

## **Notes on some early references to tropical diseases / Charles Singer.**

### **Contributors**

Singer, Charles, 1876-1960.  
Royal College of Surgeons of England

### **Publication/Creation**

Liverpool : University Press, 1912.

### **Persistent URL**

<https://wellcomecollection.org/works/wxscgczw>

### **Provider**

Royal College of Surgeons

### **License and attribution**

This material has been provided by This material has been provided by The Royal College of Surgeons of England. The original may be consulted at The Royal College of Surgeons of England. where the originals may be consulted. Conditions of use: it is possible this item is protected by copyright and/or related rights. You are free to use this item in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s).



Wellcome Collection  
183 Euston Road  
London NW1 2BE UK  
T +44 (0)20 7611 8722  
E [library@wellcomecollection.org](mailto:library@wellcomecollection.org)  
<https://wellcomecollection.org>

*With the authors kind regards.*

LIVERPOOL SCHOOL  
OF TROPICAL  
MEDICINE □ □



## ANNALS

Edited by  
RONALD ROSS  
in collaboration  
with

J. W. W. STEPHENS  
R. NEWSTEAD  
J. L. TODD  
H. W. THOMAS  
ANTON BREINL  
H. B. FANTHAM

# Notes on Some Early References to Tropical Diseases

*20.*

CHARLES SINGER, M.A., M.D. (OXON.),  
M.R.C.P. (LOND.)

REPRINTED FROM THE  
ANNALS OF TROPICAL MEDICINE AND PARASITOLOGY  
VOL. VI, No. 1 B, MAY, 1912

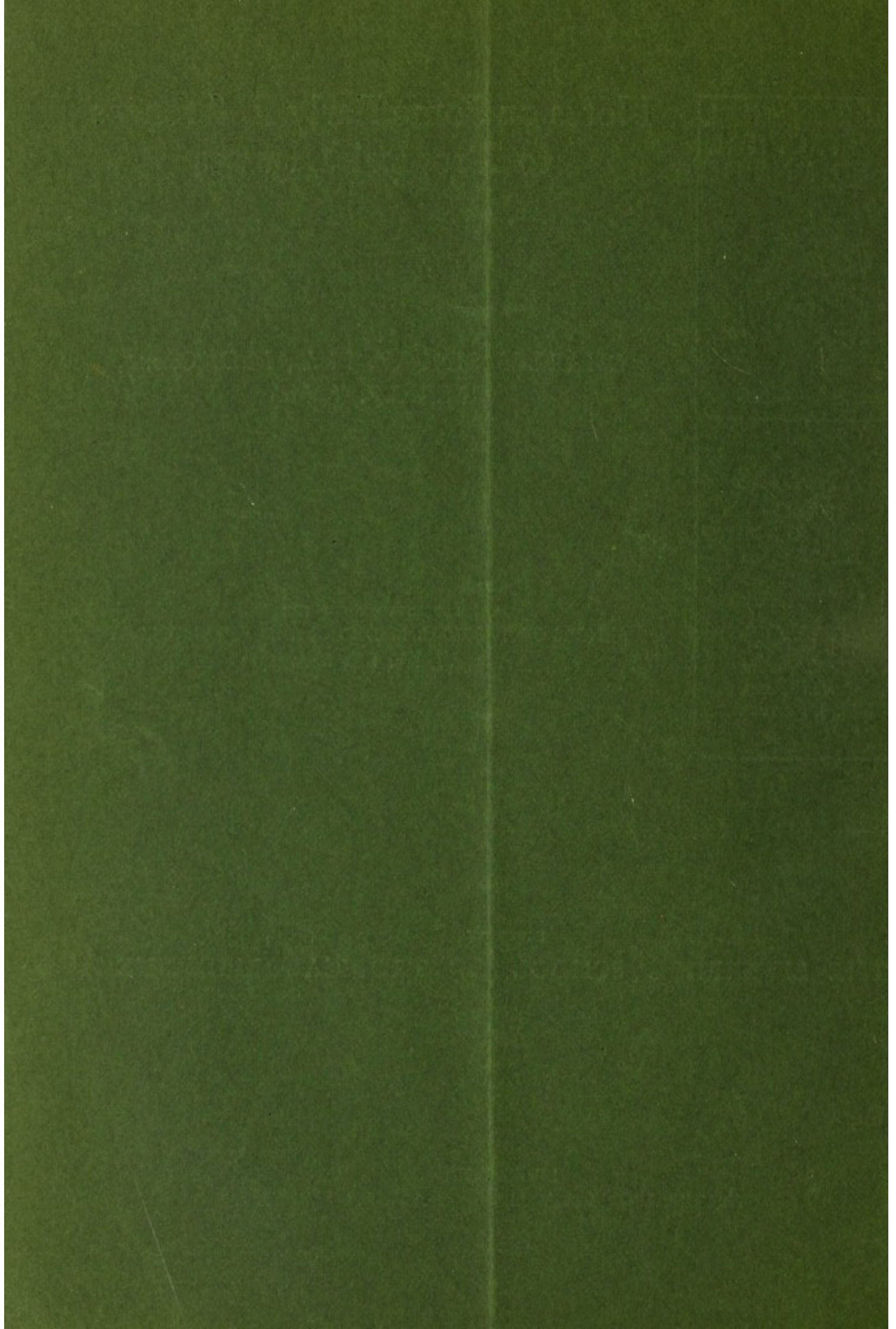


ISSUED BY

THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE

LIVERPOOL:  
AT THE UNIVERSITY PRESS, 57 ASHTON STREET







## NOTES ON SOME EARLY REFERENCES TO TROPICAL DISEASES

BY

CHARLES SINGER, M.A., M.D. (OXON.), M.R.C.P. (LOND.),

ASSISTANT PHYSICIAN TO THE SEAMEN'S HOSPITAL (DREADNOUGHT), LONDON,  
REGISTRAR TO THE RESEARCH INSTITUTE, CANCER HOSPITAL, LONDON.

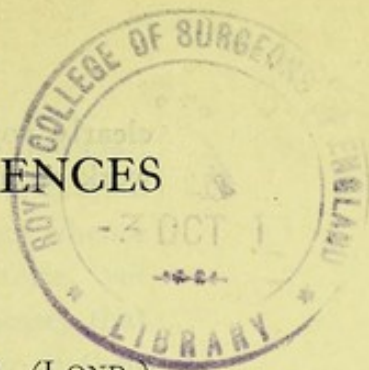
(Received for publication 19 March, 1912)

### I. AN ELIZABETHAN HANDBOOK OF TROPICAL MEDICINE

The kinship of letters and national enterprise has never been more happily illustrated than in the closing years of Queen Elizabeth's reign. The world, grown more spacious, was daily yielding fresh material for the noble writers whose works form our inexhaustible national treasury. Within ten years around the turn of the sixteenth century there was a series of nautical adventures in close association with literary productions, showing that if the seaman exercised a moulding force on literature, literature in its turn was not without its influence on seacraft.

