καλαμος και κινναμωμον *

The Latin versions have this, *calamus aromaticus et cinnamomum*; and *fistula et cinnamomum*: קנה is also rendered *canna* in one version of the Polyglott †, as it is in MONTANUS ‡. Our English Bible has it “calamus and cinnamon.”

In *Isaiab*, this *kaneh* appears to be highly grateful to Jehovah, who is represented by him as being angry with the Israelites, for neglecting their burnt offerings and sacrifices.

לא קנית לי בכסף קנה

In our English Bible this passage is,—

* C. iv. v. 14.

† WALTON. *Interpret. interlin. à PAGNINO.*

‡ *Ibid.*

“Thou hast bought me no *sweet cane* with money *.”

This is the passage which has misled so many people: from *kaneh* being erroneously rendered *sweet cane*.

Jeremiah represents Jehovah, as being angry with the Israelites; and will not receive their burnt offerings, and sacrifices. Here also the *kaneh* is mentioned by Jehovah, as an article of the first consideration.

וְקִנְיָהּ הַטּוֹב מֵאֶרֶץ מְרֹחֵק

The whole verse is thus rendered in the English Bible.

“To what purpose cometh there to me incense from Sheba? and the *sweet calamus* from a far country? Your burnt offerings are not acceptable to me, nor your sacrifices sweet unto me †.”

The Septuagint has the part of the verse I have quoted from the Hebrew, *κινναμωμον εκ γης μακροθεν*. “CINNAMON from a far country.”

* C. xliii. v. 24.

† C. vi. v. 20.

In the Latin versions it is rendered *calamus suaveolens de terra longinqua*; and *cinnamomum de terra longinqua*; and *calamus aromaticus de terra longinqua*.

It is necessary to observe here, that, in the Septuagint, קנה is converted into κινναμωμον, *cinnamon*; which word is not in the original text; and the epithet טוב *tōb*, good, perfect, best, is entirely omitted.

These are errors in the labours of those great men, who first took the Hebrew Bible out of the hands of the Jews, and gave all that is known of it to posterity.

But these errors have led some writers, who knew no more of קנה than what they obtained from this passage in the Bible, to suppose it was a synonyme for cinnamon.

In *Ezekiel*, we find the *kaneh* enumerated by Jehovah, among the boasted commodities of merchandize at Tyre, in her most flourishing state of commerce.

קנה וקנה במערבך היה :

“Cassia and *calamus* were in thy market*.”

In *Exodus*, *kaneh* is mentioned by Moses as one of the four spices in the *Holy Anointing Oil*;

* C. xxvii. v. 19.

which, he says, Jehovah ordered him to make in the following manner :

“ * Take thou unto thee, principal spices of pure myrrh 500 shekels ; sweet cinnamon and *sweet calamus*, of each 250 shekels ; cassia 500 shekels ; and of olive oil an *bin*. And thou shalt make it an oil of Holy Ointment, to be made an ointment compound, after the art of the apothecary †.”

With this *Holy Anointing Oil*, MOSES says, he was directed by Jehovah to anoint the tabernacle, the ark of the testimony, the tables, the vessels, the candlesticks, the altar of incense, the altar of burnt offering, and the laver and his foot, that they might be sacred ; he was also ordered to anoint AARON and his sons, and consecrate them, that they might minister in the priests office ; and it was to be an *Holy Anointing Oil* for the children of Israel throughout their generations.

MOSES, in this remarkable chapter, mentions also the other composition, so venerated by the Israelites. This is the *Holy Perfume* ; which, he says, Jehovah directed him to make in the following manner, for perfuming the Tabernacle. “ Take unto thee sweet spices, stacte,

* C. xxx. v. 23.

† קַרְבָּן an apothecary, or compounder of sweet ointments.

and onycha, and galbanum; these sweet spices, with pure frankincense, of each shall there be a like weight.”

“And thou shalt make it a perfume, or confection, after the art of the apothecary, tempered together, pure and holy *.”

This *Perfume*, like the *Holy Oil*, was not to be used for profane purposes, nor even to be imitated. For, whosoever should attempt to make either, or put any of the oil on a stranger, or smell to a perfume compounded in a similar manner, was, MOSES says, by Jehovah’s decree, to be “even cut off from his people.”

The ancient Jews delighted in spicy odours. MOSES made fumigation, and the use of aromatic drugs, part of their religion.

They used them even in their beds:—

נִפְתִּי מִשְׁכְּבִי כֹר אֶהְלִים וְקַנְמוֹן:

“I have perfumed my bed with myrrh, aloes, and cinnamon †.”

The ingredients they used were indeed coarse, but wholesome. By fumigation and perfumes, they corrected the foul air in their tabernacles, and other places where many dirty

* V. 34, 35.

† *Proverbs*, c. vii. v. 17. English Bible.

people were crowded together; by which means diseases were prevented.

This doctrine of fumigation is one of the many excellent lessons in the Bible, which has been much neglected.

It seems to have arisen from perverseness among Christians, hatred to the Jews, and disrespect to MOSES, who knew all sciences, and was an excellent physician, that they have profited so little by several wise practices, as well as precepts, in the Bible. The papistical Christians, it is true, burn frankincense in their churches; but it is chiefly near the altar, where the priest only is benefited by it.

The Christians in England cleanse their houses and public places by water, heated air, and ventilation; and hence it is we have to lament, that often the best Christians die of consumptions.

In England the Christians are much cleaner than they used to be. They would now call a man,—

“ Misbeliever, cut-throat dog, and spit upon his gaberdine *,”

if he were to advise their taking an hint for purifying their persons, or places of devotion, after the manner of the Israelites.

* *Shylock.*

But I must finish my observations on *kaneb*.

What this קנה was, I know not. It could not be the *acorus*, or *calamus aromaticus*; that was too plentiful to be so valued; and grew in Syria, Arabia, and the islands of the Gentiles, and in all the swamps and marshes in the adjacent countries to the land of Israel; and was not brought מארץ מרחק “from a far country.”

That the *kaneb* was some spicey produce of a tree, concretion, bitumen, wood, bark, or gum, is certain; and it is also certain that it was not only aromatic, but precious, from the epithets given to it, and from its uses among the chosen people, and the estimation in which it was said to be holden by Jehovah himself.

The epithet קשם imports *spicey, sweet scented*, not *sweet tasted*; therefore the *sugar cane* is entirely out of the question.

The *sugar cane* does not yield a fragrant smell, naturally or burnt. Neither will it keep sound, when ripe, after it is cut; but will perish like the stalk of a cabbage-plant; and could not be preserved from rotting in a passage “from a far country*.”

* Neither did cinnamon come “from a far country.” That was the produce of Arabia. “Habet India, quæ Australis est, cinnamomum sicut Arabia.” STRABO, lib. XV.

How קַנֶּבֶת should have been rendered *calamus*, so universally as it has been, I cannot conceive.

The authors of the Septuagint translation of the Bible must have understood, from the time and countries in which they lived *, the Hebrew language better than any people at this day. But here they have misguided their implicit followers; and, indeed, this is not the only instance where they were not so correct as they should have been.

We find among the Greek writers *καννα*, *δοναξ*, and *καλαμος*; and among the Roman writers *canna*, *arundo*, and *calamus*;—but these names are used indiscriminately for a *cane*, or a *reed*.

This has been the cause frequently of misunderstanding these writers; where the context has been inadequate to settle a precise and determinate meaning.

The *γλυκοκαλαμος*, in later times of NICHOLAS MYREPSUS, which his translators have rendered *dulcis calamus repurgatus*, is the pulp of the *cassia fistula* †.

* About 227 years before the Christian æra.

† *De Antidot. Sect. 1. c. 449. anno 1280.*

It has been said, by some writers, that the word שכר in the Bible has an allusion to sugar.

This word, like קנה according to the construction of the Hebrew language, has several significations; but none whatever that has any relation to sugar.

As a verb, it imports to drink to excess; to be drunk; to hire for wages; to reward. שָׁכַר *shakar*, or *shacar*, he drank to excess; he was drunk. שָׂכַר *sachar*, he hired for wages; he rewarded.

As a noun, it has various meanings; but is chiefly used for some exhilarating, strong, and intoxicating liquor. Our English Bible every where denominates it, “strong drink.”

The Septuagint renders it σικερα*, σικερα†; the Latin versions *sechar*, *ficera*.

MOSES says, Jehovah ordered him to proclaim to the children of Israel, that “when either man or woman shall separate themselves to a vow, a vow of a Nazarite, he shall sepa-

* Numbers, c. vi. v. 3. *Isaiab*, c. xxix. v. 9.

† Numbers, c. xxviii. v. 7.

rate himself from wine, and שֵׁכָר (*shecar*) *strong drink*; and shall drink no vinegar of wine, or vinegar of שֵׁכָר (*shecar*) *strong drink*; neither shall he drink any liquor of grapes, nor eat moist grapes, or dried *.”

The inspired prophet JEREMIAH says, Jehovah gave him “the cup of his fury;” and that he “made all nations drink of it, to whom the LORD had sent him;” and he said unto them, “drink ye, and be וְשִׁכְרוּ (*veshikru*) *ye drunken*, and spue, and fall †.”

These passages are here given, the original Hebrew words excepted, from the English Bible †; which, though not an elegant, is in this instance a faithful translation of the Hebrew.

What fottish liquor שֵׁכָר *shecar* was, no person knows. It was probably made from grain; perhaps from honey.

The most wild and barbarous nations have ever had the art of making intoxicating liquors to get drunk with, by some process of fermentation, from saps of trees ‡, fruits §,

* *Numbers*, c. vi. v. 3.

† *Jeremiah*, c. xxv. v. 27.

‡ *Palm, Birch, Laudan, Sycamore, &c.*

§ *Apples, Pears, Cherries, Currants, Gooseberries, Plums, Mulberries, Elderberries, Blackberries, Ocayba, &c.*

and

and grain * ; and from roots, and other natural productions of different countries.

The sugar cane, though indigenous to latitudes within and near the torrid zone, arrives at excellence only in the hottest climates. But much rain, or water, as well as sun, is necessary to its maturity.

When we consider that the saccharine principle is the soul of vegetable creation, and see how sparingly it is diffused through the general productions of the earth; and how little is collected from the wide range of flowers, by the consummate skill of the laborious bee; or from roots, trees, fruit, and grain, by the chemic art; we cannot but admire the partiality of Nature to the luscious CANE, her favourite offspring, the sublimest effort of heat and light.

The proportion of sugar to the cane juice, depends on the quality of the cane †. We consider a pound of sugar from a gallon of cane juice, as good yielding; and three hogheads of sugar, of 14 cwt. each, from an acre of land, as ample produce. But for this quan-

* *Wheat, Barley, Oats, Millet, Rice, Maize, Teca, &c.*

† See p. 23.

tity, the foil must be good, and the canes of the first year's cutting, and in perfection.

In the process of refining muscovado sugar, a ton weight, of good quality, gives the following products :—

	Cwt.	q.	lb.
Double, and single refined sugar,	9	1	$5\frac{5}{8}$
Piece ditto,	4	0	0
Scale, or bastard ditto,	2	0	0
Melasses, or treacle,	4	1	22
Scum, and dirt,	0	1	$0\frac{1}{6}$
	<hr/>		
	20	0	0
	<hr/>		

That sugar is nutritious in the most eminent degree has been long known. It is the basis of all vegetable nutrition.

Every root and earthly production is nutritious, in proportion to the saccharine principle it contains. Nothing nourishes that is entirely free from this saccharine principle; otherwise, turnips would be as little nutritive as cucumbers, being, like them, the sugar excepted, scarcely any thing but water.

Milk is nutritious on the same account; and that milk is most nutritious which most abounds with saccharine sweetness; and when milk is defective in this quality, from bad pasturage
and

and other causes, our vegetable sugar should be added to it, to remedy such defect.

In all cases sugar helps the assimilation of milk in the stomach; and not only prevents its curdling, and disordering that organ, but corrects the tendency which milk has to injure the breath, by adhering to the teeth and gums, and rendering them foul and offensive.

There are many people to whom a milk diet would be a great convenience and gratification; and there are some habits of body and disorders wherein it would often be of the utmost utility; but the stomach frequently is unable to bear it. Here sugar is the only means to reconcile the disagreement.

A learned and worthy relation of mine, having been much afflicted with the gout, and having seen the good effects of a milk diet in similar cases to his own, wished to have recourse to it in the same manner, and make it a principal part of his sustenance; but he could not. It curdled, and became sour, heavy, and disgusting in his stomach. He was always very fond of milk, but never could use it without inconvenience, even when he was a boy.

However, on reading the former edition of this work, he was determined to have another
trial

trial of milk, with the addition of some sugar. This succeeded, and he now makes two meals every day entirely on milk and bread, with great pleasure and comfort; and with infinite advantage to his health.

As milk has the property of injuring the teeth, and is much used in schools, and constitutes great part of the sustenance of most young people, a tooth-brush and water should always be employed; or at least the mouth should be well rinsed with water, after a meal made of milk.

No modern physicians have noticed this; but the ancients were well acquainted with the injurious effects of milk, on the teeth and gums*.

In regard to sugar being prejudicial to the teeth, this has long been known as a prudent old woman's bug-bear, to frighten children; that they might not follow their natural inclination, by seizing opportunities, when they

* P. ÆNIGETÆ, lib. I. c. 86. Lac gingivas & dentes lædit. Quare post ipsum acceptum, primum aqua mulsa, deinde vino adstringente, os colluere oportet.

ORIBASII à GALENO Medicin. Collect. lib. II. c. 59.—Mirum in modum usus lactis frequens dentes & gingivas lædit, nam gingivas flaccidas, dentes putrefactioni & erosioni obnoxios facit: ergo sumpto lacte, os vino diluto colluendum est; erit etiam accommodatius si mel eidem adjicias.

are not watched, of devouring all the sugar they can find.

This story has had a good effect among the common people in Scotland. They are impressed with a notion that *sweeties* hurt the teeth; therefore they live contented without an article, not always within the compass of their finances.

SLARE, and many others, used sugar as a principal ingredient in tooth powders. It is a component part of many pastes, and other dentrifices; and what the French call *opiates*, for the preservation of the teeth and gums.

When milk is not the sole diet of children at their mother's breast, sugar, in various mixtures and vehicles, makes the chief portion, essentially, of their support.

Sugar affords great nourishment, without oppressing their tender powers of digestion. The nutritive principle of their natural food, is thus happily imitated.

Sugar does not create worms in children, as has been often said: on the contrary, it destroys worms. Some writers have mentioned this*; but my authority is my own observation.

* *Act. Med. Leip. anno 1700.*

In the West Indies, the negro children, from crude vegetable diet, are much afflicted with worms. In crop-time, when the canes are ripe, these children are always sucking them. Give a negro infant a piece of sugar cane to suck, and the impoverished milk of his mother is tasteless to him. This salubrious luxury soon changes his appearance. Worms are discharged; his enlarged belly, and joints diminish; his emaciated limbs increase; and, if canes were always ripe, he would never be diseased.

I have often seen old, scabby, wasted negroes, crawl from the *hot-houses*, apparently half dead, in crop-time; and by sucking canes all day long, they have soon become strong, fat, and sleeky.

The restorative power of sugar, in wasted and decayed habits, is recorded by several physicians, in different parts of the world. I have known many people, far advanced in pulmonary consumption, recovered by the juice of the sugar cane.

A friend of mine, a clergyman in Shropshire, has favoured me with a very interesting account of a cure performed by the use of sugar, in such a diseased state of the lungs, as
is

is generally denominated a complete consumption.

The case is curious; and I shall recite as much of it as is necessary to the fact. The patient is a gentleman, and a neighbour of my friend. He had been attended by two eminent physicians who had given up the case as incurable. He then applied to the late Doctor JAMES, who ordered one paper of his powder to be divided into eight parts, and one part to be taken every other night, diluting with strong green tea. After being a week under this treatment, he was taken out of his bed every morning between nine and ten o'clock, and supported by two persons, was hurried along the garden-walk, when the weather was fine, which brought on expectoration, and retching; when the oppression from his lungs was removed by these operations, he was put into his bed again, and had a tea-cup full of milk-warm mutton broth given him; this excited a gentle perspiration, and pleasant sleep. He was allowed calves feet, chicken, fish, and a glass or two of port wine. This was JAMES's practice.—The patient thought himself benefited by it.—He was at this time so reduced that he kept his bed upwards of two months, not being able to stand; nor

even to sit upright in a chair without support; his cough was violent, with bloody purulent spitting, fever, and profuse, and sudden night sweats. He was then twenty-six years of age.

His disorder originated from sleeping with his bed-room window open, in the month of June, 1770; and increased to an alarming degree by the month of August; and in March, 1771, the above physicians gave over all hopes of his recovery. These things premised, I shall give the gentleman's own words, in answer to some particulars stated to him, by my desire.

“ I did not take to the use of sugar, until I was reduced to so weak a condition as to be unable to take any thing else. Sugar was never prescribed for me by any physician; but being very thirsty, from the fever, I had a great inclination for spring water; which I was not permitted to have, by the affectionate relative who nursed me, without some Muscovado sugar, a little ginger, and a piece of toasted bread in it. I soon became extremely fond of the saccharine taste, and used to sweeten the water to excess. I did not take it as a medicine, nor confine myself to any specific quantity; but always used it, when my
appetite

appetite or inclination seemed to require it. However, I at length used it in a considerable quantity; some days to the amount, I believe, of eight ounces; and that, with the small portion of toasted bread put into my drink, was the principal part of my sustenance during the greater part of twelve years; nor did it cease to be so until my stomach became strong, and capable of bearing animal food."

He continued in good health from the preceding period until the month of April, 1793; when, in consequence of a neglected cold, he had a return of all his former dangerous symptoms; but, by recurring to his old regimen, he was again restored to health, in about six months time, excepting in strength; which he recovered by degrees. He is now in better health than he ever was before in his life.