With all this interest in oversea attempts, attention was bound to turn to the *professional* needs of sailors, and a large literature intended for the use of seamen rapidly arose. These works have a literary as well as a scientific value and among them books on medicine adapted to the especial needs of sailors would naturally take a place (Note 1). New and strange lands yielded diseases equally new and strange, and we may therefore look to this period for the small beginnings of the special study of tropical medicine in this country. The little work which we here discuss has some pioneer claim in this regard, while it contributes an addition to the English medical works of literary merit.

In 1598 there appeared in London a small pamphlet of 25 pages by one G. W., printed by F(elix) K(ingston) for H(umphrey) L(ownes). The author has entitled his work 'The Cures of the Diseased in Remote Regions, Preventing *Mortalitie*, incident in Forraine Attempts of the *English Nation*,' the 'Attempts' being





clearly voyages to Tropical America. This is perhaps the earliest work on medicine intended for sailors published in Great Britain.

# THE CVRES OF the Diseased, in remote *Regions.*

PREVENTING MORTALITY.  
ie, incident in Forraigne Attempts,  
of the *English* Nation.

*La honra mas vale,  
merecerla que tenerla.*



*At London*  
Printed by F.K. for H. L.  
1598.

*Photo by Donald Macbeth, London*

G. W. was a layman in physic, and relates, in a note to the reader, that 'the cause that induceth mee publiquelie to expresse

the Cure of Diseases of such consequence ([which] every judiciall conceite may perceive to have been the only prejudice to our Nation in the expeditions of our time to the Southerne parts: from whence they . . . . . have returned with renowned victorie, yet exceedinglie opprest withe extreame and penurious sicknesse, that hathe much more prevented the proceeding and performing of their pretensions than the power of Enemies) is not that I purpose, practitioner-like in Phisicke or Chirurgie, to assume unto me anie knowledge in those Sciences and Faculties: But to possesse all men of remedies for such infirmities, as in my owne experience, have infinitelie impaired *English* Forces in intemperate Clymates, which I publish, for the good of those whom cause may compell to have use thereof, and would be so censured of all.'

The author had voyaged principally to the Spanish Main, and was captured by the enemies of his country. In his dedication '*To the Queenes most Excellent Majestie*' he writes of himself that 'in my unjust imprisonment in Spayne, it pleased God to afflict me with the *Tabardilla* Pestilence: whereof being in cure, by an especiall Phisition of the King, I observed his Methode for the same, and such other Diseases as have perished Your Maiesties people in the Southerne parts, Which Remedies have since, by my direction, taken the like good effects.'

The most pleasing feature of the little book is the verse with which our author opens and concludes his theme. The lines are here given in full.

#### THE WRITER'S INTENT

Man that is borne, not for himself is borne,  
 But for his Prince, his Countrie, and his friends.  
 To helpe the sicke, distressed and forlorne,  
 Are works of Mercie, Man to man extends.  
 Who hath the power, and meanes, and will not cherish,  
 Shall with the Hider of his Tallent perish.

Transgression first did sinne in man beget,  
 Sinne, sickness, death, and mischiefes many more:  
 For as men's mindes on wickednes were set,  
 So plagues increast, which were not knowne before.  
 But God, whose mercie, iustice doth exceed,  
 Sends helps for hurts, and salves for sore at need.



## CONCLUSION

Let no man boast of beautie, strength, or youth :

For, like to flowres we bud, we spread, we fade :

Nothing is certaine, but the certaine truth,

To-day a man, to-morrow but a shade.

His last apparell, cut out with a spade,

Of nature's coarsest stuffe (I meane) her molde,

Must shroud the corps, that living shone in golde.



TO THE QUEENES  
MOST EXCELLENT  
MAIESTIE.

**S**Acresd Soueraigne,  
in my iniust impri-  
sonment in Spayne,  
it pleased God to af-  
flict me with the Ta-  
bardilla Pestilence : whereof being  
incure, by an especiall Phisition of  
that King, I obserued his methode  
for the same, and such other Disea-  
ses, as haue perished your Maie-  
sties people in the Southerne parts.  
Which Remedies haue since, by my  
direction, taken the like good effects.  
A 3 And



Even in his Index the writer bursts forth into verse, and the book is prefixed by the following table:—

#### THE BOOKE'S CONTENT

The burning fever, calde the *Calenture*,  
 The aking *Tabardilla* pestilent,  
 Th' *Espinlas* prickings which men do endure,  
*Cameras de Sangre*, Fluxes violent,  
 Th' *Erizipila*, swelling the Pacient,  
 The *Tiñoso*, which we the Scurvey call,  
 Are truly here describ'd, and cured all.

English seamen of the period had learned much of their craft from the Spaniards, and G. W., like many contemporary writers on nautical subjects, uses Spanish words and quotes Spanish proverbs freely. A few extracts from the pamphlet are here appended, with identification and descriptions of the diseases with which it deals.

By the *Calenture* is probably meant the conditions now classed as heat-stroke or sunstroke. The word, which in Spanish means simply a heat or fever, was introduced into England from Spain about 1590. The *Calenture* was considered to be especially a disease of sailors in the Tropics, and by the popular fancy it was associated with a delirium in which the patient imagined the sea to be a green field and desired to jump into it. Cases are even recorded where the disease is said to have seized upon whole crews (Note 2).

Shakespeare, in his famous description of the *facies Hippocratica* in the death of Falstaff, was perhaps thinking of this condition. 'After I saw him fumble with the sheets and play with flowers and smile upon his finger ends, I knew there was but one way, for his nose was sharp as a pen, and 'a babbled of green fields.' (Henry V, Act II, Scene III.) This passage was first printed in 1598, and must have been written about the same date as our pamphlet. (The text is here given with the well-known emendation of Theobald.)

'The *Calenture*,' says one author, 'is the most usuall Disease, happening to our Nation in intemperate climats by inflammation of Blood and often proceeding of immoderate drinking of wine.' The treatment suggested would appear by no means irrational, even nowadays, for some types of the disease. 'So soone as the Pacient



is perceived to be possest of the Calenture, except the Chirurgion defer it for danger of the signe . . . . open the Median veine of the right arme, and take such quantitie of blood, as agree the to the abilitie of the bodie, which not asswaging the heate by the next day; to open the same veine in the left arme, and take so much more blood at his like discretion. And the bodie being Costive (for so commonly the Pacients are) to give him some meete Purgation; and not to permit him to drinke other than water coolde, wherein Barley and Anniseedes have been sodden with bruised Licorice . . . . And not to suffer the Pacient to drinke, seven dayes after he is perfectlie recovered, any other drinke, than such water.'