FONTANUS, VALERIOLA, and FORRESTUS, assert that they had patients cured of consumptions of the lungs by a continued use of the *conserve of roses*; and REVERIUS knew an apothecary who cured himself of a confirmed consumption by almost living on the conserve of roses. AVICENNA records an instance of a surprising cure performed on a patient, so nearly dying in a consumption, that prepa-

rations were making for her funeral; and who was not only perfectly restored to health, but became very fat, by eating a great quantity of conserve of roses*. Foreign journals are full of histories of consumptions cured by this medicine.

There are instances where people have scarcely taken any other nutriment than conserve of roses. Some have eaten a pound, and a pound and an half, of this conserve every day: *three fourths of this conserve are sugar.*

The virtues of sugar are not confined to its nutritive and balsamic qualities. It resists putrefaction, and preserves all substances,—flesh, fruits, and vegetables,—from corruption.

It has a great solvent power; and helps the solution of fat, oily, and incongruous foods and mixtures. It promotes their maceration and digestion in the stomach; and qualifies

* This curious case deserves to be remembered. “*Si non timerem dici mendax, narrarem in hac intentione mirabilia, & referrem summam, qua usa est mulier phthifica. Peruenit res cujus ad hoc, ut ægritudo cum ea prolongaretur adeo, donec pervenerit ad mortem, & vocaretur ad ipsam, qui præpararet ea, quæ mortui sunt necessaria. Tunc quidam frater ejus surrexit ad eam, curavit eam, hac cura tempore longo, & revixit & sanata est, & impinguata est; & non est mihi possibile, ut dicam summam ejus, quod comedit de Zuccaro Rosaceo.*” Lib. 3. fen. 10. tr. 5. c. 6. p. 668.

the effects of digestion, to the powers of the lacteals *.

For this reason, sugar is much used in foreign cookery, and so much introduced at the tables of the luxurious in France, and also in Italy, Portugal, Spain,—and indeed in every country, excepting England, in confections, preserves, sweetmeats, and liqueurs †.

Sugar, in the form of syrup, is an admirable vehicle, to comminute and convey to the internal absorbing vessels any alterative, mineral, or vegetable medicine.

By its miscible property, it diffuses minutely any preparation it may hold in solution, or

* “*Nous pensons qu'il donne aux alimens une saveur qui dispose l'estomac à une coction plus parfaite, qui augmentant la force du levain stomacal, excite une fermentation plus complete des alimens dans l'estomac & dans les intestines, & qu'il contribue par conséquent à entretenir dans le cbyle, dans le sang, & toutes les humeurs, les qualités nécessaires pour accomplir & maintenir les fonctions. Ce qui depend toujours de la premiere digestion, dont le dérangement est le principe de tous ceux qui arrivent dans le corps humain.*” POUPE DESPORTES, vol. III. p. 375.

“*Acria lenit, acida obtundit, salsa mitiora austera suaviora reddit, fatuis & insipidis gratum saporem tribuit; atque ut uno verbi concludam, omnium saporum domitor videri potest; nihilque absque saccharo ferè ventrè gratum, panificio operi additur, vinis miscetur, aqua enim saccharo suavior, salubriorque redditur.*” NONNII, de Re Cibaria, lib. I. c. 47. p. 152.

† “*Si perquam, parce ultima mensa devoretur. concoctionem juvat, satietatem ferè tollit.*” ALEX. PETRONIUS, De Victu Romanorum, p. 328.

union, on the surface of the stomach and intestines; and subjects it to the capacity of the orifices of the smallest vessels.

Sugar alone has many medicinal virtues; and, made into a common syrup with water, and disguised, and perhaps somewhat improved by vegetable additions, has performed many cures in diseases, from impoverished blood, rickets, and scrophula, that have baffled the most skilful physicians; and empiricks have accordingly availed themselves of what they term ptisans, and medicated syrups.

The balsamic and fattening properties of sugar are prominently visible in all parts of the world where it is made; and not confined to the human race.

The celebrated historian Mr. BRYAN EDWARDS was too accurate in his researches, to suffer a fact, so interesting as this, to escape his observation.

In his History of the West Indies, he has drawn a faithful representation of a plantation, in the season of making sugar*.

He says, — “so palatable, salutary, and nourishing is the juice of the cane, that every individual of the animal creation, drinking

* January, February, March, and April.

freely of it, derives health and vigour from its use. The meagre and sickly among the negroes exhibit a surprising alteration in a few weeks, after the mill is set in action. The labouring horses, oxen, and mules, though almost constantly at work during this season, yet being indulged with plenty of the green tops of this noble plant, and some of the scummings from the boiling house, improve more than at any other period of the year*.”

It must be observed, that muscovado, or what is called moist sugar, is laxative; and that, in using the juice of the cane, either as a luxury or a medicine, this also is of a laxative nature, particularly with people unaccustomed to it; and sometimes it operates as an active purgative, and disorders the bowels. This happens frequently to Europeans, who arrive in the sugar countries just at crop-time, and, allured by its grateful novelty, take it to excess.

It has been already remarked, that when vegetable sugar was first known, it was used only in medicine; that it was then preferred to honey, and in process of time almost entirely supplanted honey; the sweet, which had

* Vol. II. p. 221, 2d edit.

been in use among mankind, coeval with natural history.

The superiority of sugar would soon be discovered by observing physicians, as being exempt from the uncertain, and sometimes dangerous effects of honey.

There are many people whom a tea-spoonful of honey will disorder. In some habits, even that quantity will cause violent pains in the stomach and bowels; and will act as an emetic, or cathartic, or as both. In others, honey will cause erysipelas, nettle rash, itching, and a general swelling in the body and limbs, and occasion such deleterious effects, as are produced by some vegetable *fungi*; some kinds of fishes, muscles, and poisonous plants.

Medical men who have travelled, or read, or have had much experience, know what extraordinary effects result from these causes.

A melancholy instance among many I have seen, of the mischievous effects of muscles, lately occurred, in the neighbourhood of Chelsea Hospital; where a boy of seven years old was destroyed by eating them; and his father escaped the same fate, with great difficulty, after vomiting of blood, and convulsions.

The

The cause of what is considered as the poison of muscles is generally supposed to arise from some malignant quality inherent in the fish itself; according to the place where it is found, and particular seasons. Some suppose the poison consists in a kind of *stella marina*, a sea insect, frequently found in muscles; whose spawn is very corrosive, and when applied to the skin excoriates it.

But the real cause is, in the indigestible property of a part of the muscle, which should never be eaten; and without which, muscles are innocent and nutritive.

The noxious part of muscles is the hard threads, or wiry filaments, by which they fasten themselves to one another; to the bottom of ships; and to rocks, and stones; and, as if anchored by the strongest cable, no waves nor current can break their hold.

These filaments issue from an hard cartilaginous substance, at the root of what is commonly called the tongue of the muscle, in the middle of its body.

That honey should sometimes produce the ill effects I have mentioned cannot create surprize; if we reflect that the bee distils from every flower, in the great unweeded garden of Nature;

Nature; and that the quality of his manufacture depends on the quality of his materials.

Hence it is that honey in different countries differs so much in flavour, and consequently in wholesomeness.

The honey of some countries is poisonous to every one who makes use of it. POMPEY lost three regiments in *Pontus*, poisoned by honey*; and PLINY says, there is a district in that country, which yields honey that makes people mad who eat it.

But the peculiar antipathy to honey, the occasion of these remarks, may be excited by the essential property of some particular vegetable in that multifarious compound; or, most probably, by the nature of the compound itself.

Incredible as the fact may appear, I know a person who cannot touch honey with her finger, without immediate nervous affections, and cold sweats; and, what is still more extraordinary, the handling, and smelling bee's wax, is accompanied with sensations of the same tendency. Her son, a strong, healthy young man, labours under nearly a similar disposition.

* *Qui mel, in Heraclea Ponti nascens, ederunt, aut biberunt, iis eadem accidunt quæ ab aconito sumpto ingruunt.* P. ÆGINET. lib. V. c. 57.

I have long thought that many children are lost, from inattention; or, more properly speaking, from not knowing the peculiarities, by which temperaments wonderfully differ.

The physical antipathies of children are never looked for; and never discovered.

How many infants linger in a painful manner, and perish by convulsions, where no cause is known, or suspected!

Sudden illness not to be defined,—and sudden death, without any previous indisposition, or traceable vestiges on dissection after death,—are subjects on which little has been said, and nothing done.

Aversion from things obnoxious to physical organization, and repugnance to receive whatever disturbs the functions connected by sympathy, are observable in all animals.

But this spontaneous resistance of nature is always overpowered in children; and is confounded with that indiscriminate desire or disgust, which perhaps would often fatally misguide them.

In advanced age, antipathies demonstrate themselves; and frequently in the most irresistible, and distressing manner.

Rhubarb, among several articles which might be mentioned, violently disorders some people, of all characters of habit, and periods of life. And yet this drug is forced down the throat of every infant, the moment it comes into the world.

Oil acts as a poison to some people; but, as it does not poison every body, it is administered to infants, without suspicion.

Even manna sometimes acts as a poison.

My motives here, are not to enumerate the dangerous consequences, and solitary instances of singular antipathy: otherwise, charges might be brought against every article, constituting our daily food.

BACON says, “all life hath a sympathy with *salt**.” This is true; and the same may be said of sugar. I have one instance of antipathy on record, however, against *salt*†; I know of none against sugar. But doubtless there are instances, where individuals dislike sugar: but I never knew an instance of sugar disagreeing with any person.

This subject leads to an extensive field, which has scarcely been entered, except by

* Hist. Nat. cent 10. art. 982.

† BARTHOLOM. à MARANTA. *Method. Cogn. Simpl. Med. lib. 3. cap. 13.*

those who have had no desire to apply the culture of it to good and rational purposes.

I should proceed further; but I have said enough: as my object here is chiefly to recommend attention to such as have the care of the diet, and regimen of children; that they may keep a jealous eye on the operations of any article of food, or medicine, which has been known to produce injurious effects in habits, under the influence of Idiocracy.

Aged people, who have no teeth, and whose digestive faculties are impaired, and as incapable as those of infants, may like infants live on sugar.

I could produce many instances where aged people have been supported many years, by scarcely any thing but sugar.

Taken in tea, milk, and beer, it has been found not only sufficient to sustain nature, but has caused lean people to grow fat, and has increased the vigour of their bodies. The late king of Sardinia ate a great quantity of sugar daily. He ate it by itself; without dissolving it, or mixing it with any thing. It was his
chief

chief food. After his death, his body was opened, and all his viscera were perfectly found.

The great duke of *Beaufort*, as he was called, who died about an hundred years ago at the age of seventy, was opened; his viscera were found in the same manner; as perfect as in a person of twenty: with his teeth white, and firm. He had for forty years before his death used a pound of sugar daily, in his wine, chocolate, and sweet-meats.

SLARE says, "his grandfather Mr. *Malory* was strong and chearful in his eighty-second year; at which time his hair changed somewhat dark; his old teeth came out, pushed away by young ones; which continued so to do until he had a new set of teeth complete. He lived easy, and free from pain, or sickness, until his hundredth year, when he died. He used sugar to a great degree in all his food, vegetable, and animal; and delighted in all manner of sweet-meats."

He says, "he followed the practice of his grandfather; and used sugar in every thing he ate and drank: and in the sixty-seventh year of his age all his teeth were found, and firm, and in their full number."

I know

I know a person at this time, about eighty years old, who has lived for several years almost on sugar; and is as healthy and strong, and as youthful in appearance, as most people at fifty.

The cause of this fondness for sugar, was a paralytic affection, with which she was attacked nearly twenty years ago, which prevented her, for a considerable time, swallowing any thing but fluids, in which a portion of sugar was dissolved.

Her diet now consists of sugar, and the simple vehicles in which it is taken; these are tea, milk, gruel, barley water, roasted and boiled apples; and beer, generally for supper.

Animal food is not necessary for the pleasurable existence, and bodily health of man*; for mental pleasure and health, perhaps, quite the contrary.

Yet the streets of London seem to oppose these facts, with proofs shocking to reflecting minds. Blood flows in almost every gutter. In the very central, and most frequented places in the town,—what an horrid picture do the

* *Prodiga divitias alimentoque mitia tellus*

Suggerit; atque epulas sine cæde et sanguine præbet.

OVID *Met. L. XV. v. 81, 82.*

slaughter-houses present!—The sight of expiring and agonised animals, tumbled in heaps, while other poor trembling victims are gazing on, indicating by their appearance, their sensibility and sufferings, and the knowledge of their approaching fate.

This practice in the public streets, and markets, is not less disgraceful to humanity, than to decency; and ought to be suppressed. The people's eyes are defiled with savage impressions; and their ideas rendered impure and brutal.—Their hearts, hardened by such cruel scenes, are incapable of moral or social virtue.—“ Damned custom” has

“ _____ braz'd them so,
“ That they are proof and bulwark against sense*.”

In the time of PYTHAGORAS †, sugar was unknown; even to this great traveller. Otherwise his philosophy would have had more converts. His diet was impracticable in most countries, from bulk, carriage, and season. There is more nourishment in a pound of sugar, than in a load of pulse, or vegetables.

* *Hamlet.*

† 500 years before the Christian æra.

If the pure, the divine PYTHAGORAS, undergoing the changes he suggested *, be now in this our planet, and conscious of his former being, how must his holy spirit be depressed at the disappointment of the flattering hope he once had formed; that mankind would rise on his foundation, to the heights of truth; by living according to the simplicity of nature, and the dictates of reason; that their brutal hunt after the lives of God's creatures, and making a science of butchery, would stop; and that the earth would cease to represent a grazing ground, for slaughter; and its bloody inhabitants a mass of canibals!

Two centuries have not elapsed, since it can be properly said, that sugar has become an ingredient in the popular diet of Europe.

There is now scarcely any person who does not mix, more or less of it, in his daily food; excepting the poor, remote inhabitants of the interior, and northern parts of Europe; whose cold, watery diet, most requires it.

* *Spiritus, eque feris humana in corpora transit,
Inque feras nosfer; nec tempore deperit ullo.*

OVID. *Met.* l. XV. v. 167, 168.

The increased consumption of sugar, and the increasing demand for it, exceed all comparison with any other article, used as an auxiliary, in food : for, such is the influence of sugar, that once touching the nerves of taste, no person was ever known to have the power of relinquishing the desire for it.

When sugar was first introduced into England, it is difficult to ascertain ; CHAUCER, in his *Troilus and Cressida*, written in 1380, mentions, allegorically, the sweetness of sugar* ; and, though it was in use in 1466, yet, until it was brought from the Brazils, about 1580, to Portugal, and imported from thence, it was chiefly confined to feasts, and to medicine.

The quantity consumed in England has always kept increasing ; though the whole consumption for nearly a century, subsequent to this period, was inconsiderable.

The importation of sugar into England in 1700 amounted to 481,425 hundred weight ; or 48,142 hogsheds, at ten hundred weight each. The price then was thirty-two shillings the hundred weight.

* " So let your daungir *sugrid* ben alite." Lib. II. l. 384.

The importation into England and Scotland on an average, for 1787, 1788, 1789, and 1790, amounted annually to 1,952,262 hundred weight.

The annual exportation during this period was, on an average, 296,996 hundred weight; which leaves the annual consumption in England and Scotland 1,655,266 hundred weight; or 118,233 hogsheads, of fourteen hundred weight each*.

Thus we find 185,389,792 pounds of sugar are annually consumed in England and Scotland.

But the proportion consumed in Scotland is small; not exceeding 12,000 hogsheads, or 18,816,448 pounds. The consumption then in England only, is 166,573,344 pounds.

Now taking the population of England at 8,000,000, the proportion of sugar to each individual, if each individual had his share, would be about twenty pounds per annum.

These calculations are made, reducing the whole to *raw*, or *muscovado* sugar.

The consumption in Ireland is not in this calculation. Ireland consumes 20,000 hogsheads per annum,

* From 1772 to 1775 the average consumption was 114,613½ hogsheads *per annum*.

Sugar is not an article of smuggling; and there were no prize-sugars at the above period.

Before the Furies lighted their torches in *St. Domingue*, that beautiful island yielded, for the benefit of mankind, 200,000 hogsheds of sugar.

The importation then, into all Europe, from every part of the world, was about 500,000 hogsheds.

The East Indies have not given us a quantity exceeding 5,000 hogsheds per annum. The East Indies cannot, I believe, spare much more for the English market, without further expensive arrangements.

If Jamaica, and the other English sugar islands, were to share the fate of *St. Domingue*, by the horrors of war, a distress would arise, not only in England, but in Europe, not confined to the present generation, but that would descend to the child unborn.—Of such importance has the agriculture of half a million of Africans*, become to Europeans.

* The negroes employed in the West Indies, in cultivating the cane, and manufacturing sugar, do not much exceed this number. Altogether there are, in the English colonies about 461,684 blacks; and in the French colonies about 489,265. In Jamaica, in the year 1698, there were 40,000 blacks, and 7,365 whites. In 1741, 100,000 blacks, and 10,000 whites. In 1787, 255,780 blacks, and 23,000 whites. The population in that island, at this time, is about the same.

The loss of sugar cannot be estimated, by a survey of the diet of Europe, before sugar was known. If it were possible that people could retrograde into the habits of that time, they would want some of the means then in use for their support.

From the loss of sugar, many articles and vegetable mixtures, which now constitute the most agreeable and most wholesome parts of the food, particularly of youth and delicate people, would be useless; and for which we have no salutary substitute.

There are some saccharite enthusiasts who attribute to the use of sugar the extinction of the plague in Europe;—that is not the case:—but it has certainly contributed to suppress the native malady of England—the *Scurvy*.

That state of the habit which we denominate scurvy, perhaps the parent of scrophula and consumption, disposes the system to the ravages of fevers; and hence the great mortality in former times; when pestilential fevers and plagues invaded the English, deeply infected by the scurvy.

An article in constant use, to the extent sugar now is, must have considerable influence in disposing the body to receive or resist disease. Because the blood, and the growth, or

changes, and support of the frame, depend on the aliment received into the stomach; and the general state of the system, exclusive of climate and particular organization, must be affected accordingly.

The formation of the body, and more of the inclination of the mind than is generally imagined, depend on the nature and quality of our food. This I had occasion formerly to remark*.

Without resorting to the metamorphosis of *Nebuchadnezzar*, MONTESQUIEU was so persuaded of this doctrine, that he asserts in many animals, excepting their mere bones, their mental as well as their corporal character, is decided by it.

This is indeed so strongly distinguishable among the lower classes, in some countries, that one would almost conclude, a man is but a walking vegetable—or an hieroglyphic—importing the food, of which he is compounded.

The savageness of the wildest animals is softened by diet; and it sometimes appears as if ferocity would sleep quietly in the frame, unless awakened by sensations excited by the colour, scent, and taste of blood.

* Treatise on COFFEE, Ed. 5. page 1.

I knew a person at Kingston, in Jamaica, a Mr. *Benjamin Parker*, who had nearly lost his life, by an event which illustrates this supposition.

He had a Spanish-main tyger, which he brought up on milk and sugar, and bread,—from the time it was newly born, until it was nearly full grown. It slept in his room, frequently on his bed, and went about the house like a spaniel. He was taken ill of a fever. I directed him to be bled. Soon after the operation he fell asleep, with the tyger by his side, on the bed. During his sleeping, the arm bled considerably. The tyger, which as yet had never seen blood, or tasted animal food, while Mr. *Parker* was sleeping, had gnawed his shirt sleeve, and the bloody part of the sheet into a thousand pieces. He had also detached the compress, and got at the bleeding orifice of the vein, and licked up the blood running from it. The impatient animal, forgetting in a moment his domestic education, and the kindness of his master, began to use the arm with some roughness with his teeth, which awaked Mr. *Parker*. On his rising up in his bed, the tyger and master were in mutual consternation. The tyger gave a spring, and jumped on an high chest of drawers in the

room ; from that, to the chairs, and tables, and ran about the house in wild and horrible phrenzy. I arrived at the house at the time of this confusion. The tyger escaped into the garden :—where he was shot.

Europe is in a much better state of bodily health than it was formerly. It has also undergone great changes in its mental condition ; as all Europe feels. There is still some room for improvement in both. But the latter is a devious road from my object, which I must leave to divines and politicians ; and confine myself to a path, with which I hope I am better acquainted—WARWICK LANE.

There are no distempers now in Europe maiming and rotting whole countries ;—and, I conceive, what our ancestors reprobated, and dreaded the importation of so much, under the appellation of luxuries, has had a considerable share in this alteration.

Since European countries have had intercourse with the East and West Indies, and a free and enlarged traffic with each other, and commerce has supplied the deficiencies of one country, from the superfluities of another, Europe has greatly improved in its regimen.

The popular diet before was crude, coarse, and unwholesome. A royal English dinner of
the

the twelfth century would be despised by a modern tradesman. Spices, wine, sugar, and culinary chemistry, made no part of the repast.

But people have not used these bounties of nature, and art, with prudence. If they have now no dread of some of the heavy calamities which then made their ravaging visitations, there are too many who have by their excesses acquired others, which embitter the chronical hours of declining life.

This reflexion does not extend to labouring people; they are strangers to more of foreign productions than what barely qualify their food for health; and though short-lived, they are providentially secured against the miseries of ill-used opulence,—the derangements of gluttony and repletion: the principal diseases in England.—Old CORNARO's bodily doctrines for health and longevity*, are as repugnant to the English, as LUTHER's spiritual doctrines were to him.

Diseases in general would be uniform, and never undergo much alteration, were people

* *Tale si partisse da tavola, che potesse ancora mangiare, & bere.*
Discorsi della Vita Sobria. Anno 1620.

to feed only on the produce of their own soil. This appears in the diseases of cattle; and also in those of Indians; and people living in a state of nature, without foreign communication: and this likewise appears, in a great degree, among artificers and manufacturers, and such as cannot deviate in habit.

In commercial countries, where articles of foreign growth, and dissimilar climates enter into dietetic use, with the generality of a people, it is impossible that the type of their diseases should remain stationary; or that some will not appear, and others disappear, from any considerable change, or subversion of custom.

Within my memory the inflammatory tendency of diseases in Europe, has gradually diminished. There are not so many pleuresies among the reapers in harvest, as there were formerly.

Every physician knows, that the practice employed in fevers in the last century is now obsolete; and that the practice of the preceding century is still more so. I speak also of diseases in general. Accurate physicians know, that fevers are continually disappointing them.

The

The science of medicine therefore has not improved,—it has changed: because diseases change. It is to be remembered, that HIPPOCRATES, CELSUS, and GALEN, knew all that was possible to be known in their time; yet we cannot go by their writings; and, if they had left us nothing but their prescriptions, we should not now be much benefited in our practice, by their labours.

I shall now conclude this treatise; not without hopes that the difficulties I mentioned, in the way of a correct history of SUGAR, have sufficiently appeared, to justify my motives in premising them: and to extenuate many defects in the execution of this undertaking.

The political government, civil administration of public and private affairs, and the commercial interests of the sugar colonial settlements, have been well delineated by historians of different nations.

In England, we have the father of correct English-West-Indian literature, Mr. EDWARD LONG; and, since his invaluable publication, we have the learned, and comprehensive view of those countries by Mr. BRYAN EDWARDS.

These

These enlightened historians have left scarcely any information unfolded, respecting the West-Indian islands, from the time they were first known to Europeans, down to their own days.

Much also of curious matter has been given by other ingenious men, concerning branches of the natural history of the West-Indies; but the anatomy in general, in this department, is without their method and science.

Great beauties, and sublime objects, are still untouched by Europeans; and the SUGAR CANE, the heart of the solar world, has never been dissected.

By the Planter, the SUGAR CANE has been no further considered, than as it relates to the engine, and the copper.

In the precious fluid of its cells, he has found that, which philosophers have so long searched for in vain.

Wrapt in the rich fancy of its all-powerful influence, his chief concern is in its transmutation:—but he gives the world the blessings of his alchemy.

In the season of this great—this fascinating work,—a sugar-plantation represents the days of Saturn.—Every animal seems to be a member of the golden age.

At

At home, the merchant, from this transatlantic operation, supports legions of manufacturers. With pointed finger on the globe, he follows the car of phœbus with anxious care, through the heavenly signs propitious to his views; collects his rays from equatorial climes; diffuses their genial warmth over the frigid regions of the earth, and makes the industrious world one great family.



AN ACCOUNT of the QUANTITY of BRITISH PLANTATION SUGAR ANNUALLY IMPORTED INTO GREAT BRITAIN; with the amount of duties paid thereon, from the year 1764 to 1791, both inclusive. Also, an ACCOUNT of the QUANTITY of RAW and REFINED SUGARS EXPORTED FROM GREAT BRITAIN in the above periods; with the amount of Drawbacks and Bounties paid thereon, distinguishing each year, and the Raw from the Refined; distinguishing also the quantities exported to Ireland.

Yrs.	British Plantation Sugar imported.			British Plantation Sugar exported.			B.iffth Plantation Sugar exported.			Refined Sugar exported.			Bounties.			
	Cwt.	q. lb.	Duty.	To Ireland.	To other Parts.	Total.	Drawbacks.	To Ireland.	To all other Parts.	Total.	To Ireland.	To all other Parts.	Total.	L.	s.	d.
1764	1,488,079	- 11	467,814 17 4	119,670 1 13	77,908 3 12	197,579 - 25	62,734 8 2	3,630 - 2	172,672 3 21	176,302 3 23	127,819 11 10					
5	1,227,159	3 18	385,788 7 -	136,004 3 8	13,120 1 2	149,125 1 5	47,160 17 3	9,771 1 12	105,074 - 16	114,851 2 -	83,269 6 9					
6	1,522,732	2 10	478,709 1 -	125,558 1 26	3,678 - 6	129,236 2 4	40,971 - 6	5,378 - 14	22,223 3 24	27,602 - 10	20,011 10 3					
7	1,538,834	1 8	480,895 19 9	180,156 2 20	29,376 3 5	209,533 1 25	66,264 19 -	5,584 - 13	30,384 - 27	35,968 1 12	26,077 1 2					
8	1,551,512	1 14	519,194 5 6	183,049 3 5	44,144 - 16	227,193 3 21	71,850 1 8	6,552 - 6	32,721 2 21	39,273 2 27	23,473 8 5					
9	1,525,070	- 5	479,443 17 -	195,382 3 5	21,001 - 23	216,384 -	68,431 8 9	7,414 1 15	26,627 1 13	34,041 2 16	24,680 3 3					
1770	1,818,229	1 23	571,605 17 5	127,181 2 -	72,766 3 9	199,938 1 9	63,167 4 9	3,802 3 6	39,806 1 13	43,609 1 19	31,616 16 8					
1	1,492,096	2 24	469,077 17 10	192,120 2 17	3,738 2 12	195,859 1 1	61,940 9 10	8,842 3 20	46,367 - 2	55,210 - 12	40,027 6 9					
2	1,829,721	- 8	575,218 10 4	172,269 2 5	11,596 - 3	183,865 2 8	58,128 6 7	10,167 3 2	21,813 - 17	31,080 3 19	23,186 3 3					
3	1,804,080	2 26	565,157 17 6	184,252 2 17	4,937 - 22	189,189 3 11	59,831 5 8	9,784 - 27	19,050 3 15	28,835 - 1	20,905 9 3					
4	2,029,715	1 25	638,104 18 8	211,304 1 25	13,637 2 10	224,942 - 7	71,137 18 3	7,899 2 14	24,613 3 9	32,513 1 22	23,572 5 2					
5	2,021,059	3 23	635,370 14 1	125,684 3 12	8,296 3 17	344,648 1 1	108,995 - 2	9,972 3 3	59,767 1 18	69,740 - 6	50,561 19 9					
6	1,726,507	1 10	542,770 15 -	201,757 - 7	113,696 1 8	315,453 1 15	99,763 14 11	12,941 2 3	55,907 2 9	68,849 - 12	49,915 12 -					
7	1,416,291	1 5	445,246 11 4	150,241 3 -	11,572 3 26	161,814 2 26	51,173 18 2	15,530 2 21	55,522 2 21	71,053 1 14	51,513 13 11					
8	1,521,457	1 24	478,304 13 7	130,865 1 26	11,897 2 19	142,763 - 17	45,148 16 10	7,013 1 8	48,908 - 17	55,921 1 25	40,543 1 4					
9	1,525,833	- -	506,671 18 5	92,793 1 25	6,223 2 16	99,017 - 13	32,870 10 6	7,411 1 3	18,716 1 18	26,127 2 21	18,942 11 5					
1780	1,394,559	1 22	463,080 19 -	116,700 - 19	1,853 2 6	118,553 2 25	39,391 18 -	16,254 2 7	22,068 1 18	38,322 3 25	27,784 3 1					
1	1,080,848	2 9	633,647 2 -	142,493 1 24	27,067 1 3	169,560 2 27	99,228 7 3	12,033 2 17	51,508 1 12	63,542 - 1	46,067 19 1					
2	1,374,269	3 24	844,030 15 10	83,646 - 11	7,615 1 21	91,261 2 4	56,049 15 8	7,643 - 22	24,824 1 12	32,467 2 6	42,207 16 4					
3	1,584,275	- 18	973,909 - -	154,756 1 6	18,382 - 15	173,138 1 21	106,333 17 11	10,977 - 24	93,798 - 9	104,775 1 5	136,207 17 7					
4	1,782,386	- 3	1,094,682 1 7	133,149 1 19	7,330 1 13	140,479 3 4	86,345 3 4	5,288 - 27	126,321 - 27	131,609 1 20	171,092 6 6					
5	2,075,909	3 24	1,274,954 14 2	199,218 2 24	3,735 1 9	202,954 - 5	125,154 19 9	6,894 1 5	129,099 1 21	133,993 2 26	175,791 17 -					
6	1,613,965	1 14	993,301 - -	98,266 - 5	3,767 2 4	102,033 2 7	62,665 11 2	8,700 3 17	73,049 3 12	81,750 3 1	106,275 19 8					
7	1,926,621	- 26	1,188,083 1 10	196,636 3 20	2,779 1 16	199,416 1 8	122,973 7 11	14,320 1 4	62,415 - 15	76,735 1 19	99,756 - 10					
8	2,065,817	1 23	1,273,920 15 -	138,681 3 19	6,391 2 10	145,073 2 1	89,461 19 10	8,001 2 22	77,399 2 21	85,401 1 15	111,021 15 11					
9	1,936,440	- 2	1,194,915 2 6	148,245 3 -	5,561 2 15	153,813 1 15	99,808 19 11	10,702 1 11	127,837 2 -	138,539 3 11	180,101 16 -					
1790	1,882,106	- 4	1,160,645 12 4	139,193 3 24	2,991 1 7	142,185 1 3	87,680 18 4	8,484 - -	111,332 2 10	119,817 - 4	155,762 2 11					

The value of the whole of the British West Indian products imported, for the following years, according to the Custom-House prices.

Years.	Value.	Years.	Value.
	£.		£.
1764	2,391,552	1778	3,059,922
1765	2,196,549	1779	2,836,489
1766	2,704,114	1780	2,612,236
1767	2,690,673	1781	2,023,546
1768	2,942,717	1782	2,612,910
1769	2,686,714	1783	2,820,387
1770	2,110,026*	1784	3,531,705
1771	2,979,378†	1785	4,400,956
1772	3,530,082	1786	3,484,025
1773	2,902,407	1787	3,758,087
1774	3,574,702	1788	4,307,866
1775	3,688,795	1789	3,917,301
1776	3,340,949	1790	3,854,204
1777	2,840,802		

* The value of the produce of *St. Domingue*, according to an account published in France this year, amounted to £.2,923,333; viz. Sugar £.2,400,000; Coffee £.83,333; Cotton £.120,000; Indigo £.300,000; Tanned Leather £.20,000.

† The accounts preceding, refer to England only. Those for the year 1771, and all subsequent, are for England and Scotland.

N.B. The total of ships cleared outwards from England and Scotland, from December 1786 to December 1787, was 528, amounting to 123,581 tons; and the total of those entered inwards was 576, amounting to 132,222 tons. The value of goods, British produce, and manufactures, exported from Great Britain to the West Indian colonies in 1787, was £.1,463,879. 14s. 11d.

An

An account of the products entered for exportation from St. Domingo to France, for the following years.

Years.	Sugar Clayed. lb.	Ditto Muscovado. lb.	Coffee. lb.	Cotton. lb.	Indigo. lb.
1783	77,339,113	44,312,919	44,573,479	4,871,718	1,868,728
1784	65,053,050	77,344,464	52,885,095	4,756,857	1,555,142
1785	66,589,357	83,610,521	51,368,109	4,486,261	1,546,575
1786	71,063,697	61,887,814	52,180,311	5,203,161	1,103,907
1787	56,182,403	72,896,676	70,003,161	6,806,174	1,166,177
1788	70,227,709	93,177,512	68,151,181	6,286,126	930,016
1789	47,516,531	91,899,963	76,286,530	6,871,204	958,626

N. B. The above are heavier than English weights by 8 per cent.

St. *Domingue* was generally considered in France to yield about two-thirds of all their West Indian produce; and, in 1788, this island alone loaded for France 580 ships, of 370 $\frac{1}{4}$ tons on a medium, and 110 of 740 tons: exclusive of the numerous French and foreign vessels employed in the trade with North and South America, amounting, in the whole, to 296,435 tons, nearly equal to one-third of the private ships of Great Britain.

MISCELLANEOUS
MEDICAL
OBSERVATIONS.

MIRCHALLANOUS

MEDICAL

ORSERVATIONS

MEDICAL OBSERVATIONS.

C O W - P O X.

THE *Cow-Pox* has lately appeared in England. This is a new star in the *Æsculapian* system. It was first observed from the Provinces. It is so luminous there, that the greasy-heeled hind feet of Pegasus are visible to the naked eye; the hidden parts of that constellation, which have puzzled astronomers, as to the sex of Pegasus; and which HIPPARCHUS, TYCHO, HEVELIUS, FLAMSTEAD, and HERSCHEL, could never discover. The reason now is evident.

The medical Pythonissas are divided in their opinion respecting this phenomenon.

Great events are foreboded.—Some pretend that a restive greasy-heeled horse will kick down all the old gally-pots of GALEN.—Others, that the people of England are becoming like the inhabitants of a wilderness, beyond the

land of Cathay, seen in 1333, by the rare and inimitable Sir JOHN MANDEVILE,—who, he says, were “wild, with horns on their heads, very hideous and speak not; but rout as swine*.”

To preserve, as far as in me lies, the genesis of this desirable—this excelling distemper, to posterity,—I mention, that it is said to originate in what is called, the *greasy heel* distemper, in horses. These *greasy heels*, are said to infect the hands of people who dress and clean them. The hands of people thus infected, are said to infect the teats of cows in milking them. The teats of these infected cows in return, are said to infect the hands of others who milk them; and so the distemper, is said to be propagated among the country people.

The virtues of this charming distemper, are said to be an amulet against the small-pox; that it is mild and innocent; and communicated with safety by inoculation.

Wonderful things do certainly appear in all ages; the great ERASMUS mentions a man, one *Philario*, an Italian, who in Holland was very much afflicted with worms. While the worms

* Quarto ed. 1677. chap. 87.

were in his body, he spoke the Dutch language fluently. When his physician cured him of the disorder, he could not speak a word of that language. The Dutch worms and the Dutch language left *Philario* together*!