*Tabardilla* is Spanish for a 'burning fever,' but, unlike the Calenture, the word did not become naturalized in England. Under the term *Tabardilla*, our author is apparently describing cases of yellow fever, together with others of a haemorrhagic form of bilious remittent malarial fever, and, perhaps, some cases of Dengue. 'The Disease,' he says, 'is so exceedingly pestilent and infectious, as by the same whole kingdomes in both the Indias have been depopulated.'

He describes an initial headache, jaundice, and vigil which would well apply to yellow fever, where, however, the purpuric rash is a rare phenomenon. 'The *Tabardilla*,' he tells us, 'first assaults the Pacient very vehemently with pain in the head and backe, and the bodie seeming yellow, is some signe thereof, and within twenty-four howres it is so tortuous that he that is possest thereof cannot sleep or rest, turning himself on either side, back and bellie; and burning in the backe most extremely. And when it growes to perfection, there will appeare red and blew spots upon the pacient's brest and wrists.'

The treatment for the *Tabardilla* is purgation and phlebotomy, the patient is to drink water only, 'and to bee carefull of his diet: for if this *Tabardilla*, which we call here in England God's Tokens, come again unto the Pacient he can hardly escape it. And it is no lesse infectious than the usual English Plague.'

The symptoms and character of the plague and its 'tokens,' as the associated rash was called, would have been well remembered by the author, for in 1592 there occurred one of the worst outbreaks



of this epidemic recorded in London. The disease lingered there until the end of the century, and made necessary wide circulation by the Government of a leaflet, entitled 'An advise set doune upon her maiesties expresse commandement by the best learned in Physicke . . . . for the preservation of her Good Subjects from the plague.' Although G. W. treats the infectious nature of plague as assured, the discussion of this barren topic occupied a large field in medical literature for another two hundred and fifty years (Note 3).

The *Espinlas* we are unable to identify. We therefore give the author's description of it in his own words.

'The *Espinlas* is a very strange sicknes, and usual in those parts, to such as take cold in their breasts, after great heat or travell. And most times it comes to those that lye with their breasts upon the ground especially in the night.

#### 'TO KNOW THE *Espinlas*.

'The partie having the *Espinlas* will be giddie in the head and have pain and pricking at his breast, as with many thorns; wherefore I thinke it is so called of Spina and Espina, the Latine and Spanish words for a Thorne. And there will be upon the Huesso radio [Anglicé—radial bone], or Focell, being the upper part of his arme, a hand breadth above the wrist, a little kernell by which it is certainly knowne. And he that hath this Disease will not have appetite to meate or drinke; nor cannot digest meate, although he bee procured to take it.

#### 'TO CURE THE *Espinlas*.

'The *Espinlas*, appearing by the former signes: Take Olive oyle presently, and therewith chafe the Kernel upon the Patients arme, using so to do twice every day until it be dissolved: and laying Oyle likewise upon his breast, stroke it upward somewhat hard with the hand: then spread fine flax upon it and the kernell, making it fast with a rowler: and within two or three days the diseased thereof will be recovered. Whereas els it is very dangerous to deprive them of life.'

By '*Cameras de Sangre*, which is the Bloodie Flux,' forms of



Tropical Dysentery are clearly indicated. 'The Pacients,' we are told, 'often die suddenly without feeling much grieffe . . . . They must be thoroughly purged of the sliminess engendered in the passages . . . . Give to purge him in the morning halfe a pint of White Wine coold, wherein  $\frac{1}{2}$  ounce of Rubarb hath been sodden,' and for diet 'if it be on Land, the livers of Goates (especiallie), Sheepe, or Bullocks roasted: . . . . And if at Sea, Rice, only sodden in water . . . . until the infirmitie is perfectly asswaged.'

The word *Erysipelas* is as old as medicine itself, and although the *disease* was described by the father of medicine, the *term* acquired an exact significance only in modern times. Our author, however, under the heading 'Erizipila,' gives a good description of the disease in its modern connotation. 'He that hath the *Erizipila*, will bee swolne in the face, or some part of him, and it will be of yellow colour mixt with red. And when it is thrust with the finger, there will remaine a signe or dent of the same; and then by degrees it will fill againe to the former proportion. And it speedily infecteth the inwarde parts, because such swellings come sooner to perfection in hot places than in temperate Countries. And therefore the diseased thereof, must bee immediatlie provided of remedie.'

The treatment of Erysipelas is interesting. 'Some savage people have first found perfectly to cure this *Erizipila*, . . . . by brusing so much *tobaco*, as will yeeld spoonfuls of juyce and to drinke it presently after they are infected therewith. And to launce the places swolne; thereunto putting *Casada* wet (Note 4), and made in paste. Continuing in colde places and shadie, neere Rivers: and not to travell or labour, until they are recovered. But the Spanyards in India, . . . . set so many *Ventoses* (Note 5) upon the swolne places as they can containe, scarrifying them, and drawing out the corrupted Humour so congealed.'

'*The Tiñoso, or Scurvy*,' is described as 'an infecting Disease, sufficientlie known unto Seafaring men: who by putrified meates, & corrupted drinkes, eating Bisket flowrie, or foule crusted, wearing wet apparell . . . . and slothfull demeanour . . . . obtaine the same.' The disease, our author says, is 'so ordinary at Sea, as it hath seldomẽ seen, any Ship or Pinnice, to be foure moneths upon



any Voyage . . . . but some of the Companie have had this Disease.' He knows well its symptoms, including the joint lesions, the rashes, and the swollen gums. Exercise, he considers, is very necessary to avert the Scurvy—an important point in those days when the Atlantic was crossed in tiny ships,—and 'also it is a certaine and assured medicine against this Disease, to have such quantitie of Beere, brewed with Graynes & Long pepper, as in the morning twice everie weeke there may be given a good draught to a man . . . . But White Wine or Syder, boyled and brewed with Graynes & Long peper, in like quantitie is very singular good. And it is not fit to suffer the gums to abound with flesh: and therefore sometimes let them bleede, & cleere them withe strong Vinegar,' nor should the patients 'be suffered to eat any salt meates, if other may be had.'

## II. A NOTE ON AN EARLY RECORD OF SLEEPING SICKNESS IN WEST AFRICA

The earliest mention of the Sleeping Sickness is usually considered to be in Winterbottom's 'Account of the Native Africans in the neighbourhood of Sierra Leone,' published in 1803 (Note 6). In 1734, however, on his return from a voyage to West Africa, John Atkins, a Naval Surgeon, gave a clear description of cases of the disease on the Guinea Coast. As Atkin's journey had been made in the year 1721, the observation must be referred to that date.

His description is to be found in the Appendix to his little volume 'The Navy Surgeon,' and runs as follows:—'The *Sleepy Distemper* (common among the Negroes) gives no other previous Notice, than a want of Appetite two or three days before; their sleeps are sound, and Sense & Feeling very little; for pulling drubbing or whipping will scarce stir up Sense and Power enough to move; and the Moment you cease beating the smart is forgot, and down they fall again into a state of Insensibility, drivling constantly from the Mouth as if in deep salivation; breathe slowly, but not unequally nor snort.

'Young People are more subject to it than the old; and the Judgment generally pronounced is Death, the Prognostick seldom failing. If now and then one of them recovers, he certainly loses the little Reason he had, and turns Ideot. . . .



'In Searching for the Cause of this Distemper it will be necessary to repeat what I have observed, that the Bulk of Slave-Cargoes mostly consist of Country People, as distinguished from the Coast people, apparent if the principal Way of Supply be considered. At Whydah more Slaves are bought than on the whole Coast besides: & Why? The King of that Country, and his next neighbours, understand sovereignty better than others, and often make War (as they call it), to bring in whole villages of those more simple Creatures inland, to be sold at Market, and exchanged for the Tempting Commodities of *Europe*, that they are fond and mad after.

'The immediate cause of this deadly Sleepiness in the Slaves is evidently a Super-abundance of Phlegm or Serum, extravasated in the Brain, which obstructs the Irradiation of the Nerves; but what the procatartick Causes are, that exert to this Production, eclipsing the Light of the Senses, is not so easily assigned. . . .

'The cure is attempted by whatever rouses the Spirits; bleeding in the jugular, quick purges, Sternatories, Vesicatories, Acupuncture, Seton, Fontanels, and Sudden Plunges into the Sea; the latter is most effectual when the Distemper is new, and the Patient as yet not attended with a drivling at Mouth and Nose.'

John Atkins lived from 1685 to 1757. A short account of his career, mostly from his works, is given by Dr. Norman Moore in the Dictionary of National Biography. Atkins was a good observer, and a man of some learning and independent character, indeed too independent for success in the service he had chosen, for disputes and criticisms of his brother officers led to his failure to find re-employment in the Navy after his return from Africa. Little else is known of his life, nor have his published works attracted any considerable attention (Note 7).

### III. AN EARLY ACCOUNT OF THE SAND-FLEA, *PULEX PENETRANS*

Some of the earliest settlers in the New World have left accounts of how their earthly sojourn was made burdensome by the ravages of the little sand-flea or chigoe. The first printed record is, perhaps, that of the Spanish writer Fernandez de Oviedo, who in 1547 mentions the insect in the West Indies (Note 8).



In 1558 there was published in Paris a book with the curious title 'Les Singularitez de la France Antartique, Autrement nommée Amerique (sic!): et de plusieurs Terres & Isles decouvertes de

LES  
SINGVLARI-  
TEZ DE LA FRAN-  
CE ANTARCTIQUE, AV-  
trement nommée Amerique:& de  
plusieurs Terres & Isles de-  
couvertes de nostre  
temps.

*Par F. André Theuet, natif d'Angoulesme.*



A PARIS,  
Chez les heritiers de Maurice de la Porte, au Clos  
Bruneau, à l'enseigne S. Claude.  
1558.

AVEC PRIVILEGE DV ROY.

*Photo by Donald Macbeth, London*

nostre temps, Par. F. André Theuet, natif d'Angoulesme.' The book was translated into English ten years later, and published in



London in black letter type as 'The new found worlde, or Antarticke, wherein is contained wonderful and strange things, as well of humaine creatures, as Beastes, Fishes, Foules, and Serpents, Trees, Plants, Pines of Gold, etc., etc. . . . .

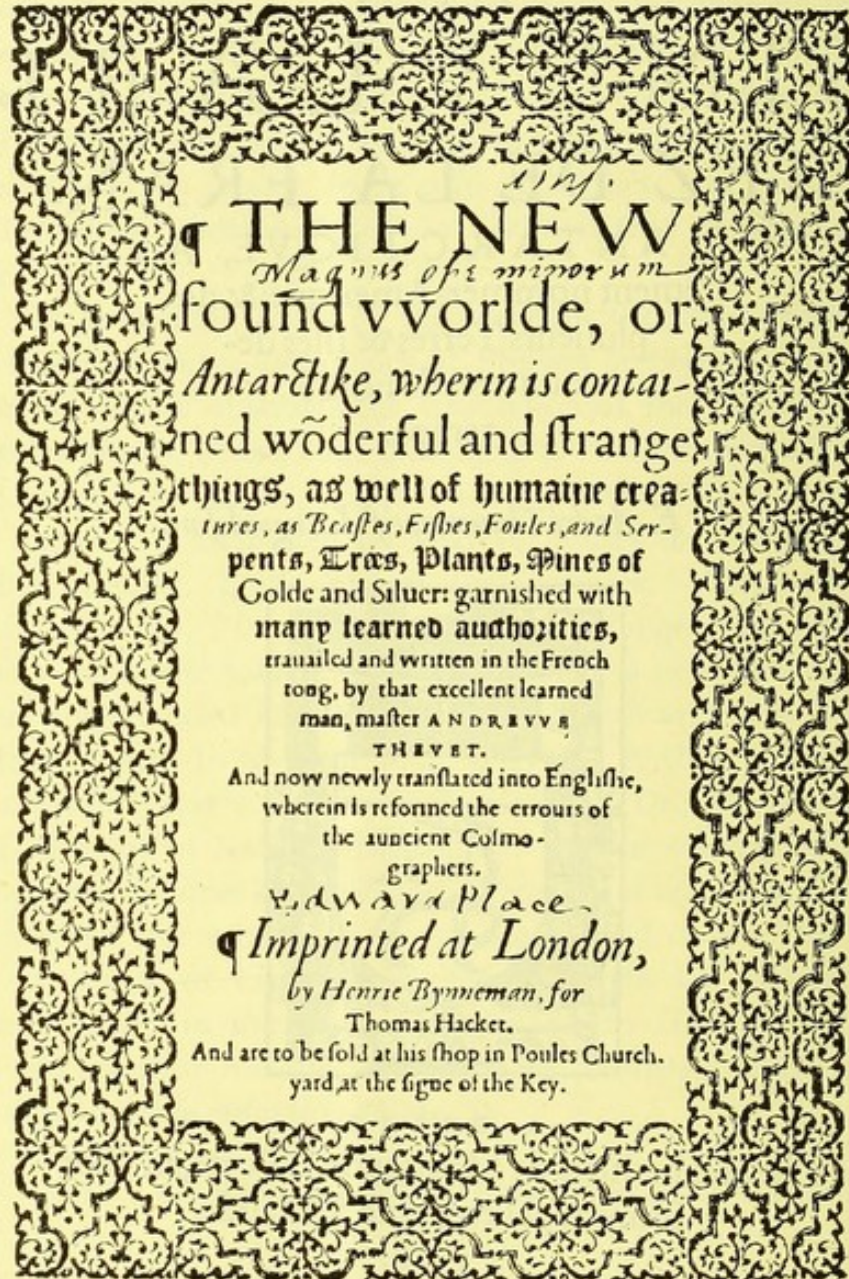


Photo by Donald Macbeth, London

travailed and written in the French tong by that excellent, learned man, Master Andrewe Thevet, and now newly translated into Englishe. . . . .