In this *Cowmania*, it is not enough for reason to concede, that the Cow-pox may lessen, *for a time*, the disposition in the habit to receive the infection of the *Small-pox*.

All cutaneous determinations; catarrhal fevers; and every disease of the lymphatics; and medicine, tending, to what SYDENHAM would call depurating that system, do the same.

Surgeons know, that the first inflammation of any membrane is the most violent: and that reiterated inflammation deadens sensibility.

But no complaint to which people are repeatedly subject, as the Cow-pox, can perform all circumstances in the habit, equivalent to the Small-pox, which people never have but once.

Besides, the Small-pox does not destroy the disposition in the habit to receive the Cow-pox.

* *Crede quod habes, et habes*—ERASME!

If that be the case, the Small-pox and the Cow-pox, then, are not analogous ; but radically dissimilar.

The Small-pox is undoubtedly an evil ; but we understand the extent of that ill ; which we had better bear,

“ than fly to others that we know not of.”

Inoculation has disarmed the Small-pox of its terrors ; and reduced it to management*.

I have inoculated in the West Indies, and in Europe, several thousands. I never lost a patient. I speak subject to the animadversions of contemporaries. I should not have mentioned this, but that it gives me an opportunity of saying many others, whom I know, have done the same, with the same success. Accidents, in the inoculated Small-pox, are uncommon ; and we all know from experience, that disease, properly treated, leaves nothing after it injurious to the constitution.

The subject, respecting the distempers of the brute creation, of which we know but little, has not been overlooked by the learned and

* In 1721, and the two following years, there were only 447 persons inoculated in Great Britain.

curious ;

curious; nor is history destitute of many instances of their fatal effects to the human race*.

Can any person say what may be the consequences of introducing the *Lues Bovilla*, a *bestial* humour—into the human frame, after a long lapse of years?

Who knows, besides, what ideas may rise, in the course of time, from a *brutal* fever having excited its incongruous impressions on the brain?

Who knows, also, but that the human character may undergo strange mutations from *quadrupedan* sympathy; and that some modern *Pasiphaë* may rival the fables of old?

I mention this serious trifling, not from disrespect to the ingenious, nor to discourage inquiry; the object well deserves it;—but the doctrine of engrafting distempers is not yet comprehended by the wisest men: and I wish to arrest the hurry of public credulity, until

* LUES BOVILLA, *Thierfouchen Gift*,—"Homines interdum sub incauta pecorum ægrotantium medicatione, vel à detractiōne pellis mortuorum, imo etiam coriarios alutam e pellibus demortuorum animalium fabricantes inficit, & febrem putrido-inflammatoriam cum bullis ichorosis, aut papulis nigris, partem cui incidit, valde inflammantibus excitat." PLENCK, *Toxicolog.* p. 60. Ed. Viennæ, 1785.

the subject has undergone a deep, calm, and dispassionate scrutiny; and to guard parents against suffering their children becoming victims to experiment.

What misery may be brought on a family after many years of imaginary security!

THE YAWS.

There are several distempers of *bestial* origin, I have no doubt.

The *Yaws* is one of them; and, not being understood in Europe, and a well-known affliction in the sugar colonies, it is not foreign to my purpose to notice it here.

The *yaws* naturally is an original African distemper. It may be communicated to white people, as it is to blacks, by inoculation, and by accidental contact, when the ulcerous matter is carried into the habit by absorption, as it is called. I have seen several shocking instances of this sort. But it breaks out in negroes without any communication, society, or contact.

The seeds of the *yaws* descend from those who have ever had it, to their latest posterity.

No

No period from infancy to age exempts them from it. Its appearance is uncertain.

CHEVALIER and HILLARY speak of the *yaws*; but their accounts are erroneous. CHEVALIER perhaps never saw it*. HILLARY often saw it; but he misunderstands HALI ABBAS, whom he has quoted; endeavouring to prove it is common in Arabia as well as in Africa †.

TURNER never saw it, and is absurd ‡; and our great SYDENHAM, who was a total stranger to it, scarcely ever committed an error, but in this instance §.

The *yaws* differs altogether from every other disorder, in its origin, progress, and termination.

Left to itself, it sometimes departs in 9, 12, 15, or 18 months, without leaving behind it any inconveniency. Sometimes it remains much longer, and ends in shocking nodes, and distortions of the bones. Many are destroyed by it. No person is subject to it twice.

From want of care and proper management, the torments of the *yaws* surpass all descrip-

* *Maladies de St Domingue.* 1752.

† *Diseases of Barbadoes,* 1759.

‡ *Syphilis.* p. 6. ed. 5.

§ *Opera Universa,* p. 327, ed. *Lugd. Batav.* 1741. N. B. written anno 1679.

tion, from the *bone ache*, and dreadful agonizing curvatures, and caries of the legs, arms, collar-bones, wrists, and almost every other bone, and articulation in the body.

There is also, sometimes, a relic after the original malady is gone, called the *master yaw*; this is an inveterate ulcer, proceeding from the largest *yaw*, or chief determination of the eruption.

Generally, this distemper terminates in what are called *crab yaws*. These are painful sores, or cracks in the feet, sometimes spongy, sometimes hard and callous.

There are two sorts of *yaws*, like the two species of *Farcy* in horses; the *common yaws* and the *running yaws*.

The *common yaws*, without fever or indisposition, begins with small pimples, which soon increase, and appear in round, white, flabby, eruptions, from about the size of a pea to that of a large strawberry, separately, or in clusters, in different parts of the body. These eruptions do not appear all at once; and, when some are declining, and others disappearing, a fresh crop comes out in a different part of the body. Sometimes a few doses of sulphur will force them out, when they are thought to be entirely gone from the habit.

The

The *running yaws* breaks out in spreading cutaneous ulcers, discharging a great quantity of acrid corrosive matter, in different parts of the body. This is the worst sort.

The cure of the *yaws* is now understood by skilful practitioners. Inoculation is performed with success. Care soon removes the principal mischief of the distemper; and the *crab yaws* are easily cured in the manner which I have related in another publication*.

Formerly there was no regular method of treating the *yaws* in the West Indies. It was thought to be a disorder that would have its course, and, if interrupted, that it would be dangerous.

It was then the custom, when a negro was attacked with it, to separate him from the rest, and send him to some lonely place by the sea side, to bathe; or into the mountains, to some Provision Ground, or Plantain Walk; where he could act as a watchman, and maintain himself, without any expence to the estate, until he was well: then he was brought back to the Sugar-Work.

But this rarely happened. A cold, damp, smoky hut, for his habitation; snakes and li-

* *Treatise on Tropical Diseases*, Ed. 3, p. 519.

zards his companions ; crude, viscid food, and bad water, his only support ; and shunned as a leper ;—he usually sunk from the land of the living.

But some of these abandoned exiles lived, in spite of the common law of nature, and survived a general mutation of their muscles, ligaments, and osteology ; became also hideously white in their woolly hair and skin ; with their noses, like the beaks of old eagles—starving the creatures, by obstructing the passage to their mouths,—and their limbs and bodies twisted and turned, by the force of the distemper, into shocking grotesque figures, resembling woody excrescences, or stumps of trees ; or old Ægyptian figures, that seem as if they had been made of the ends of the human, and beginnings of the brutal form ; which figures are, by some antiquaries, taken for gods, and by others, for devils.

In their banishment, their huts often became the receptacles of robbers and fugitive negroes ; and, as they had no power to resist any who chose to take shelter in their hovels, had nothing to lose, and were forsaken by the world, a tyger would hardly molest them. Their desperate guests never did.

The

The host of the hut, as he grew more misshapen, generally became more subtile;—this we observe in England, in crooked scrophulous persons;—as if Nature disliked people's being both cunning, and strong.

Many of their wayward visitors were deeply skilled in magic, and what we call the *black art*, which they brought with them from Africa; and, in return for their accommodation, they usually taught their landlord the mysteries of sigils, spells, and forcery; and *illuminated* him in all the occult science of OBI.

These ugly, loathsome creatures thus became oracles of woods, and unfrequented places; and were resorted to secretly, by the wretched in mind, and by the malicious, for wicked purposes.

OBI, and *gambling*, are the only instances I have been able to discover, among the natives of the negro land in Africa, in which any effort at combining ideas has ever been demonstrated.

O B I.

The science of OBI is very extensive.

This OBI, or, as it is pronounced in the English West Indies, *Obeab*, had its origin, like many customs among the Africans, from the ancient Ægyptians.

אוב \bar{o}_B is a demon, a spirit of divination, and magic.

When Saul wanted to raise up Samuel from the dead, he said to his servants, “ Seek me a woman (בְּעֵלַת אֹב *eminent for* \bar{o}_B) that hath a familiar spirit.”

His servants replied to him,

הִנֵּה אִשָּׁה בְּעֵלַת אֹב בְּעֵין דֹּדֹר

“ *Behold there is a woman mistress in the art of \bar{o}_B , in Hen-dor.*”

When the witch of Hen-dor came to Saul, he said to her,

קְסוּמִי נָא לִי בְּאֹב

“ *Divine, I pray thee, unto me, in thy witchcraft \bar{o}_B , and raise him up from the dead whom I shall name unto thee.*”

She

She accordingly raised up *Samuel*, from whom *Saul* had but an unpleasent reception.

Saul must indeed have been “fore distressed,” to have recourse to, and place his faith in, an art he persecuted, and thought he had exterminated. For, during his reign,

הַכְּרִית אֶת * הָאֲבוֹת וְאֶת † הַיְדְעָנִים מִן הָאָרֶץ

“He cut off magicians, and foretellers of future events from the earth. †”

OBI, for the purposes of bewitching people, or consuming them by lingering illnesses, is made of grave dirt, hair, teeth of sharks, and other animals, blood, feathers, egg-shells, images in wax, the hearts of birds, liver of mice §, and some potent roots, weeds, and bushes, of which Europeans are at this time ignorant; but which were known, for the same purposes, to the ancients.

Certain mixtures of these ingredients are burnt; or buried very deep in the ground; or hung up a chimney; or on the side of an

* *Εγγαστριμυθους*. LXX. *Pythones*, PAGNIN.

† *Γωστας*. LXX. *Sciolum*, PAGNIN.

‡ 1 *Samuel*, c. xxviii. v. 7, 8, and 9.

§ See *Isaiah*, c. lxvi. v. 17. also, PIERIUS on the Ægyptian hieroglyphics.

house ; or in a garden ; or laid under the threshold of the door of the party, to suffer ; with incantation songs, or curses, or ceremonies necromantically performed in planetary hours, or at midnight, regarding the aspects of the moon. The person who wants to do the mischief is also sent to burying-grounds, or some secret place, where spirits are supposed to frequent, to invoke his, or her dead parents, or some dead friend, to assist in the curse.

A negro, who thinks himself bewitched by OBI, will apply to an *Obi-man*, or *Obi-woman*, for cure.

These magicians will interrogate the patient, as to the part of the body most afflicted. This part they will torture with pinching, drawing with gourds, or calabashes, beating, and pressing. When the patient is nearly exhausted with this rough *magnetising*, OBI brings out an old rusty nail, or a piece of bone, or an afs's tooth, or the jaw-bone of a rat, or a fragment of a quart-bottle, from the part ; and the patient is well the next day.

The most wrinkled, and most deformed *Obian* magicians are most venerated. This was the case among the Ægyptians and Chaldeans.

In general, *Obi-men* are more sagacious than *Obi-women*, in giving, or taking away diseases; and in the application of poisons. It is in their department to blind pigs, and poultry; and lame cattle.

In this surprising knowledge, the Africans are far superior to the Indians, though they are also skilled in the venefical art; and are matchless in arming their deadly arrows.

A negro *Obi-man* will administer a baleful dose from poisonous herbs, and calculate its mortal effects to an hour, day, week, month, or year. These masters could instruct even Frier BACON; and frighten THOMAS AQUINAS*.

It is the province of the *Obi-women* to dispose of the passions. They sell foul winds for inconstant mariners †; dreams and phantasies for jealousy; vexation, and pains in the heart, for perfidious love; and for the perturbed, impatient, and wretched, at the tardy acts of time,—to turn in prophetic fury to a future page in the book of Fate,—and amaze the ravished sense of the tempest-tossed querent.

* The mechanical and magical skill of ROGER BACON has no parallel in history. He invented images that could speak. THOMAS AQUINAS was so frightened at an automaton made by ALBERTUS MAGNUS, that he broke it in pieces.

† King *Ericus* of Sweedland had a cap, which by turning, he could make the wind blow from any quarter he pleased. OLAUS MAGNUS *de Gent. Sept.* lib. iii. c. 14.

The victims to this nefarious art, among the negroes in the West Indies, are more numerous than is generally known. No humanity of the master, nor skill in medicine, can relieve a negro, labouring under the influence of OBI. He will surely die; and of a disease that answers no description in nosology. This, when I first went to the colonies, perplexed me.

Laws have been made in the West Indies to punish this *Obian* practice with death; but they have been impotent and nugatory. Laws constructed in the West Indies, can never suppress the effect of ideas, the origin of which is in the centre of Africa.

There was a time, and that not very long ago, when poverty, ugliness, and wrinkles, with palsied head and trembling limbs, constituted suspicions of OBI in England; and for which many old women have been tried, condemned, and hanged, as perpetrators of every untoward accident in their neighbourhood.

But the most bloody tragedy ever acted in the black theatre of superstition, was performed in New England, in North America, in 1692, by the hypochondriacal descendants of the moody melancholy English, who settled in that province.

Sir William Phipps was, at the breaking-out of this phrenzy, governor of the province. This governor was originally a ship-carpenter. He, in conjunction with a few wicked preachers, and magistrates, began such a diabolical scene of murder, under the sanction of legal forms, that went to exterminate every person who differed in opinion from, or was in any respect disagreeable to, this inhuman gang, for witchcraft; the popular mental malady in that country. But the Governor was impeached for mal-administration, and suddenly removed from the province.

This horrid transaction was opened at *Salem*; where nineteen of the most pious and orderly inhabitants were hanged, and one was pressed to death. An hundred more who were in prison waiting for trial, and two hundred under accusation escaped, by the Governor's removal.

The first victim in this horrid affair, was a *Mr. George Burroughs*, minister at *Falmouth*, a neighbouring village; a man of exemplary manners, and unblemished character. After his execution he was dragged on the ground, by the halter with which he had been hanged, and thrown into a pit in a lonely wood, inhabited only by wild beasts:—and, as a further

mark of the brutality of these administrators of public affairs, his face, and one of his hands, were ordered to be left uncovered in the earth : which was accordingly done by the executioner.

Another irreproachable man, a Mr. *John Bradstreet*, to save his life, fled from this jurisdiction. For wretches had been procured to swear, that Mr. *Bradstreet* rode through the air on his dog, to witch meetings. The Governor and his party, losing this intended victim, revenged themselves on the dog ; had him arrested, and put to death, as an accomplice with his master.

This barbarous insanity was called the *Witch Plague*. It was first set on foot by one *Parris*, minister of *Salem*. This fellow had a beautiful Indian maid, named *Tumba*, whom he had by some means or other procured from her native country, to attend upon his niece and daughter. These girls, among many others, being attacked with nervous affections and the endemial despondency of that part of America, were deemed bewitched. In some of their distempered reveries, they fancied they had seen *Tumba's* ghost. Poor *Tumba* was seized ; put into a dungeon in the common prison ; confessed herself a witch to save her
her

her life: but her ruthless master, after beating her into the confession of what he wanted, and of which she was innocent, sold her to slavery to pay the gaoler's fees.

I saw the OBI of the famous negro robber, *Three fingered JACK*, the terror of Jamaica in 1780. The Maroons who slew him brought it to me*.

His OBI consisted of the end of a goat's horn, filled with a compound of grave dirt, ashes, the blood of a black cat, and human fat; all mixed into a kind of paste. A cat's foot, a dried toad, a pig's tail, a slip of virginal parchment of kid's skin, with characters marked in blood on it, were also in his *Obian* bag.

These, with a keen sabre, and two guns, like *Robinson Crusoe*, were all his OBI; with which, and his courage in descending into the plains and plundering to supply his wants, and his skill in retreating into difficult fastnesses, among the mountains, commanding the only access to them, where none dared to follow him, he terrified the inhabitants, and set the civil power, and the neighbouring militia

* He was slain on Saturday 27th of January, 1781.

of that island, at defiance, for nearly two years.

He had neither accomplice, nor associate. There were a few runaway negroes in the woods near Mount Lebanon, the place of his retreat; but he had crossed their foreheads with some of the magic in his horn, and they could not betray him. But he trusted no one. He scorned assistance. He ascended above SPARTACUS. He robbed alone; fought all his battles alone; and always killed his pursuers.

By his magic, he was not only the dread of the negroes, but there were many white people, who believed he was possessed of some supernatural power.

In hot climates females marry very young; and often with great disparity of age. Here JACK was the author of many troubles:—for several matches proved unhappy.

“Give a dog an ill name, and hang him.”

Clamours rose on clamours against the cruel forcerer; and every conjugal mishap was laid at the door of JACK's malific spell of *tying the point*, on the wedding day.

God knows, poor JACK had sins enough of his own to carry, without loading him with the sins of others. He would sooner have made a *Medean* cauldron for the whole island, than

than disturb one lady's happiness. He had many opportunities; and, though he had a mortal hatred to white men, he was never known to hurt a child, or abuse a woman.

But even JACK himself was born to die.

Allured by the rewards offered by Governor DALLING, in proclamations, dated the 12th of December, 1780, and 13th of January, 1781 *; and, by a resolution of the House of
Assem-

* BY THE KING. A PROCLAMATION.