The following quotation, referring to the sand-flea, is made from the English translation, with a few corrections and additions from the original French where necessary:—

'I will not forget, that among their diseases they have one marvellous indisposition, which commeth by little wormes that enter into their feete, named in their language *TOM*, that are little ones [French 'lesquels ne sont gueres plus gros que cirons'—are scarcely bigger than acari (Note *q*)] and I thinke that they ingender in their feet: for there will be sometimes such a number in one place that they will rayse a knob as big as a beane, with doloure and paine in that place, the which paine also chaunced to us, for being there, our feete and our handes were covered with little clothes [French 'bosettes' = bumps], in which when they were broken, was onely one white worme with filthe. And for to shunne this grieve, the wilde men make a certain oyle of a fruite named *Hibonconhu*, like unto a date, the which is not good to eate; they preserve it in little vessels of fruites, named in their language *Caramenio*, and therewith they rub the places that are grieved, a thing very necessary [French 'propre' = suitable] as they doe affirme against these wormes.

'Also sometimes they anoint therewith all their bodies when they are weary. Besides this the oyle is proper for woundes and sores, as they have knowne by experience.'

The word *Hiboconhu* used here is probably the equivalent of *Ipecacuanha*, under which title were, and still are, known a considerable number of plants of Brazil and other parts of the New World. *Hiboconhu* is not, however, the *Ipecacuanha* of our official Pharmacopoeia, the fruit of which bears no resemblance to a date. The drug *Ipecacuanha* itself did not reach Europe until the latter part of the seventeenth century.

André Theuet, the author of this work, lived from 1502 to 1590. He was a man of humble birth, who entered upon theological studies, but became indiscriminate in his wide reading. He was known in his day for his vast memory and for his restless and wandering habits. He travelled both in the Orient and in the New World, and wrote very credulous accounts of his journeys. Returning to France, he took orders and spent the declining years of his life in literary work.



NOTE 1. The relationship of literature and seacraft of this period, the reader will find interestingly discussed by Commander C. N. Robinson and Mr. John Leyland in Vol. IV of the 'Cambridge History of English Literature,' and by Sir Clements Markham in his 'Life of John Davis,' London, 1889.

NOTE 2. Those bitten by the Tarantula were supposed to be similarly affected by a desire to jump into the sea (*vide* Athanasius Kircher's 'Magnes sive de Arte Magnetica Opus,' Rome, 1641, p. 870), as were also, at times, the St. Vitus' dancers of the Middle Ages.

NOTE 3. Haeser, in his 'Historisch-pathologische Untersuchungen,' Dresden, 1841, part 2, p. 26, identifies the Tabardilla with Typhus. He considers, on the authority of the three writers, Vallesius, Toreus, and Coyttarus, that there was an epidemic of this disease in Spain in 1557. This disease can, however, scarcely be the one described by our author under the name Tabardilla, the symptoms of which hardly fit in with those of Typhus.

NOTE 4. By 'Casada' is doubtless meant Cassava or Mandioc, a plant extensively cultivated in the West Indies and in Tropical America. The fleshy, tuberous roots are used as food, and from them Tapioca is obtained. A cold compress could be made from them.

NOTE 5. Ventose: an obsolete word for a cupping glass.

NOTE 6. The first detailed account of the disease was probably that of Clarke in the 'London Medical Gazette,' September, 1840, p. 970, and later in the 'Edinburgh Monthly Journal of Medicine,' April, 1842, p. 32, and the 'Trans. of the Epidemiological Society,' I, 116.

NOTE 7. The publications of John Atkins are as follows:—

(1) 'The Navy Surgeon,' with the Appendix quoted above, London, 1734. 2nd Edition, London, 1737.

(2) 'A Voyage to Guinea, Brasil, and the West Indies; in His Majesty's Ships, the Swallow and Weymouth,' London, 1735. An account of this voyage is abstracted in Moore's 'Collection of Voyages and Travel,' London, no date (? 1740), and in 'A Collection of Voyages and Travels,' published in London anonymously in 1745. Some attention is given to these writings of Atkins in the 'Allgemeine Historie der Reisen' of J. J. Schwabe, Leipsig, 1748.



(3) 'A Treatise on . . . . Chirurgical Subjects,' London, 1736 (?). This volume contains some chapters of (1) re-printed, and among them the passages on 'the sleepy distemper.'

NOTE 8. Oviedo, 'Cronica de las Indias' 1547, fol. XXI, gives the animal the name of 'nigua.'

NOTE 9. The word 'ciron,' which I have here translated 'Acarus,' is a term which is of doubtful meaning in any work which appeared before the microscope came into use. The little *Acarus scabiei*, being on the limits of unaided vision, is in early writings repeatedly confused with the *Pediculus*, and although Saint Hildegard in the twelfth century, Guy de Chauliac in the fourteenth century, and Paracelsus in the succeeding century, had all definitely referred to the *acarus*, it is usually difficult to be sure of the identity of the organism, even in the works of these writers. In the present context, however, the reference to the *burrowing* habits of the chigoe, and the statement that it is scarcely larger than the 'ciron,' makes the translation 'acarus' a fairly safe one.

*Addendum.* Since writing the above the writer's attention has been drawn to a reference to Atkins' work by Dr. E. D. Whittle in the 'Malay Medical Journal' for April, 1911, and in the Bulletin of the Sleeping Sickness Bureau, for August, 1911, p. 329.







## NOTES ON SOME EARLY REFERENCES TO TROPICAL DISEASES\*

BY

CHARLES SINGER, M.A., M.D. (OXON.), M.R.C.P. (LOND.).

ASSISTANT PHYSICIAN TO THE SEAMEN'S HOSPITAL (DREADNOUGHT) LONDON,  
REGISTRAR TO THE RESEARCH INSTITUTE, CANCER HOSPITAL, LONDON.

(Received for publication 15 August, 1912)

### PLATE XXII

#### IV. ANDRÉ THEVET ON THE IDENTITY OF YAWS AND SYPHILIS—1558

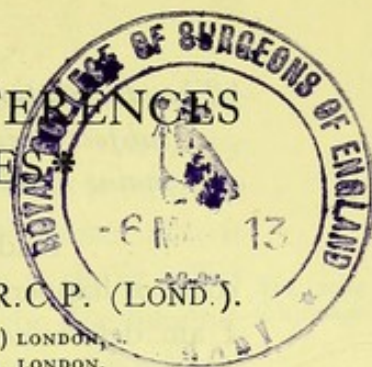
In the case of yaws, as with several other American diseases, we owe our first accounts to the Spanish chroniclers, and notably to Fernandez de Oviedo (Note 1). These first descriptions are, however, scanty, and for clearer statements we must turn to somewhat later authorities. Among these writers a place may be accorded to André Thevet. We have in a previous issue (Note 2) described Thevet's work, 'La France Antarctique,' in which he gives considerable attention to medical matters. It is of interest that in the account of yaws, or 'Pians' as he calls it, this disease is compared to the syphilis then spreading over Europe. Framboesia is still known in the French Antilles as 'Pians,' which is said to be a native term meaning a 'strawberry.' Although Oviedo calls it 'Bubas,' the designation 'Pians' is found in many sixteenth and seventeenth century writers, but the earliest use of the word known to us is in the pages of Thevet.

Thevet's book was published in Paris in 1558, and is a fine piece of printing of the best period of French typography. We have endeavoured in what follows to preserve something of the quaintness of the original by quoting from the anonymous English translation of 1568, making only such corrections as are necessary to preserve the sense.

NOTE 1.—Oviedo first landed in America in 1514, but his books, 'Natural Hystoria de las Indias,' Toledo, and 'Coronica de las Indias,' Madrid, did not appear until 1526 and 1547 respectively.

NOTE 2.—Annals of Tropical Medicine, Vol. VI., p. 96.

\* Continued from Annals Trop. Med. and Parasit., VI, (1912), pp. 87-101.





*'The description of a sicknesse named Pians, to the which are subject these people of America as well in the Ilandes as the maine land. (Note 3.)*

Pians a  
sicknesse in  
America and  
his originall.

The wildmen  
are very  
lecherous and  
carnall.

The true  
originall of the  
French pocks  
as the Frenche  
men write

'. . . And for that all diseases (as oure Phisitians shew us) come or happen either of the aire, or of the manner of men's living, I am determind to write and set out here a sicknesse or disease very rife and common in these countreys of America and of the West, discovered in our time. Now this sicknesse named Pians by the people of the countrey, cometh not of the corruption of the aire, for it is there verie good and temperat, which [is shewn] by experience [of] the fruites that the earth bringeth forth, with the benefits of the aire, without ye which nothing is made, bee it of Nature or artificiall. Also that the sycknesse [which proceedeth] of the corruption of the ayre, doth hurt as well the young as the olde, the ryche as well as the poore notwithstanding the internall or inwarde disposition (Note 4). Therefore it muste needes bee, that [Pians] proceedeth of some misgovernement, as to much carnall and fleshely frequentation the man with the woman, considering that thys people is very lecherous, carnal and more than brutishe, specially the women: for they do seeke and practise all the meanes to move man to lust. *This sicknesse is no other thyng than the pocks that raigneth and hath power over all Europe, specially among the Frenchemen: For of us it is named the Frenche pockes, the whyche disease as the Frenchmen wright, was first taken at a voyage into Naples, and thether it was broughte by the Spanyardes, from the West Indies. For before it was discovered and made subiecte to the Spanyardes there was no mention thereof. It is not onely here in Europe, but also in Grecia, in Asia and in Affrica.*

'Well, let us returne unto the wylde men's evyll and to the

NOTE 3.—From chapter 48, p. 70, of Thevet's 'France Antarctique.' Words and passages not in the original English translation are placed in square brackets.

NOTE 4.—From the days of Hippocrates to the seventeenth century, and even down to our own times, epidemic and infectious diseases have been regarded as due to some change or corruption of the air. Thus, in Shakespeare's 'Winter's Tale,' Act v, Scene 1, Leontes says:

'The blessed gods  
Purge all infection from our air whilst you  
Do climate here!'

It is true that Fracastor (De Contagionibus, Venice 1546), made a great advance by his conception of the 'seeds' (semina) of disease, but in spite of his influence and although his phrases were freely quoted, his idea found no fruitful soil until the middle of the succeeding century. The writer hopes to discuss this point in a forthcoming work.



remedies that they doe use therefore. Nowe this evill taketh the parties, as well wilde men as Christians that are there, by contagion [or] touching, even as the pockes dothe. Also it hath the like Symptomes, and it is daungerous, that if it be waxen old, it is harde (and daungerous) to heale: for sometimes it dothe afflict them even to the death. As for the Christians, whiche doe inhabite in the lande of America, if they couple themselves with the women, they shall never [escape infection], but shall fall into the daunger thereof muche more sooner than they of the countrey. For the curing of this disease, likewise for a certain alteration that oftentimes cometh wyth this evill, they make a certaine decoction of the barke of a tree, named in their language *Hiourahe*, of the which they drinke, more easier to cure than with our medicine, and they are more easier to be healed than others to my judgement, for their temperatenesse and complection, which are not broken out with infections, as [ours] are.'

The curing of  
this disease.

Hiourahe  
a tree.

The passage here given in italics is an amusing mis-translation. It forms an incident of that game of battledore and shuttlecock played by writers throughout the sixteenth century, in which the charge of originating the venereal plague was made in turn against each western nation and in due course rebutted on to a neighbouring nation. The final responsibility has been left with the poor Indian inhabitant of the Western Isles, whose exclusion from the republic of letters has prevented his views from reaching us.

A just translation of the indignant Thevet's actual words in the italicized paragraph would run as follows: 'Which also makes me think and say that this disease is probably no other than that beautiful pox now so rife in Europe which has falsely been fastened on the French nation. By the way that foreigners have labelled it as the *French disease* one might think that none but Frenchmen suffered from it. We all know how it flourishes in France, but so it does elsewhere. It took rise first in an expedition against Naples whither some Spaniards from the Western Isles [i.e., the West Indies] had carried it. Before these islands were discovered and conquered by the Spanish there was no mention made of it either in this country or in Greece or in any part of Asia or Africa. I have myself often talked this matter over with



the late Monsieur Sylvius (Note 5), one of the most learned doctors of our age. To my judgment it would be more in keeping with the facts and more rational to call it the Spanish disease, having regard to the country of its origin.'

There are a number of points in this account to which we would draw the reader's attention.

(1) Thevet straightway identifies pians with syphilis. This was commonly the case with early writers, and the discovery of a form of spirochaete in both diseases goes some way toward justifying our unscientific forebears. Framboesia as it presents itself to the modern observer is not, we suppose, very frequently confused with syphilis, though to judge from the earlier accounts, the disease, like many others, has perhaps changed its type.

(2) 'The pockes . . . taken at a voyage into Naples . . . and thether brought by the Spanyardes from the West Indies,' refers to the terrible outbreak which burst upon Italy in 1493-4. The syphilis, not then exclusively a venereal disease, or at least not regarded as such, spread with terrible rapidity throughout Europe, and left perhaps a deeper impression on medical literature than any event in the world's history.