Whereas we have been informed by our House of Assembly of this our Island of Jamaica, that a very desperate gang of Negro Slaves, headed by a Negro Man Slave called and known by the name of *Three-fingered JACK*, hath, for many months past, committed many robberies, and carried off many Negro and other Slaves on the Windward roads into the woods, and hath also committed several murders; and that repeated parties have been fitted out and sent against the said *Three-fingered JACK*, and his said gang, who have returned without being able to apprehend the said Negro, or to prevent his making head again: And whereas our said House of Assembly hath requested us to give directions for issuing a Proclamation, offering a reward for apprehending the said Negro called *Three-fingered JACK*, and also a further reward for apprehending each and every Negro Man Slave belonging to the said gang, and delivering him or them to any of the gaolers in this Island: And whereas, we have since received another message from our said House of Assembly, requesting us to offer an additional reward of *Two Hundred Pounds*, as a further encouragement for the apprehending, or bringing in the head of that daring Rebel, called *Three-fingered JACK*, who hath hitherto eluded every attempt against him: We, having taken the same into our consideration, have thought fit to issue this our Royal Proclamation,

Assembly*, which followed the first proclamation; two negroes, named QUASHEE, and
 SAM

hereby strictly charging and commanding, and we do hereby strictly charge and command, all and every our loving subjects within our said Island, to pursue and apprehend, or cause to be pursued and apprehended, the body of the said Negro Man named *Three-fingered JACK*, and also of each and every Negro Man Slave belonging to the said gang, and deliver him or them to any of the gaolers of this Island. And we do, at the instance of our said House of Assembly, offer a reward of *One Hundred Pounds*, and at the like instance a further reward of *Two Hundred Pounds*, to be paid to the person or persons who shall so apprehend and take the body of the said Negro called *Three-fingered JACK*. And we do, at the instance of our said House of Assembly, offer a further reward of *Five Pounds*, over and above what is allowed by law, for apprehending each and every Negro Man Slave belonging to the said gang, and delivering him or them to any of the gaolers of this Island, to be dealt with according to law.

Witness his Excellency, JOHN DALLING, Esquire, Captain-General and Governor in Chief of our said Island of Jamaica, and other the Territories thereon depending in America, Chancellor and Vice-Admiral of the same, at Saint Jago de la Vega, the thirteenth day of January, in the twenty-first year of our reign, annoque Domini one thousand seven hundred and eighty-one.

JOHN DALLING.

By his Excellency's command,

R. LEWING, Sec.

G O D S A V E T H E K I N G .

* HOUSE of ASSEMBLY, 29th December, 1780.

RESOLVED, that, over and above the reward of one hundred pounds offered by his Majesty's proclamation for taking or killing the rebellious Negro called *Three-fingered JACK*, the further reward of FREEDOM shall be given to any slave that shall take or kill the
 said

SAM (SAM was Captain DAVY's son, he who shot a Mr. THOMPSON, the master of a London ship, at Old Harbour), both of *Scots Hall* Maroon Town, with a party of their townsmen, went in search of him.

QUASHEE, before he set out on the expedition, got himself christianed, and changed his name to JAMES REEDER.

The expedition commenced; and the whole party had been creeping about in the woods, for three weeks, and blockading, as it were, the deepest recesses of the most inaccessible part of the island, where JACK, far remote from all human society, resided,—but in vain.

REEDER and SAM, tired with this mode of war, resolved on proceeding in search of his retreat; and taking him by storming it, or perishing in the attempt.

They took with them a little boy, a proper spirit, and a good shot, and left the rest of the party.

said *Three-fingered* JACK, and that the House will make good the value of such slave to the proprietor thereof. And if any one of his accomplices will kill the said *Three-fingered* JACK, and bring in his head, and hand wanting the fingers, such accomplice shall be entitled to his *free* PARDON, and his FREEDOM as above, upon due proof being made of their being the head and hand of the said *Three-fingered* JACK.

By the HOUSE,

SAMUEL HOWELL, Cl. Assen:

These

These three, whom I well knew, had not been long separated from their companions, before their cunning eyes discovered, by impressions among the weeds and bushes, that some person must have lately been that way.

They softly followed these impressions, making not the least noise. Presently they discovered a smoke.

They prepared for war. They came upon JACK before he perceived them. He was roasting *plantains*, by a little fire on the ground, at the mouth of a cave.

This was a scene;—not where ordinary actors had a common part to play.

JACK's looks were fierce and terrible. He told them he would kill them.

REEDER, instead of shooting Jack, replied, that his OBI had no power to hurt him; for he was christianed; and that his name was no longer QUASHEE.

JACK knew REEDER; and, as if paralysed, he let his two guns remain on the ground, and took up only his cutlafs.

These two had a severe engagement several years before, in the woods; in which conflict JACK lost the two fingers, which was the origin of his present name; but JACK then beat REEDER, and almost killed him, with several others

others who assisted him, and they fled from JACK.

To do *Three-fingered* JACK justice, he would now have killed both REEDER and SAM; for, at first, they were frightened at the sight of him, and the dreadful tone of his voice; and well they might: they had besides no retreat, and were to grapple with the bravest, and strongest man in the world.

But JACK was cowed; for, he had prophesied, that *white* OBI would get the better of him; and, from experience, he knew the charm would lose none of its strength in the hands of REEDER.

Without farther parley, JACK, with his cutlafs in his hand, threw himself down a precipice at the back of the cave.

REEDER's gun missed fire. SAM shot him in the shoulder. REEDER, like an English bull-dog, never looked, but, with his cutlafs in his hand, plunged headlong down after JACK. The descent was about thirty yards, and almost perpendicular. Both of them had preserved their cutlasses in the fall.

Here was the stage,—on which two of the stoutest hearts, that were ever hooped with ribs, began their bloody struggle.

The

The little boy, who was ordered to keep back, out of harm's way, now reached the top of the precipice, and, during the fight, shot JACK in the belly.

SAM was crafty, and coolly took a round-about way to get to the field of action. When he arrived at the spot where it began, JACK and REEDER had closed, and tumbled together down another precipice, on the side of the mountain, in which fall they both lost their weapons.

SAM descended after them, who also lost his cutliss, among the trees and bushes in getting down.

When he came to them, though without weapons, they were not idle; and, luckily for REEDER, JACK's wounds were deep and desperate, and he was in great agony.

SAM came up just time enough to save REEDER; for, JACK had caught him by the throat, with his giant's grasp. REEDER then was with his right hand almost cut off, and JACK streaming with blood from his shoulder and belly; both covered with gore and gashes.

In this state SAM was umpire; and decided the fate of the battle. He knocked JACK down with a piece of a rock.

When

When the lion fell, the two tigers got upon him, and beat his brains out with stones.

The little boy soon after found his way to them. He had a cutlass, with which they cut off JACK'S head, and THREE-FINGERED HAND, and took them in triumph to Morant Bay.

There they put their trophies into a pail of rum; and, followed by a vast concourse of negroes, now no longer afraid of JACK'S OBI, blowing their shells and horns, and firing guns in their rude method, they carried them to Kingston, and Spanish Town; and claimed the rewards offered by the King's Proclamation, and the House of Assembly.

THE PLAGUE.

This word in the English, and its equivalent in every other language, takes precedency in the *Anaretic* vocabulary of medicine.

Λοιμος; *pestis, pestilentia*;—the plague, pestilence.

Πληγη; *plaga, ictus*;—a stroke, a blow.

This το θειον,—this דָּבַר—this אֶפְנֵי בְּדָבָר
 “ *I will smite them with the pestilence* *,—is now as little known, as it was when Jehovah first delivered that terrible sentence against the discontented followers of Moses and Aaron.

Modern nosologists have gone no further, in general, than to observe that the plague is a

* English Bible, Numbers, c. xiv. v. 12. The LXX translate this passage Παταξω αυτους θανατω. This is not right; דָּבַר cannot be rendered θανατος, *death*. דָּבַר he spake:—a word. The word of God's wrath. מְדָבָר a desert,—an effect from the plague.

fever, the leading features of which, are exanthemata, purple spots, bubo, and anthrax.

This definition, I conceive, belongs only to a species, or rather, to a particular condition, of this disease.

History says the plague is generally the last act, in those deep tragedies, bloody wars; famine; great and distressing mutations in the seasons of the year;—and violent convulsions among mankind.

If that be true, this long absent visitor may soon return to many parts of Europe; and prove again an unwelcome guest.

Besides, the intercourse which the present times promise to establish with Eastern countries, where the plague is a native inhabitant, is a new consideration for Europe.

The philosopher, the merchant, the soldier, and sailor, are likely to become familiar with those long-interdicted regions.

On this account, as well as to guard our great commercial city against surprize, and imposture,—and not as a mere speculation on a disease that gives us no concern at present,—I have brought the subject before the publick.

In North America, lately, her wounds, from a long and sanguinary conflict, scarcely healed, the plague has burst on the inhabitants.

It

It first appeared at Philadelphia in August, 1793.

I have lately read, that this "*Yellow Fever* visited Philadelphia in 1760; and that it was then traced to have arisen from the clothes of a young man who died in Jamaica, which were sent to his friends in Philadelphia. His friends were the first who died of it; and though it extended to others, its ravages were not very extensive."

I beg leave to remark on this assertion, that the *Yellow Fever* was not in Jamaica in 1760.

The *Yellow Fever* has revisited Philadelphia, and appeared in several other towns in America repeatedly, since the year 1793.

The season of its raging in America has always been in the months of August, September, October, and November; and from the 1st of August to the 10th of November, in 1793, the deaths at Philadelphia altogether, were 4041; and in the same period, in 1798—3506. At New York, in 1795—732. In 1798—2086;—all in the same period. The statement of the deaths in 1798, at New York, was, that 329 died in the month of August, 1132 in September, 522 in October, and 83, up to the 10th of November.

The range of *Fahrenheit's* thermometer, during these four months, in 1798, at New York, was as follows:

		lowest.	highest.
August—	at sun-rise .	65°	79°
	at h. 2. p. m.	76°	96°
September—	at sun-rise .	40°	73°
	at h. 2. p. m.	52°	82°
October—	at sun-rise .	29°	64°
	at h. 2. p. m.	38°	76°
November—	at sun-rise .	30°	38°
	at h. 2. p. m.	35°	53°

The transitions in the atmosphere were considerable on particular days. On the 9th of August the increase of heat from sun-rise to noon, was 20°; on the 10th of September 14°. On the 26th of October 22°. On the 7th of November 18°.

Doctor Benjamin RUSH, of Philadelphia, a physician of the most distinguished learning and talents, has given an interesting account of this calamity *. He has denominated this pestilence the *Bilious Remitting Yellow Fever* of America; from its being accompanied by the direful complexion, and other pathogno-

* On the *Bilious and Remitting Yellow Fever of Philadelphia* in 1793.

nics, which I have given of the *Endemial Causus*, or, as it is commonly called, the *Yellow Fever* of the West Indies; and from its yielding, as he has shewn, to the same means I used in that fever, and have published in my *Treatise on Tropical Diseases*.

From the mortality that has happened, at different periods, from this *Yellow Fever*, since its first appearance in America, I am sorry to conclude that no successful method of treating it has been adopted by practitioners, and universally agreed on.

It seems that America is now suffering the same fate which England formerly experienced; and that this American plague, like the plagues in England, will exhaust the inscrutable cause which feeds its rage, and then will vanish. England was relieved from the plague, without any general rational method of cure being adopted, or without physicians knowing any more how it came, or went away, than we do when it will return.

It was natural for HIPPOCRATES, who lived in a country, where particular winds regularly produced certain diseases, to attribute all epidemics to some condition of the air, that was cognizable to our senses.

But SYDENHAM, who, we all know, was a sagacious observer of nature, and thought with HIPPOCRATES as to the atmospheric origin of epidemics, yet he contended that there was some secret and unknown quality in the air, not reducible to demonstration, by the divisions and subdivisions of theory, in which the Pandoran mischief of epidemics lies concealed.

There are annual or seasonal disorders, more or less severe, in all countries; but the plague, and other great depopulating epidemics, do not always obey the seasons of the year.

Like comets, their course is excentric. They have their revolutions; but from whence they come, or whither they go after they have made their revolutions, no mortal can tell.

All epidemics properly belong to either spring or autumn. When they break out in winter, or very early in the spring, they generally prove the most malignant and destructive. The same may be said of autumnal epidemics, in regard to their premature appearance, in summer.

Vernal pestilential diseases, and plagues, terminate, or become mild, or quiescent, in hot weather. Autumnal diseases, in cold weather.

ther. The measles and small-pox, when epidemic, do the same.

The plagues of 1119, 1656, and several others in England; of 1348, in London*, and Venice; of 1709 and 1713, in Dantzic, Hamburg, and Stockholm; all broke out during the frost in winter; and most of them declined with the summer heat. Such was the case with the plague at Toulon, in 1720 and 1721; and so it is with the plagues at Constantinople, and Cairo, where they generally make their appearance in February, and disappear about the end of June.

No person ever knew the cause of the *Sweating Sickness* in England in 1485†; nor of its periodical returns in the years 1506, 1517, 1528, and 1551;—nor why it has never since returned.

Not less extraordinary was that mortal *rot* which broke out among sheep in 1274, and raged during twenty-five years, and destroyed almost all the sheep in England. This distemper, according to historians, who must assign

* It broke out in London on the 1st of November this year. It is said that 50,000 people perished in the space of a year, and were buried in one church-yard, called the Cistercians, near the Charter House.

† It first appeared in England this year, on the 21st of September, and ceased towards the end of October.

a cause for every thing, originated in one very large sheep which was brought from Spain, by a French merchant, into Northumberland*.

As little satisfaction can be obtained concerning the origin of a singular distemper that broke out among sheep in Germany in 1552; which caused them to swell enormously, and destroyed them instantly. The country-people, who slaughtered some of these infected sheep, were seized with anthraces wherever the blood of the sheep touched them; these tumours sometimes spread and increased, and, from their inveteracy, killed many people †.

What can be said respecting the cause of the pestilential havoc among oxen in France in 1514 ‡?

Or of the canine madness, which raged, to that degree, in Jamaica in 1783, that many dogs on-board of vessels in the harbours, from Europe and North America, which were never on shore, were attacked by it, and died in the most horrible state of hydrophobia §?

What can be said likewise of the origin of that murrain, which destroyed in and

* BAKER, Chron. p. 101.

† WIERUS *de Præstig. Dæmon.* lib. 4. c. 30.

‡ FERNELIUS *de Morb. Universal.* lib. 3. c. 12.

§ Treatise on Tropical Diseases, Ed. 3. p. 44.

about London, upwards of 100,000 cats in 1797?

Who can say how it happens, that one species of animal, and not another, suffers so severely on these occasions?

In diseases, even of confined local production, we are often deceived by the semblance of truth.

Has any person hitherto a rational cause to assign for Agues in the hundreds of Essex; or the Bronchocele in Alpine countries?

What did PLINY know of the *Gemursa*; or what do we know of the *Mentagra**?

To look for the cause of an epidemic in the present state of the air, or weather, when it makes its appearance, is a very narrow, contracted, method of scrutiny.

The cause of a pestilence in summer may be in the changes which the earth, and consequently its surrounding atmosphere, underwent in the preceding winter; and from combinations, perhaps, far beyond our scope of thought, for years preparatory to its eruption.

In a new country like North America, where immense districts of the surface of the earth, which from the creation never saw the sun, have been exposed, for agriculture, the air of

* PLIN. lib. XXVI. c. 1.

the country must have been impregnated from exhalations injurious, probably, to its salubrity.

The Americans are not to look for the cause of their *Yellow Fever* on dunghills, in rotten vegetable substances, and about the wharfs and neighbourhood of Philadelphia. Nature does not deal in such commodities. She does nothing on so small a scale.

This pestilence has a far more expanded origin. And I verily believe, that their melancholy officers of health, avoiding what they call infected persons, and putting marks on the doors and windows of an house where any person is ill, and similar acts of charitable and good intention, only tend to frighten the people, and dishearten them, at a time they stand most in need of fortitude*.

Exposing the well-known umbrous *Pontini* marshes, by cutting down the woods, which kept their foul vapours from being rarefied by the sun, and borne away by the winds, produced great pestilence in Italy.

The idea also of the American plague being imported from *Bulam*, or the West Indian

* In London in 1665, during the plague, a large red cross was put on the houses of the sick: with, "Lord have mercy on us." "Pray for us." This drove away all assistance. It could not be otherwise. It was consigning them to the grave.

islands, or any other place, is repugnant to reason. I was told a similar tale, when I first went to the West Indies: that the *Yellow Fever* there, was imported in the beginning of the century from *Siam*. That it was a contagious, and an original putrid disease; and that bleeding was death. In my practice I proved the reverse of all this.

The cause of pestilential epidemics cannot be confined, and local. It must lie in the atmosphere, which surrounds, and is in contact with every part of us; and in which we are immersed, as bodies in fluids.

These diseases not appearing in villages, and thinly inhabited places, and generally attacking only great towns and cities, may be, that the atmosphere, which I conceive to be the universal propagator of pestilence, wants a commixture, or union, with some compounded, and peculiar air, such as is generated in populous communities,—to release its imprisoned virulence, and give it force*.—Like the divided seminal principles of many plants, concealed in winds, and rains, until they find suitable materials and soil, to unite their se-

* THORESBY says, in 1645, when the plague was at *Leeds*, in Yorkshire, that the birds fell down from the air, in their flight over the town.

parated atoms ; they then assume visible forms, in their own proper vegetation.

Diseases originating in the atmosphere, seize some, and pass by others ; and act exclusively on bodies, graduated to receive their impressions :—otherwise whole nations would be destroyed.—In some constitutions of the body the access is easy, in some difficult, and in others impossible.

The air of confined places may be so vitiated, as to be unfit for the purposes of the healthy existence of any person. Hence jail, hospital, and ship fevers. But as these distempers are the offspring of a local cause, that local cause, and not the distempered people, communicate the disease*.

I know it is thought otherwise by FRACASTORIUS, the inventor of contagion, and his followers †.

* The 93d regiment, destined for the *San Juan* expedition, which arrived in Jamaica in 1780, brought with them the gaol-distemper. All the men taken from the jails, died on the passage ; or soon after their landing in Jamaica. No others were affected by it.