The work of Fracastor (Note 6), the inventor of the term syphilis, and one of the earliest scientific writers on the subject, leaves open the question whether or no the disease was brought from the New World. Fracastor's composition is in the form of an allegorical poem, which tells how a shepherd, Siphilus by name, blasphemed against the Sun god, who in anger smote him down with the disease. Perhaps into this reference to the Sun god we may read a belief that the disease was of tropical origin. The balance of opinion among syphilographers on this difficult point is still that the disease was indeed brought from tropical America in 1493 by Columbus. In the absence, however, of human remains in America of unequivocal pre-Columbian date, and bearing traces of the ravages of the disease, the question can never be finally settled in this sense (Note 7).

NOTE 5.—The Sylvius referred to is Jacques Dubois (Jacobus Sylvius), 1478-1555, Professor of Anatomy at Paris, and teacher of Vesalius.

NOTE 6.—Girolamo Fracastoro, 'Syphilidis sive Morbi Gallici, libri tres,' Verona, 1530.

NOTE 7.—See Dr. Norman Moore's summing up of this question at a recent discussion at the Royal Society of Medicine. *Lancet*, June 15th, 1912, p. 1600. While this article was in the press, a masterly summary of certain aspects of the subject appeared from the pen of Sir Henry Morris, *Lancet*, August 24th, 1912, p. 497. Sir Henry Morris produces evidence, previously unknown to the present writer, of the discovery in America of syphilitic bones of early date.



(3) 'The bark of the tree Hiouourahe' is Guaiaca which remained in use for the treatment of syphilis long after the introduction of mercury as an internal remedy about the middle of the sixteenth century. Guaiaca was probably brought to Europe from the West Indies by the Spaniards in 1508. It was described with some fulness by Oviedo in 1526 (Note 8), and recommended by Ulrich von Hutten in his classical work 'De morbi Gallici curatione per administrationem ligni guiaci,' published in 1519 (Note 9). The remedy was lauded by Fracastor and by many contemporary writers. At these early dates it was the *wood* or *bark* of the Guaiacum officinale that was used, as described by Thevet. The *resin* did not enter pharmacy until the following century, but has now replaced the wood, which is utilised in only one official preparation, the Decoctum sarsaparillae compositum.

The administration of guaiacum for syphilis is perpetuated in the German terms for the plant, Pockenholzbaum and Franzosenbaum; although gradually superseded by mercury, it was long reckoned an almost infallible remedy, so that a sixteenth century predecessor of Mr. Bernard Shaw assures us that 'the physitions wolde not allowe it, perceyvyng that theyr profite wolde decay thereby.' (Note 10.) The therapeutic value now set on guaiacum forms at least a partial excuse for these recalcitrant physicians.

The use of guaiacum as a routine treatment of yaws survived its vogue for the sister disease. In the eighteenth century it was still commonly administered (as 'Lignum vitae' or 'Lignum sanctum') to infected negroes by planters in the West Indies and other parts of tropical America. A recipe in our possession used by an eighteenth century slave-owner of South Carolina runs as follows:

'Two pounds of Lignum Vitae; four ounces of bark of Sassafras root; four ounces Aniseeds; half a pound of brown sugar; boiled in four gallons of water till reduced to three. The patient to take a pint a day mixed with three pints of water for twenty days.'

NOTE 8.—Oviedo, 'Natural Hystoria de las Indias,' Toledo, 1526, fo. xxxvii.

NOTE 9.—There are at least two works earlier than von Hutten's on the use of Guaiacum for Syphilis. One is the 'De Cura morbi Gallici' of Nicolaus Poll, printed in 1535, but dated Dec. 19th, 1517; the other is the 'De morbo Gallico tractatus' of Leonard Schmaus, printed Nov., 1518, and reprinted in the 'Aphrodisiacus' of Luisinus, 1728.

NOTE 10.—Thomas Paynel, Canon of St. Marten's Abbey, 'Of the wood called Guaiacum that healeth the Frenche Pockes and also helpeth the goute in the feete, the stoone, the palsey, the lepre, dropsey, falling evyll, and other dyseases.' London, 1533, p. 8. There are several later editions. The book purports to be a translation of von Hutten.



The recipe is accompanied with minute directions for washing the sores with tobacco juice.

We cannot but think that the evidence that the New World was the source from which the venereal plague reached Europe is strengthened by the early identification of syphilis with yaws,—a disease of admittedly exotic origin,—and by the universal treatment of both diseases with an American drug in the years when they were first recognised. That the curative value of this drug is negligible appears to us to rather strengthen the case for the American origin of both diseases.

The argument that the widespread use of a tropical American remedy suggests a tropical American origin of the disease was used by Oviedo himself, who wrote: 'I was often amused in Italy by hearing the Italians speak of the "French disease" whilst the French call it the "disease of Naples." But of a truth they would both hit its name off if they called it the disease of the Indies. And that this is the truth may be gathered from this chapter and from *many experiments already made with holy wood and guayacan*, wherewith especially, better than with any other medicine, this terrible pustulous disease is cured and healed.' (Note 11.)

(4) It has been urged against the American origin of syphilis that the natives of that continent show no immunity to the disease, but are indeed liable to an even severer type than attacks Europeans. Whatever may be the case nowadays, we have the evidence of Thevet that in the past 'the Christians whiche doe inhabite in the lande of America, if they couple themselves with the women, they shall never escape infection [i.e., by the diseases syphilis, yaws, or both], but shall fall into the daunger thereof much more sooner than they of the country.' This statement certainly seems to apply better to syphilis than to yaws, to which Europeans seldom fall victim.

(5) Lastly, it is interesting to have evidence that Sylvius believed syphilis to be of American origin. Sylvius (see Note 5) was born in 1478 and was therefore quite old enough to remember details of the great outbreak of the disease in 1494, and to this extent he has the advantage of the two great early writers on the French disease, for Fracastor was only ten or eleven years old at the time while von Hutten was but a child of six.

---

NOTE 11.—Oviedo 'Coronica,' folio xx.



Before finally leaving Thevet's book we give his account of native medical practice. The line of treatment adopted on the advice of the medicine men—'prophètes' as he calls them,—would in itself, suffice to explain the wide spread of a contagious disorder.

*'The foolish opinion of the wilde men in their prophets and of their diseases.'*

These prophets make them to beleve that they do speake unto spirites and soules of their parentes, and that nothyng



Photo by Donald Macbeth, London.

FIG. 1

to them is impossible, also that they can cause the soule to speake within the bodie.' (Note 12.)