† Vidimus anno 1511, quum per Germanos Verona teneretur, exorta peste, quo hominum fere decem millia periere, ex una veste pellica, non pauciores quam quinque & viginti Teutones obiisse ; uno defuncto alius induebat eam vestem, & hoc alius, & alius donec moneracti è tot defunctis vestem combussere." *De Contag. Morb. Curat.* lib. iii. cap. 7.—See *Treatise on Tropical Diseases*, Ed. 3. p. 268.

Plagues, and pestilences, the produce of the great atmosphere, are conveyed in the same manner, by the body being in contact with the cause; and not by its being in contact with the effect.

If pestilences were propagated by contagion, from infected persons, the infection must issue from their breath, or excrements; or from the exhalations of the bodies of the diseased.

In support of the last circumstance, the black Affizes at Oxford in 1577 has been often instanced by authors; and that the judges, jury, and attendants, were destroyed by the infection brought into the court by the prisoners. How could this be, when the prisoners were not ill themselves?

Insulating the sick, and debarring all intercourse with them, according to the doctrine of contagion, would bound and stop the spreading of diseases.

This was tried at Marseilles in 1721, without effect. The Capuchins, the Jesuits, the Recollets, the Observantines, the Barefooted Carmelites, the Reformed Augustines, all the Grand Carmelites, the Grand Trinitarians, the Monks of Loreto, of Mercy, the Dominicans, and Grand Augustines, who kept themselves
secluded

fecluded in their feveral convents, and took every precaution againft all communication from without, perifted equally with others, by the plague*.

The infection, if it were not in the atmosphere, would be confined within very narrow limits; have a determinate fphere of action; and none but phyficians and attendants on the fick would fuffer;—and thefe muft fuffer; and the caufe, and the effects, would be palpable to our fenfes. Upon this ground, the precaution of quarantine would be rational. But who then would vifit, and attend the fick, or could live in hospitals, prifons, and lazarettos?

I had occafion to notice, in a former publication, what I have here repeated relative to the vigilance ufed in vain at Marfeilles; and alfo that RHAZES lived 120 years, and often practifed in plagues; that HODGES remained in town and attended a multitude of fick during the great plague in London in 1665; that KAYE was in the midft of practice in the fwearing ficknefs in 1551; and without any inconvenience. PROCOPIUS informs us, that during a terrible plague at Conftantinople in 543, which almoft destroyed the

* *Journal de la Contagion à Marfeilles*, p. 42.

whole city, no physician, or other person, got the plague by attending, dressing the sores, or touching the sick *.

The small-pox, measles, yaws, and lues venerea, know no distinction as to habits of body. Every human being is susceptible of their morbid infection.

The two first diseases are truly contagious, according to the common acceptation of the word in regard to fevers; and there is no securing any person against being infected, who comes into the impregnated atmosphere of a subject labouring under these diseases. Their infection, as well as that of the other distempers, may also be put, by inoculation, into the habit of the strongest man, or the weakest child. This cannot be done from the American *Yellow Fever*; nor from the suppurated, glandular, or cuticular matter, of any other pestilential fever.

This convinces me that bubo, and carbuncle, which we hear so much of in Turkey, and read so much of in our own history of plagues, arise from heating food, and medicines; or from a defect, in not bridling the vehemence of the distemper, by a reverse method of treatment. These suppurations contain no in-

* *De Bello Persico*, lib. 2. cap. 22.

fection, and consequently are not the natural deposit of the morbid virus, separated from the circulation.

The ancient writers on medicine, and indeed all others, which I have read, assert, that the operation, of whatever they assign to be the cause of epidemical fevers,—is solely on the blood and fluids. This may be doubted.

The impressions of the atmosphere, on the surface of the body, when contaminated, or deprived of vitality, like East winds, are as perceptible, as the effects of approaching, or retreating from, a fire.

In the common order of pestilential fevers, they commence with coldness, and shivering; simply demonstrating, that something unusual has been in contact with the skin, agonizing cutaneous sensibility.

The skin is covered with the extremities of fibres, nerves, and vessels;—these are in the most exposed situation, with the least power of resisting external injury.—Hence a destruction, or a privation of their elasticity, and restraining power, from a poisoned atmosphere.—And hence I conceive that the first blow in these fevers is made on the solids;—the strength of the whole frame is thus prostrated
in

in a moment, and every nerve and muscle paralyzed.

In a similar manner, perhaps, the dense and concentrated vapour, from the *grotto di cani*; the bottom of brewers porter vats; minerals; vaults; wells; and subterranean caverns, when drawn into the lungs, destroy their functions mechanically.

Sickness at the stomach, and an immoveable pressure about the præcordia follow. These demonstrate, that the blood cannot pervade the extremities of the body, and that the quantity which ought to dilate through the whole machine is confined to the larger organs, and is crowding, and distending the heart, and central vessels.

The restraining power of the remoter blood vessels being destroyed, the thinner parts of the blood escape their boundaries; hence arises yellowness in the skin, in some climates:—in others, the extravasated grosser parts of the blood stagnate, forming black lodgements, bubo, anthrax, and exanthemata.

The object in these fevers, is to decide the contest between the solids and the fluids; and this appears to me to be only practicable, when spontaneous sweats do not happily appear, or cannot be raised in the manner I shall presently

presently mention, by a cooling regimen; and by draining the vital parts, by bleeding and purging, before the fluids have burst their confines, and dissolved their bond of union with the solids.—The next step is to regain the lost energy of the surface of the body, by exciting perspiration; and then of the whole system, by tonics.

When these things are not done in the first hours of attack, in pestilential fevers, and the conflict is not *extinguished* at once, attempting to extort sweats from the body, by heating alexapharmics, will do mischief;—and bark, wine, stimulants, and cordials, may be called on—like undertakers—to perform an useless ceremony.

I am well aware of the objections that have been urged against bleeding in pestilential diseases, by inexperienced theorists; and by people who do not make just discrimination.

Debility of mind, and body; no thirst, and nothing indicative of fever in the pulse, though not the ordinary method of attack, frequently occurred at Nimeguen in 1636, and also in London in 1665; and proved as fatal as when the disease came on with the most intense heat, unquenchable thirst, dryness and
blackness

blackness of the tongue, and intolerable burning about the præcordia *.

In the former case, no person would think of taking away blood. Bleeding has seldom been fairly used; nor does any writer, excepting BOTALLUS, appear to have duly considered its operation, extent, and time of execution, in various diseases †.

It is not a few ounces of blood, however well timed, and if not well timed bleeding should not be performed at all, that will answer the end in the Yellow Fever, or in the Plague.

Here lies the mistake of medical men in these diseases; and hence the violent clamours against bleeding. Such people only reprobate bleeding in pestilential fevers, who never saw it used in a proper manner. It has either been performed on improper subjects, or too late, or in too small a quantity, and where the practitioner has stopped at one, or two bleedings, when five or six, or what I have often known, ten or twelve, ought to have taken place.

If bleeding be not the chief staff on which we can rely, or some safe and immediate eva-

* DIEMERBROECK. HODGES.

† BOTALLUS, *Cap. 7. de curat. per sang. miss.*

quant, whose operations can be directed finally to the skin, and terminate in sweat—such as the *Vitrum Antimonii*, used in the manner, and with the precautions, by which I cured pestilential dysenteries in the West Indies *, practitioners will be in an hopeless situation when the plague returns.

There never was any medicine hitherto used that has produced the smallest opposition to the progress of this disease, either in the cases of individuals, or in communities.—It has raged on, proved fatal, and disappeared. Who can expect to find a specific rapid enough in its operation for furious pestilential fevers, which sometimes destroy in a few hours, and often without a second exacerbation ?

Drugs cannot travel through the veins and arteries like the lightning of the plague. Their creeping course only suits the lingering steps of slow, diuturnal maladies ; and chronic, lymphatic indispositions.

SYDENHAM, consistently with his general principles, caught the idea of bleeding copiously in the plague, and was impressed with the soundness of the doctrine ;—but he durst not give full exercise to his genius.

* See *Treatise on Tropical Diseases*, Ed. 3. p. 232, 233. 252, 253 ; and *Gentleman's Magazine* for the month of June, 1797, p. 461.

The prejudice in his time against bleeding in any disease was great, and the hot regimen practitioners were numerous and powerful; and he had also, by his absenting himself from London in 1665, during the violence of the plague, made it necessary that he should be cautious in his practice when he returned, as he had lost a glorious opportunity of rising above censure, and benefiting the world.

Besides, his leaving the town at such a time might make the reliance he had on his own skill suspected. In defence of bleeding in the plague, he produces the names of several excellent physicians prior to his own time; among whom the admirable *BATALLUS* seems to have decided his determination.

During the civil war, the year he does not mention, I suppose it was in 1647, he gives an instance of its good effects among the troops at *Dunstar Castle*, in Somersetshire; which account was given him by Colonel *FRANCIS WINDHAM*, governor of that Castle.

He says, "it happened at that time, that a surgeon who had travelled to foreign parts, was in the service there, who applied to the governor for leave to assist his fellow-soldiers who were afflicted with the plague, in the best manner he could. This was granted. He

took away so large a quantity of blood from every patient at *the beginning of the disease*, and before any swelling appeared* ; that they were ready to faint, and hardly able to stand ; for he bled them all standing, and in the open air, and had no vessel to measure the blood, which falling on the ground, the quantity each person lost could not be known. The operation being over, he ordered them to their tents ; and, though he used no other remedy than bleeding, yet of the numbers that were thus treated, not a single person died †.”

I shall mention the practice of another physician, the celebrated empirical Doctor Thomas DOVER.

He says, in his *Ancient Physician's Legacy to his Country* ‡, when he was at “ the storming of *Guiaquil*, under the line, in the South Seas, it happened that, not long before, the plague had raged there. For our better security, therefore, and keeping our people together, we lay there in the churches, and brought thither the plunder of the cities. We were much annoyed by dead bodies.

* SEPTALIUS, RIVERIUS, and several others, bled after spots, tokens, buboes, and suppuration of the parotids, with success.

† *Oper. Univer.* Ed. 1741. p. 119.

‡ Ed. 8. pag. 100, 101, 102.

These bodies could hardly be said to be buried; for the Spaniards abroad use no coffins, but throw several dead bodies one upon another, with only a draw-board over them; so that it is no wonder we received the infection.

“ In a very few days after we got on board, one of the surgeons came to me, to acquaint me, that several of my men were taken after a violent manner, with that languor of spirits, that they were not able to move.

“ I immediately went among them, and, to my great surprize, soon discerned what was the matter. In less than forty-eight hours we had in our several ships one hundred and eighty men in this miserable condition. I ordered the surgeons to bleed them in both arms, and to go round to them all, with command to leave them bleeding till all were blooded, and then come to tie them up in their turns. Thus they lay bleeding and fainting so long, that I could not conceive they could lose less than an hundred ounces each man.

“ Notwithstanding we had an hundred and eighty odd down with this distemper, yet we lost no more than seven or eight; and even these owed their deaths to the strong liquors which their mess-mates procured for them.

“ They had all spots, which in the great plague they called tokens ; few or none of the Spaniards escaped death that had them ; but my people had them and buboes too.

“ Now, if we had had recourse to alexipharmics, such as Venice Treacle, Diascordium, Mithridate, and such like good-for-nothing compositions, or the most celebrated Gascoigne’s powder, or Bezoar, I make no question at all, considering the heat of the climate, but we had lost every man.”

HODGES was of the old school in physic. He was an enemy to bleeding. He was a man of little reflexion, and no genius. He pursued the beaten track of alexipharmicks, and heating medicines. In his account of the plague in London of 1665, though he had abundance of opportunity, he made no discovery. He lost all his patients. The sick who recovered with him, were indebted to nature ;—a rough physician on all occasions.—None but the strongest-constituted people ever escape under her hands alone.

This fact was illustrated here.—Women, children, and weak, scorbutic people, all perished.

HODGES, however, did all the good he could. Like a brave mariner, though he
knew

knew not the use of compass, or quadrant,—he plied the oar, or stood to the helm, in that tempestuous “sea of troubles.”

The Doctor, if he were not skilful, he was honest. He gave his patients what he took himself. He endeavoured to cure them by his own preventive.

The Doctor loved old *Sack*. Like the elder CATO*, he warmed his good principles with good wine.

He modestly says, “before dinner I always drank a glass of sack, to warm the stomach and refresh the spirits. I seldom rose from dinner without drinking more wine. I concluded the evening at home, by drinking to cheerfulness of my old favourite liquor, which encouraged sleep, and an easy breathing through the pores, all night †.”

HODGES always went about the town with his apothecary; his constant companion and friend. These two, in the course of their morning rounds, usually visited as many sack-shops as patients.—They had great practice.

There was a different tincture of character in these gentlemen. The doctor was bold;

* “*Narratur et prisca Catonis,*

“*Sæpe mero caluisse virtus.*”—Hor. Od. 21. l. 3.

† *Loimologiæ*, sect. 8.

the apothecary timid :—but they hunted like true Arcadians. The doctor entered the most infected houses without fear ; the apothecary remained behind in the sack-shop, waiting for the prescription. The doctor saw death as a subject of speculation. The apothecary speculated on life, and saw her in brighter colours, proportionate to the operation of the doctor's prescription :—I mean that which the doctor took himself,—“SACK, *middle-aged, neat, fine, bright, racy, and of a walnut flavour* *.”

I have no doubt but that Sack was of great use to HODGES, while he kept within bounds,—for excess is destruction ;—and, as far as it acted as a gentle stimulus to his mind and body ; and kept them in such a state of unison, as to enable the mind to act without fear, and the body without lassitude.

This is the great prophylactic against all pestilential diseases ; and is effected by temperance, and calmness of mind ;—avoiding fatigue, and heating the body ;—a nourishing diet ; cleanliness ; proper cloathing ; and keeping the excretory functions in a regular performance of their offices.

* *Loimologia*, sect. 8.—HODGES, to the disgrace of thousands whom he had served, fell into extreme poverty, and died in jail in 1684.

Veteran physicians in times of danger generally desert the field; intrench themselves far off, behind old books, and leave raw recruits to fight the foe; who, inexperienced in the tactics of physic, seldom escape the recoil of their own artillery; and fall with the patients.

Few people in such times are to be found, inclined to secure their souls, at the expence of their bodies; like father Francis GARASSE. This pious jesuit, in order to purchase the crown of martyrdom, obtained, by repeated solicitations, permission from his superiors, to attend the sick, during the plague at Poitiers in 1631. In this benevolent office, the virtuous GARASSE, to his great consolation, got the plague and died.

BAYLE says, in enumerating the particulars of his character, that “this last action of his was very fine.”

In times of pestilence, the sick are always neglected. For this, many causes may be assigned. Self-preservation has superior influence to every other consideration. In the plague of 1665, it is supposed that one-third of the people who died, had no aid or assistance; and that the greater part of that number

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ber perished in houses shut up, alone, and helpless*.

The clergy at that time left their flocks to take care of themselves; and it was common to see written on the church-doors, “*here is a pulpit to let,*”—“*here is a pulpit to be sold.*”

At that period of our history, there was a great deal of religion in England; and the people were much distressed at the desertion of the clergy.

Among the few of this order, that had zeal, or courage enough to remain at their posts, was the celebrated minister THOMAS VINCENT, who in his *God's Terrible Voice to the City*, has given a very animated picture of that pestilence. Many facts which constitute part of these observations on that dreadful event, are known but to a few people; and I hope will contribute to illustrate that momentous affliction, one of the greatest England ever suffered.

The first person who was attacked, died in the parish of *St. Giles's* in the fields on the 27th of December, 1664. The disease then remained quiescent until the month of May following, and, according to the account rendered in to

* Such was the devastation of this pestilence, that grass grew in Leadenhall-street, Bishopsgate-street, Cornhill, Exchange, and Cheapside. Bucklersbury was free from the plague, being at that time chiefly inhabited by apothecaries and druggists.

the government by the company of parish-clerks, with which Mr. VINCENT's exactly agrees, now before me, the progress of the mortality was as follows.

			Died.
Anno 1665,—	May	from the 2d to the 9th	* 9
	Ditto	from the 9th to the 16th	3
	Ditto	from the 16th to the 23d	14
	Ditto	from the 23d to the 30th	17
	June	from the 30th May to 6th June	43
	Ditto	from the 6th to the 13th	112
	Ditto	from the 13th to the 20th	168
	Ditto	from the 20th to the 27th	267
	July	from the 27th of June to July 4	470
	Ditto	from the 4th to the 11th	725
	Ditto	from the 11th to the 18th	1089
	Ditto	from the 18th to the 25th	1843
	Ditto	from the 25th to August 1	2010
	August	from the 1st to the 8th	2817
	Ditto	from the 8th to the 15th	3880
	Ditto	from the 15th to the 22d	4237
	Ditto	from the 22d to the 29th	6102
	September	from August 29 to September 5	6988
	Ditto	from the 5th to the 12th	6544
	Ditto	from the 12th to the 19th	7165
	Ditto	from the 19th to the 26th	5533
	Ditto	from the 26th to the 3d of October	4929
	October	from the 3d to the 10th	4327
	Ditto	from the 10th to the 17th	2665
	Ditto	from the 17th to the 24th	1421
	Ditto	from the 24th to the 31st	1031
	November	from October 31 to November 7	1414
	Ditto	from the 7th to the 14th	1050

* St. Giles's in the fields 3; Clements Danes 4; St. Mary Westchurch 1; St. Andrew Holborn 1.

Ditto

	Died.
Ditto - from the 14th to the 21st - -	652
Ditto - from the 21st to the 28th - -	333
December from November 28 to December 5	210
Ditto - from the 5th to the 12th - -	243
Ditto - from the 12th to the 19th - -	68

There were some deaths after this, making the total amount, before the end of the year, 68,596.

The history of plagues, and pestilential diseases, is an history of superstition, and credulity.

The Romans, after the overthrow of the Samnites, were afflicted by a plague. They sent an embassy to Greece for the god *Æsculapius*, who was then worshiped in Epidaurus, a city in the Peloponnesus, under the figure of a serpent. After a year's expectation the god arrived, to the great joy of the people, and the plague ceased. Superstition then was at so great an height, that the Romans had no idea that the god came "a day after the fair."

On another occasion they had recourse to the Sibylline books; in which a passage was construed, that some great crime had drawn down the wrath of the gods upon their republic. A vestal was found guilty of incontinence, and to appease this plague, she was buried alive.

The

The city of Tyre had long been exempt from the plague, when furrounding countries had been forely afflicted by it. Maximin, the tyrant there, attributed this, during the former part of his reign, to his zeal in perfecuting the Christians, and putting out the right eye of every one of those whose lives he spared, in his dominions.

The destruction, and annihilation of the people of Basilica (antient Sicyon), by a plague, was said by the Christians to have been occasioned, from the Turks reading the Koran, for the first time, in a church, which these infidels had converted into a mosque.

Nothing inferior to this, in human weakness, was the statute 1. Jac. I. c. 31. sect. 7. in England; by which sick people going out of their houses, who were ordered to keep at home, if they had no fores on them, were punished only as vagrants; but if they had any fores, it was felony!

In 1665, it was said that a globe of fire was seen over the part of ~~the~~ London where the solemn league and covenant was burnt; and that this was the cause of the plague. Some charged it to the reign of the Stewarts. Others attributed it to planetary influence, particularly to the effects of the great conjunction

junction of Saturn and Jupiter, which happened in fourteen degrees of Sagittarius, on the 10th of October, 1663 *.

Solomon Eagle, a well-known fanatical mad quaker, at that time, went about the streets naked, with a pan of burning charcoal on his head, denouncing the city of London for its crimes; and proclaiming every day, that the plague was not to end until the people were sufficiently punished for their wickedness.

* Ad hoc etiam caufarum genus, aëris nimium vitium, referuntur *maligni fyderum inflexus*, qui variis modis corpora viventium afficere confueverunt. Hujusmodi effe, aiunt, *coitum planetarum superiorum*, Saturni, Jovis, & Martis in *signis humanis*, qualia funt. *Vergo, Gemini*, ac tum potiffimum, cum Mars dominatur." &c.

"Cum enim morbi pestilentes sæpe eveniant, nulla facta in aëre, quoad primas qualitates insigni mutatione; sed iis grassantibus aër purus admodum appareat, & purior interdum quam sub aliis constitutionibus non pestilentibus, neque præcesserint tempora admodum calida & humida, ex quibus insignes putredines solent exoriri; conjiciendum est, a maligno quodam fyderum influxu morbos istos pestilentes originem traxisse. Adde, quod *pestes media hyeme* sævire soleant; quas nulla in primis qualitatibus insignis alteratio præcessit. Tunc enim *occultis fyderum vivibus* hujusmodi morbi assignandi sunt, cum vim habeant corrumpendi aërem, non facta in eo insigni aliqua mutatione, secundum primas qualitates. Et illud est divinum in morbis, quod agnovit HIPPOCRATES, & GALENO interprete." &c.

"Ad idem caufarum genus referri solent, *luminarium defectus* & *eclipses*, *insolita meteora*, & præsertim *cometæ*, qui nunquam apparere solent, quin morbi epidemici ac pestilentes, variæque in mundo mutationes subsequantur prout multarum historiarum experimentis confirmatum est." L. RIVERIUS *de Febre Pestilenti*. Op. Med. Univ. Ed. 1679, p. 447, 448.

Others

Others prayed that all the quakers should be sent out of the land, and that nothing else could stop the pestilence.

The nonconformists taking another turn, asserted, that after their first fast day on the occasion, "the Lord began to remit, and turn his hand, and cause some abatement of the disease:"—when it ceased, they fancied that their fasting had extinguished it.

In recording this dreadful story, some writers have solemnly affirmed, that there were marks, or tokens of the plague, on the walls of infected houses, as mentioned in the Bible; and that these marks, or tokens, often broke out again on the walls, as they did in the leprous houses among the Hebrews, "*with hollow streaks, greenish or reddish* *," after they had been scraped and cleansed away.

The same superstitions prevailed after the great fire of London, in the following year. On this occasion, there was a wooden figure of Bacchus set up against the corner of an house in Pye-corner, where the fire stopped; with an inscription on his belly, to acquaint posterity, that the fire was a punishment for the sin of gluttony in the city. The cause of this

* *Leviticus*, chap. 14.

ludicrous opinion was, that the fire began in *Pudding-lane*, and ended in *Pye-corner*.

In confirmation of what I have lately, and now said, and what I many years ago advanced respecting contagion, and infection in pestilential fevers, a very important fact resulting from BUONAPARTE'S expedition into Syria, in the beginning of 1799, has within these few weeks appeared, which will not be passed unnoticed by judicious physicians.

BERTHIER, in his account of that expedition, says,—“ At the time of our entry into Syria, all the towns were infected by the plague, a malady which ignorance and barbarity render so fatal in the East.

“ Those who are affected by it give themselves up for dead ; they are immediately abandoned by every body, and are left to die, when they might have been saved by medicine and attention.

“ Citizen DEGENETTES, principal physician to the army, displayed a courage and character which entitle him to the national gratitude.

“ When our soldiers were attacked by the least fever, it was supposed that they had
caught

caught the plague, and these maladies were confounded. The fever hospitals were abandoned by the officers of health, and their attendants. Citizen DEGENETTES repaired in person to the hospitals, visited all the patients, felt the glandular swellings, dressed them, declared and maintained that the distemper was not the plague, but a malignant fever with glandular swellings*, which might easily be cured by attention, and keeping the patient's mind easy.

“ He even carried his courage so far as to make two incisions, and to inoculate the suppurated matter from one of these buboes above his breast, and under his arm-pits, but was not affected with the malady.

“ He eased the minds of the soldiers, the first step to a cure; and, by his assiduity and constant attendance in the hospitals, a number of men attacked with the plague were cured. His example was followed by other officers of health.

“ The lives of a number of men Citizen DEGENETTES was thus instrumental of saving.

* DEGENETTES'S views in making this distinction were highly commendable; but certainly this fever was the plague.

“ He dismissed those who had been ill with the fever and buboes, without the least contagion being communicated to the army*.”

From the medical men of letters on that expedition, much more may be expected as to the treatment of the plague; and I understand that the world will soon be gratified on this subject by BERTHOLLET and his coadjutors.

Importing plagues,—like the existence of contagion in pestilential fevers,—is contrary to the opinion I ever had, and still maintain.

From whence was the importation of the plague at Naples in 1656; by which 20,000 people died in one day?

Can any person, for a moment reflecting, believe that the great plague of London in 1665, which imagination traced from the Levant to Holland, and from Holland to England, was caused by opening a bag of cotton in the city, or in Long Acre; or a package of hemp in St. Giles's parish?

Is it possible to suppose that people should have been found to propagate, or believe the

* English Ed. p. 83.

well-known and favourite story of the advocates for MEAD's theories,—that a lady was killed instantly by smelling at a Turkey-handkerchief; and a gentleman by only walking over a Turkey-carpet!

One might ask—what became of the persons, who delivered the handkerchief to the lady—and laid down the carpet for the gentleman?

How was the infection carried to the interior of Tartary, where it made its irruption on the world in 1346?

It is said that this plague depopulated two hundred leagues of that country, and destroyed serpents, birds, insects, and even trees. It spread to other parts of Asia, and the East Indies; and into Africa, Egypt, Syria, Greece, and the islands in the Levant; and at length into every part of Europe, and continued its devastations, in different countries, for the space of five years.

In 1347 it appeared in the Mediterranean islands, at Pisa, and Genoa. In 1348 in Dauphinè; and also in Catalonia, and other parts of Spain, and converted Florence into a desert*. In 1349† it invaded England; and, within the

* Vide BOCCACCIO, *Decamerone, Giornata Prima.*

† It broke out in London in November, 1348. See page 213.

space of one year, made almost a desert of London.

In this year also, it broke out in Scotland, Ireland, and Flanders. In 1350 in Germany, Hungary, and Denmark. It is recorded that this five years plague, destroyed half the number of the inhabitants of the countries it invaded. This plague, the severest and most general in history, is said to have originated in Tartary, from an intolerable stench which arose from the earth.

This is a cause of pestilence much more rational than rotten vegetables, bales of goods, silk handkerchiefs, and Turkey carpets.

Earthquakes are generally succeeded by pestilential fevers. The poison is thrown out of the earth, and contaminates the atmosphere. Exhalations from the exposed beds of rivers operate in the same manner.

In 1539 a pestilence made great havock in England. There was a great drought that year. Most of the wells throughout the country were dried up. The beds of all the small rivers, from the defect of water, were fermenting mud. The sea water flowed above London bridge.

I have seen almost all the lazarettos, hospitals, and prisons in Europe. The worst governments

vernments abroad, most abound with this splendid inheritance of paupers, and criminals;—the children of bad state-parents.

Even in these false, cheating monuments of superstition,—these impositions on credulity and benevolence,—where pomp and magnificence are pictured without,—and neglect, dirt, misery, and often malicious oppression, found within, I never could discover that fevers are propagated by contagion. Were it possible so to be, I should have been long since dead.

Quarantine, always expensive to commerce, and often ruinous to individuals, is a reflexion on the good sense of countries.

No pestilential, or pandemic fever, was ever imported, or exported; and I have always considered the fumigating ship-letters, and shutting up the crews and passengers of vessels, on their arrival from foreign places, several weeks, for fear they should give diseases to others, which they have not themselves—as an ignorant, barbarous custom.

Speaking thus decidedly, against the general opinion, and practice, I may possibly incur the imputation of rashness, from the timid;—from those who believe in their fears;—

and from some who adopt opinions on tradition, without examination.—But these are my sentiments.—This is the way I take, to serve my country, regardless of the narrow notions of vulgar prejudice. For, from what has lately occurred in our metropolis, it is not difficult to foresee, should the plague, or any pestilential fever like the plague, appear, how distress and misery would multiply, through false alarms, misrepresentations, ignorance, and imposition.



HOSPITALS.

If plagues and pestilential fevers were contagious, and generated from local materials only, independent of some disposition in the atmosphere, no populous city would ever be free from them; the Great Hospital at Naples, *di Santa Maria del Popolo*, or *Spedale Incurabili*, would furnish sufficient infection to contaminate the universe.

This hospital, so vaunted by the Neapolitans*, and so talked of by superficial travellers, is the worst-conducted hospital in Europe. It contains 1200 of the filthiest beds I ever saw. The air of the wards is insupportably offensive; the floors, and the walls, are abominably nasty.

In such a climate, these things are bad enough; but I wish this was all I could say

* Uno de' più magnifici Ospedali d'Europa, per la vastità e magnificenza.

against this *grand* and *magnificent* building—so fair without, so foul within.

On this subject, I shall make only some cursory observations relative to the principal hospitals in Italy; as this country has lately suffered great changes, that future physicians may form an idea of the state in which they were before these changes happened; particularly in the year 1787.

In this great *Spedale Incurabili* at Naples, there is a particular ward, where all the worst cases are indiscriminately placed. Here are some dead, some just expiring, some in their perfect senses, broken-hearted, calculating the minutes to their inevitable fate. Many are here also who might recover, with proper care, if all hopes of life were not extinguished by the shocking scene before their eyes.

There were 138 insane and idiotic people in appropriated apartments belonging to the hospital. The proportion of idiots was greater than I ever met with in any other country. These mad people, and idiots, were all naked. The climate is no excuse. The filth, stench, and wretchedness of their births, or cribs, constructed like those of the wild beasts in the Tower, exceeded all description.

Among

Among the insane, there was a boy about fourteen years old, who had not slept for three years; but raved day and night without ceasing a moment, or ever closing his eyes.— I never saw, or read of, a similar case*.

The treatment of the insane here is very different from that which the insane experience in Rome.

In the Great Hospital in Rome the *Spedale di San Spirito, in Saffia*, there were at this time 816 patients, besides 108 insane, or foolish, on the establishment. The insane here are treated with the utmost skill and tenderness.

There is also every possible care taken of the sick; but few recover. It cannot be otherwise, where people are so crowded together, in such a climate, with low malignant remitting fevers; the produce of Rome, and the Campania. The wards are 45 feet wide, and about as many feet in height; much the same as they are in all the other hospitals in Italy. But the sick are more crowded in this hospital than in any other. There are six

* DOCTOR MENGHIN shewed me an uncommonly restless mad patient in the Hospital at Inspruck; who always either laughed or cried violently when she was spoken to. Her insanity arose from a sudden suppression of the menses.

rows of beds in the wards, ranged head to foot, with a space of three feet between each row.

There are many other hospitals in Rome; but this, and the *San Gallicano*, and the *Consolazione*, are the principal.

The hospital *di S. Gallicano* is chiefly for the reception of people afflicted with the *Tinea*, or scalled-head; which is a dreadful disorder in and about Rome. There were sixty patients in the hospital when I was last at Rome in 1787.

The manner of curing this disorder there, is curious, but extremely coarse. I often visited this hospital, and communicated my opinion of this barbarous practice to the learned SALACETI, the Pope's physician.

Their operators first cut off the hair as short as they can; then pluck up by the roots, with a pair of pincers, the remainder, a little at a time, as the patient can bear the torture, until they have pulled out all the hair. They then scarrify the head slightly with a razor, or scalpel, and let out the blood, more or less, as they find occasion. They finish the cure after this, with a cap besmeared with oil.

The *Spedale di Consolazione* is solely for wounds and fractures. When I was there, there

there were 50 men and 17 women in it. The Roman surgeons in this hospital, in all fractures of the thigh-bone, keep the injured limb straight and extended to the length of the other, during the whole cure. They keep the limb in the same position in fractures of the patella. It is foreign to my present purpose to enter into a discussion on this practice; but they succeed better than the surgeons do in England, by their method.

The best-regulated hospitals in Europe are at Venice, Bologna, Milan, and Florence.

The military hospital of *San Servolo* is the only one in the Venetian territories under bad management. Here I saw men crawling about in the wards, with dysenteries, and some dying in their beds, with heavy iron chains on their limbs. There were 40 insane people in the hospital. The establishment finds rooms and physicians for these insane people, but their respective friends every thing else.

The hospitals in France, particularly the *Hotel Dieu* at Paris, and at Lyons, were at this time under much more salutary regulations than they were formerly; when it was a common practice to put four patients in
one

one bed, and frequently the dead, dying, and recovering, were lying together.

Those in Germany have undergone no improvement within my memory.

There is at Turin an excellent hospital for orphans, and worn-out, helpless, and aged people; the *Spedale della Carita*. There were in it 1800 females, and 1200 males, when I was there. The whole establishment consists of 3463 persons.

The following account of the number of beds, and sick, in other hospitals on the Continent, was accurate in 1787; and nearly the same in 1783, 1785, 1786, and 1791.

Frankfort, 36 sick. Strasburg, 1800 beds, 205 sick in the military hospital; the garrison consisted of 8000 men; and in the town hospital, 500 beds; 260 sick. Inspruck, 300 beds, 100 sick. Verona, 50 beds in the *Sancta Domus Pietatis*; 70 beds in the *Misericordia*; and 1000 in the *Infantes Expositi*. Padua, 140 beds. Venice, 160 beds in the *Ospedaletto*; 35 beds in the *Ospedale Dei S. Pietro e Paulo*; and 100 beds in the *Ospedale di Mendicanti*. Bologna, 144 beds in the *S. Maria della Morte*; and 88 beds in the *S. Maria della Vita*. Rome, 200 beds, 137 sick in the *Incurabili*. Florence, 650 sick in the *Spedale di Santa*

Santa Maria Nuova: the *Spedale di Bonifacio* was undergoing alteration, and had no patients in it then. Milan, 1400 in the *Spedale Maggiore*. Turin, 500 beds for the sick in the *Spedale Giovani*. Chambery, 35 sick in the *Hotel Dieu*. Montpellier, in the *St. Eloi*, 300 beds. Chalons, *sur Saone*, 200 beds. Lyons, 900 sick in the *Hotel Dieu*. Paris in *la Charitè*, about 300; in the *Hotel Dieu* 2611 sick; there have been 5000. Lille, in the *Hôpital Général* 2500 people of all descriptions.

Some have lived in the State of Virginia
 was undergoing instruction, and had no patients
 in it then. Others, also in the State of Virginia,
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 of Georgia, Chamberlain, as far as the State
 of New York, in the St. John, see how
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 in the New York, Paris in the State, about
 1800 in the State of New York; there have
 been 1800. This, in the Medical Central
 people of all descriptions.

BRONCHOCELE.

AT Turin I had an ample opportunity of examining a subject, long in my contemplation, on which there have been various speculations and conjectures, among physicians, for many centuries. I mean the Alpine *Bronchocele*; or as it is called by the French, and in adjacent countries, the *Gouétre*, and by the Germans, the *Kropf*.

In the hospital *della Carita*, there was scarcely one female, from the age of four or five years, to the oldest woman, exempt from more, or less, of it.

Among the males there were some affected; but few, in comparison to the females.

Most of the womens' necks at Turin, particularly among the inferior classes of people, are enlarged. But here, as at *Chamberry*, because their windpipes are not so compressed as to impede the articulation of their words, and
their

their necks not fantastically knotted, like diseased trees with huge funguses,—they think they are exactly what they should be.

“*Quis tumidum guttur miratur in Alpibus — * ?*”

Physicians in general, have attributed these swellings to the rupture of the jugular vessels, from drinking snow, and ice-water; some, to obstructions, from the water being impregnated with mineral, selenetic, or other extraneous matter. The former has been the most commonly received notion, since the time of GALEN'S comment on the *gongrona* of HIPPOCRATES; which disorder, HIPPOCRATES says, is caused by excessive cold;—as snow, and ice †.

PLINY was of the latter opinion; and asserts that mankind, and swine only, are subject to this distemper ‡.

There are other curious opinions on this subject §.

It

* JUVENAL, Sat. XIII. v. 162.

† “*Frigidum valde venas frangit, & tussim citat, ut nix, glacies; & contrahit ut pherea & gongronæ. Simul causa duritiæ.*” Epidem. lib. vi. comment. 3. sect. 14.

‡ “*Guttur homini tantum, & suis intumescit aquarum quæ potantur plerumque vitio.*” Lib. ii. c. 78. Vide Lib. viii. c. 77.

§ “*Non ut plerisque visum est, ex immodicis clamoribus, aut ex potu aquæ ex liquefactis nivibus quæ in Alpibus aliisque montanis in usu est;*
sed

It is well known that the word *bronchocele* implies any swelling of the throat;—but there are so many swellings in this part, that the cause and treatment, of one bronchocele, must be very different from that of another.

The Alpine bronchocele is not the *gongrona* of HIPPOCRATES; nor the strumous, scrophulous, glandular tumour of the neck, of modern writers.

CELSUS has defined the disorder commonly received as the bronchocele, or wenn, better than any other writer*. But this is not the bronchocele of the Alps. The bronchocele of the Alps is, if I may so express it, a paralysis of the skin and tegamentous investment of the neck and throat, with the cellular membrane; in which, the phenomena, constituting the tumor, is inclosed.

There are various popular notions as to the cause of these swelled necks, in every country, where they are endemial. The common people at Inspruck, and other places in the Tyrol, believe they arise from a custom, universal in-

sed ex crassa lentaque pituita, quæ eo sensim è capite ejusque partibus externis per aures posteriora devolvitur. FERNELIUS, de Extern. Corp. Affect. Pathol. lib. vii. cap. 3.

* “*In cervice, inter cutem & asperam arteriam increfcit, Βρογχοκνην Græci vocant; quo modo cavo hebes, modo humor aliquis, melli aquæve similis includitur; interdum etiam ossibus pili immisti.*” Lib. vii. c. 13.

deed among them, in these mountainous countries, of carrying heavy loads on their heads. But how should this be the case, when this deformity appears in all ranks of people, from the cloistered nun, to the most exposed peasant? A physician at Inspruck, a friend of mine, and his daughter, a young woman of eighteen, have both of them swelled necks.

In ascending from Turin, to Mount Cenis, I saw many swelled necks; particularly at Rivoli, and between that place and Susa.

The people here, thus affected, are very pale; many of them foolish;—dwarfs, with large heads, and wild countenance:—like the late, perhaps the present, celebrated Roman beggar, BAIocco, a well-known personage to travellers.

In descending from Mount Cenis into Savoy, swelled necks are scarcely to be seen at the town of St. Michel. Yet at St. Julien, the next village, there is scarcely a woman whose neck is in a natural state.

If this bronchocele arose from melted snow, or vitiated water, these towns would be alike affected; the inhabitants of both, drink the same water;—that of the river *Arche*, which runs by all the towns and villages from the
foot

foot of Mount Cenis, and falls into the *Isere* near Montmelian.

At Hornberg, a town in the highest part of the mountains in the black forest in Germany, the women in general have considerably swelled necks; some of them prodigiously large, and deformed. The men have not. The young women's necks, though enlarged, are not seen to the enormous size of the more aged. I saw some *gouëtred* women here, with necks much larger, and more hideous, than the *monstrous craws*, which were some years ago shewn for money, in the Hay-market, in London. Yet Hornberg is the only town, in that part of the black forest, where I saw any necks in this state. But this is the case also continually in the Tyrol: in some villages it is hardly possible to find one woman without the *Kropf*, when in the next it is scarcely to be seen.

From the black forest, through Swabia, to the Tyrol, in the plains, the women are free from it; but they have bad teeth, which they never clean; and the peasantry are eaten up almost with worms.

I have remarked that the right side of the neck is generally more affected than the left; and that when the neck is not lumpy, and

irregularly swelled, or hanging down in flaps, or dew-laps, or protuding in knobs, the girls and women in general, in countries subject to this disorder, have preternaturally large necks, downwards, and tapering conically upwards, from the base, at the thorax; as if ascending, and spreading from about the thyroid gland.

From the preceding facts, it appears, that women are more subject to the bronchocele than men are: and that some towns are more invaded by it than others; though at the distance of a few miles only asunder.

It is not common in high situations among the Alps. It is chiefly confined to the inhabitants living in valleys, and on the sides of mountains; situations chosen for warmth, and which, in summer, are extremely hot, and in calms intensely so.

Though the inhabitants in the higher situations in the Alps are not subject to swelled necks, their appearance is peculiar to themselves. They look wild, have large foreheads, high cheeks, thin chaps, dark visages, and long beards; constituting an harsh, but vigorous countenance. This arises from the poverty of their living, and the severity of the climate repressing the softer parts of the flesh, and exhibiting the prominent parts of the skeleton.

That

That women are more subject to it than men are, arises, I believe, not simply from the delicacy of their habits, but from their necks and throats being exposed and open, from the manner of their dress, to the effects of the atmosphere.

That one town, or village, and not another, in the same vicinity, shall be affected by it, is occasioned, I believe, from the site, and aspect of such a town, or village; subjecting it to a current of wind loaded with frigid particles, descending from neighbouring or distant mountains capped with snow, upon the inhabitants, heated and sweating, in warm seasons of the year.

In a journey from Milan to Turin, in the middle of summer, in very hot weather, I have had my lips and face chapped, and my nails brittle,—in the same manner as is common in sharp frosts in England,—by the wind blowing from the North, from the adjacent Alps covered with snow, into the hot plains, where I was travelling.

Thus Inspruck must ever be subject to the *Kropf*. The town stands under a mountain that should defend it from the North; but it does not. The winds from that quarter are cutting and strong. The mountains to the

West are always covered with snow. The site, in summer, renders the town intolerably hot.

Moreover, I found that the popular diseases in these bronchocele situations, are principally anginas, and pleurifies,—and certainly from the same cause;—the sharp mountain winds rushing on people living in heat-reflecting stations, and chilling their throat and lungs, when their bodies are hot, and perspiring*. They are also much afflicted with red and diseased eyes, and dropfies.

If I have directed some light on the cause of bronchoceles, it is all I designed on this occasion. Much has been written concerning the treatment of strumous, and other glandular, scrophulous diseased tumours of the neck; but where the knife, or other means of extirpation, could not be applied, we read of nothing but a *dead man's hand*; *burnt sponge*; or the *royal touch*.

The Alpine bronchocele is not to be considered as a disease; though it sometimes proves so; by pressing on the wind-pipe, obstructing respiration, and causing suffocation.

As there is no possibility of removing the cause of these guttural affections, in Alpine countries, the best prevention is to guard the

* Derbyshire, Gloucestershire, and Shropshire, near the mountains, furnish many instances of swelled necks.

neck and throat with warm and defensible covering, when the wind blows from any quarter, where it must pass over frozen and snowy regions. Indeed, it is a fashion among the peasants in the Tyrol, particularly from Feufen to Trent, to wear large rolled-up black handkerchiefs about their necks; and when they are clean, and dressed in all their best apparel, as they are on Sundays, this sensible part of their clothing looks very becoming.

Great is the mischief in England, from neglect of warm clothing, every year, when East winds, fogs, and the most variable weather, prevail. In the last spring 1799, besides an unusual number of rheumatic, and paralytic cases, and apoplexies, I do not remember to have seen, in so short a space of time, so many pulmonic diseases, and rapid consumptions; all arising, in a great measure, from the same cause.

endanger my safety at Venice.—But he said, from what he had heard, he did not think it possible for me to survive the foul and pestilential air I had to encounter.

My design was to see the perfection,—the far-famed ultimatum of policy ;—the immured for life, in *solitary cells*.

The late Mr. *John Howard*, F. R. S. was at the prison when he was in Venice ; but he only heard something, and saw nothing, of this prison of prisons.

He had not bodily strength to bear the exertion required in such an undertaking. Neither do I believe he would have been suffered to enter them. It was with some difficulty that I obtained permission from the inquisitors ; which was granted me merely on account of my being an English physician ; a character much respected at that time in Venice. I wished to have seen the *Sotto Piombi*, where the state prisoners were kept ; but that was refused. Here, under the roof of the public buildings, they are confined ; exposed to the rigour of winter's cold, and summer's heat, and the vicissitudes of scorching days, and chilling nights.

PAUL RENIER was then Doge ; he, who married a Neapolitan dancer, when he was ambassador

ambassador at Constantinople; upon which account, according to the laws of Venice, his children were not *noble*; nor his wife qualified to appear at the great ceremonies of state; nor to preside at the entertainments given by him to the senate and nobility. He had been Doge nine years.

PAUL RENIER, thus circumstanced,—as it might happen to an English Lord Mayor, whose wife had not her planets so well posited as his Lordship, for acquitting herself in the vulgar tongue; or for drinking a bottle of wine, without an evil direction to her next neighbour,—was obliged to have his sister, or his niece, to perform the honours of his table.

Had PAUL RENIER married the daughter of an Apothecary and Druggist, or of a Glass Manufacturer, or of a Silk Manufacturer, his children would have been *noble*; and his wife the first female in rank in the state. It was chiefly by these three branches of business, that the winged Lion of St. Mark became so renowned in a magnificent, and once mighty empire.

I was conducted through the prison, with one of its inferior dependants. We had a torch with us. We crept along narrow passages, as dark as pitch. In some of them, two
people

people could scarcely pass each other. The cells are made of massy marble; the architecture, of the celebrated *Sanfovino*.

The cells are not only dark, and black as ink, but being surrounded, and confined with huge walls, the smallest breath of air can scarcely find circulation in them. They are about nine feet square, on the floor, arched at the top, and between six and seven feet high, in the highest part. There is to each cell a round hole, of eight inches diameter; through which the prisoner's daily allowance of twelve ounces of bread, and a pot of water, is delivered. There is a small iron door to the cell. The furniture of the cell is a little straw, and a small tub: nothing else. The straw is renewed, and the tub emptied, through the iron door, occasionally.

The diet is ingeniously contrived for the perduration of punishment. Animal food, or a cordial nutritious regimen, in such a situation, would bring on disease, and defeat the end of this Venetian justice.—Neither can the soul, if so inclined, steal away, wrapt up in slumbering delusion, or sink to rest; from the admonition of her sad existence, by the gaoler's daily return.

I saw

I saw one man, who had been in a cell thirty years; two, who had been twelve years; and several who had been eight, and nine years, in their respective cells.

By my taper's light I could discover the prisoners' horrid countenances. They were all naked. The man who had been there thirty years, in face and body, was covered with long hair. He had lost the arrangement of words, and order of language. When I spoke to him, he made an unintelligible noise; and expressed fear and surprize; and, like some wild animals in desarts, which have suffered by the treachery of the human race, or have an instinctive abhorrence of it,—he would have fled like lightning from me, if he could.

One, whose faculties were not so obliterated; who still recollected the difference between day and night; whose eyes and ears, though long closed with a silent blank, still languished to perform their natural functions, implored, in the most piercing manner, that I would prevail on the gaoler to murder him; or to give him some instrument to destroy himself. I told him I had no power to serve him in this request. He then entreated I would use my endeavours with the inquisitors to get him hanged;

hanged; or drowned in the *Canal' Orfano*. But even in this I could not serve him. Death was a favour I had not interest enough to procure for him.

This kindness of death, however, was, during my stay in Venice, granted to one man, who had been "from the chearful ways of man cut off," thirteen years.

Before he left his dungeon, I had some conversation with him; this was six days previous to his execution. His transport at the prospect of death was surprizing. He longed for the happy moment. No saint ever exhibited more fervour in anticipating the joys of a future state, than this man did at the thoughts of being released from life, during the four days mockery of his trial.

It is in the *Canal' Orfano*, where vessels from Turkey and the Levant perform quarantine. This place is the watery grave of many who have committed political, or personal offences against the state, or senate; and of many, who have committed no offences at all. They are carried out of the city in the middle of the night, tied up in a sack, with a large stone fastened to it, and thrown into the water. Fishermen are prohibited, on forfeiture of their lives, against fishing in this district. The
pretence

pretence is the plague. This is the secret history of people being lost in Venice.

The government, with age, grew feeble; was afraid of the discussion of legal process, and of public executions; and navigated this rotten *Bucentaur* of the Adriatic, by spies, prisons, assassination, and the *Canal Orfano*.

Mr. *Howard*, whom I before mentioned, whose leading passion was hunting after prisons, frequently saw no more than their anterior apartments; and sometimes only the outside of the buildings.

To reconcile the motives of this romantic person to a principle of benevolence, it is necessary to suppose he took into his consideration only the corporeal contingencies of man; and that he was an entire stranger to the operations of the mind.

He knew nothing of experimental SOLITARY IMPRISONMENT; nor of the uses made of that instrument, in those terrible governments,—where intellect, and reason, are a misfortune, instead of blessing; where men, whom the Almighty has most favoured, are most dreaded; where legal institutions are at war with nature; where the basis of political systems stand on the perversion of morals; and where the monstrous superstructure is supported by train-
ing

ing man, like a wild beast, to make him the curse and scourge of his fellow-creatures.

Roving about himself, unconstrained as the feathered inhabitants of the air, *Howard* little knew the agonising condition of the compulsive solitary cell.

Buried in the grave, alive, as a commutation for a momentary death, how vain is the empty philanthropy of words; or the goodness of the marble, or the shape of the sepulchre, in which “the beauty of the world, the paragon of animals,” lies distracted on the rack!

If there be an hell,—the idea of which a virtuous mind can be susceptible,—this is that hell; and some Italian devil was its inventor. Such a one, as he of that country, who, to accomplish the eternity of the perdition of his enemy, beguiled him to disclaim his faith, to save his life; then instantly stabbed him to the heart, to prevent his repentance.

What I now unfold, in regard to the prison in Venice, is known but to a few people. I have reason to believe, that no foreigner besides myself ever witnessed the scene I have related; the exploring which, nearly cost me my life.

The

The heat, and want of air in the passages among the cells, so oppressed my strength and respiration, that I could scarcely walk, or breathe, when I left the prison. Sweat ran through every pore of my body. My clothes were, to my coat sleeves, wet through. I staid too long there. I went to St. Mark's Place, as soon as I could; and, by the assistance of the trembling *Dominico*, waiting for my return, the blessed light of day, fresh air, and a few glasses of *Maraschino*, I was enabled to get to my lodgings at the *Scudo di Francia*, on the side of the Great Canal, near the Rialto; where I was, for several hours, extremely ill, and for several days much indisposed.

It is not my purpose here, to enquire whether the Venetian people were wicked, or the Venetian government wise; nor to settle the proportion of crimes and punishments, in such a state as Venice. An Englishman cannot.

But this *oculus Italiae*, this proud virgin city, the idol of so many admirers,—“this model of human prudence, whose perfect symmetry had in itself no cause of decay or dissolution* ; whose dominion was, to termi-

* HARRINGTON. HOWELL.

nate only with the world *,"—has deceived her prophets †.—Overwhelmed by a torrent of misfortunes, she is now no more.

Reflecting on the wonderful existence supported in the almost airless dungeons, or rather wells, in the prison of Venice, not only under the earth, but under the water also (for one of them actually lies under the canal which separates the Prison from the Public Buildings †) for so long a time, to my astonished faculties, toads living closed up in the center of solid rocks, and salamanders even in fires, did not appear incredible.

BACON, indeed, asserts, that air is an enemy to life. But this doctrine has ever been considered as chimerical.

* "*Venetice non nisi cum rerum natura, et mundi machina periturae.*"

THUANUS.

† JUNCTINE, in 1581, with more modesty, fixed the overthrow of Venice for the end of the next century. This renowned astrologer and astronomer settled the fate of this empire, taking the time when the first stone of the building of the city was laid; which was on the Rialto, where St. James's Church now stands, anno 421, 15th March, at noon. He decreed, "*Venetiarum Senatores domini sceptrum ministrabunt ad calcem usque Virginis partus 1880 anni, vel circiter.*" Vol. I. p. 816.

‡ The groans, and cries of people, have been heard at night, by passengers going up this canal in gondolas, under the *Ponte della Paglia*, by the prison.

He

He says, “ the exclusion of the air ambient, tendeth to length of life two ways ; first, for that the external air, next unto the native spirit, (howsoever the air may be said to animate the spirit of man, and conferreth not a little to health) doth most of all prey upon the juices of the body ; and hasten the deficcation thereof ; and therefore the exclusion of it, is effectual to length of life.

“ Leading the life in dens and caves, where the air receives not the sun-beams, may be effectual to long life. For the air of itself, doth not much towards the depredation of the body, unless it be stirred by heat.

“ Next to the life in caves, is the life on mountains ; for, as the beams of the sun do not penetrate into caves, so on the tops of mountains, being destitute of reflexion, they are of small force. But this is to be understood of mountains where the air is clear and pure.

“ And this kind of air, of caves, and mountains, of its own proper nature, is little or nothing predatory. But air, such as ours is, which is predatory through the heat of the sun, ought as much as possible to be excluded from the body *.”

* History of Life and Death.

BACON founded these opinions from the histories he had collected of the longevity of abstemious secluded monks, hermits, and anchorites ; men who wished to live for ever.— He was unacquainted with the truth of his theory, in solitary cells, for the extinction of humanity.

He was himself so organised, as to be strongly attached to life. He wanted “length of days ;”—and had no idea that it is within the scope of nature to wish, and yet to be unable, to die. To count the painful hours, with increase of misery, unless favoured by the visitation of idiotism, or insanity, and to languish for the arrival of the liberating hand of death.