'Moreover when soever any syche man feeleth his stomache to swelle by the occasions of some humours in the stomacke and liver, the whyche by debilitie or otherwyse he cannot cast or vomite up, he thinketh that it is his soule that complaineth. Now these goodly

NOTE 12.—An interesting account of the beliefs of the American Indians in their medicine men, closely parallel to the narrative of Thevet, may be found in Francis Parkman's 'Jesuits in North America,' Toronto and London, 1901.



Prophetes for to heale this disease wil suck with their mouth the place where the sore or disease lieth, thinking that by this meanes they draw it oute. Lykewyse they sucke one an other. The women use other meanes; they will put into the pacientes mouth a threede of cotton a two feet long, the whiche afterwarde they suck thinking also by thys threede for to get away thys disease or sicknesse. If one of them doe hurte an other in earnest or otherwyse, he is bounde to sucke his wounde untill the tyme that he bee healed.'

Text-fig. 1 is a reproduction of Thevet's woodcut, illustrating an Indian undergoing this ptyotherapeutic treatment. On one side of the patient a woman is seen with a thread issuing from her mouth, while a man on the other side sucks the lesions. Beyond is another Indian offering a medicinal plant to the sufferer.

#### V. ON CERTAIN EARLY REFERENCES TO DRACONTIASIS, THE GUINEA-WORM DISEASE

It has long been known that the Guinea-worm disease was recognised in very early times, and some have even interpreted the fiery serpents which tormented the Children of Israel in the desert as of the nature of filariae. (Note 13.) Certainly Plutarch (circ. 50-117 A.D.) makes mention of the disease, and Galen (131-210 A.D.) refers to it, though his practice in Rome placed him away from its endemic centres, and he expressly says that he has himself seen no cases. The condition finds a place in the writings of Aëtius (6th century), while Paulus of Aegina (7th century) devotes a whole chapter to the *Dracunculus*. (Note 14.)

Among mediaeval writers, the Arabian physicians, coming in direct contact with the disease, give the fullest and best accounts. We need not discuss the general question of the scientific value of their works, but it is certain that on this particular point they show accurate and first-hand clinical knowledge. Among them, the most important for our purpose is Avicenna (980-1037), who was born and spent much of his life in Bokhara, then included in the Persian empire. Avicenna, or to give him his true name, Abu

NOTE 13.—Numbers, chapter 21, v. 7. This passage is regarded by critics as part of E, the Ephraimite or Northern Israelite document, and therefore to be dated about the 8th century B.C.

NOTE 14.—The knowledge of the Guinea-worm by ancient writers is discussed fully by that sound old scholar Dr. Francis Adams of Banchory, in his edition of 'Paulus Aegineta,' Sydenham Society, London, 1846, Vol. II, p. 151.



Ali el-Hosein Ibn-Abdallah Ibn-Sina; wrote in Arabic, but his 'Canon' was frequently translated into Latin, and exercised an immense influence on European medicine as late as the 17th century. The passage which follows is from a Latin rendering, published in 1674. (Note 15.)

Canon of Ibn-Sina, Sectio III, Tractatus ii, Capitem xxi.

*'Concerning the Vena Medinensis.'*

'The signs of this condition are as follows. A pustule first appears and swells up, but afterwards contracts down again to a mere bleb. Soon, however, the bleb perforates and dark red matter is continuously exuded. In the meanwhile a vermicular movement can be distinguished beneath the skin as though some live thing were there, and indeed as we shall see, a worm is present, for so at least some regard the thing that has arisen. There are others, however, who think that the nerves of the part have become corrupted and thus the part itself affected. For the most part it is the legs that are involved, but I have seen cases in which the hands and even the sides were affected, while in children it is not uncommon to find both flanks invaded. Should the worm be ruptured, much pain and trouble ensue, and even if rupture does not take place the condition is tiresome enough . . . The disease is commonest at Medina, whence it takes its name. It occurs also in Chavorstana and in the country beyond, and is found in Egypt and in other regions.'

In the following chapter, Avicenna gives advice as to treatment, with directions as to blood letting from the saphenous vein (Note 16), diet, purgation, etc. He lays emphasis on cold applications:— 'As soon as the symptoms have been recognised, the part should be treated with wet, cold compresses, as of Sandal or Caphura, and the body purged and leeches applied.' Then 'if there is no contra-indication, an opening may be made and the worm extracted whole.'

---

NOTE 15.—By G. H. Velschius, 'Exercitatio de Vena Medinensi,' Vienna, 1674.

NOTE 16.—The Arabians paid much fanciful attention not only to blood-letting, but also to the particular vein selected for the purpose.



The next writer to whom we refer is João Rodriguez de Castell-Branco (1511-1568), better known as Amato the Portuguese (Amatus Lusitanus). This interesting character exercised considerable influence on the medical thought of his day, and was in many respects a link between the mediaeval physicians and the great seventeenth century fathers of modern clinical medicine. Amatus still claims recognition by reason of his discovery of the valves in the veins, an honour which he shares with Fabricius of Acquapendente. This discovery led to the demonstration of the circulation of the blood by Harvey, who was the pupil of Fabricius. (Note 17.) Amatus was a Jew by religion, and his hunted existence during a period of great intolerance had, at least, the advantage of giving him a knowledge of the diseases of many lands. He acted for a time as medical adviser to Pope Julius III, on whose death he was forced to leave Italy. He settled in Salonica, under the more tolerant rule of the Turk, and here he observed the disease that is the subject of these pages.

Amatus wrote as follows, in one of his 'Centuries of observations':—'A certain Ethiopian slave, 18 years of age, when first brought to Salonica from Cairo was seized with pain in the leg. An ulcer developed, in which vein-like structures became prominent. This condition is known as the *Turkish disease*, a dangerous malady which develops not only in the country from which it takes its name, but also in Egypt, India and other countries, as the Arabian physicians especially Avicenna and Avenzoar, do teach, describing it as the Medina vein. For its cure we may follow Dr. Parahyas (?Pareira) who is learned in Arabic and advises thus:—

'First, the patient ties the end of the vein or nerve round a small piece of wood, and this he winds little by little till the last part of the worm is drawn out. As the structure is often three cubits long, the treatment may last many days before the sufferer is altogether free from pain and inconvenience. Many adopt a

---

NOTE 17.—Amatus has been the subject of a recent monograph in Portuguese 'Amato Lusitano a sua vida e sua obra,' by Maximiano Lemos, Oporto, 1907. The 'Centuries of observations' of Amatus were published at various times between 1551 and his death, and the dates of their first appearances seem uncertain. They are mainly a series of clinical notes on cases. The translation here given is from the seventh century, case 64, and is from the Leyden edition of 1570, the earliest that we have been able to find of this seventh output. All his works are in Latin.



cataplasm or cold suffusion, as Soranus, Leonides, and Paulus of Aegina recommend.' (Note 18.) To this passage Amatus adds Scholia, or commentary, which runs as follows: 'Authors are in doubt whether this is a nerve, a vein or a worm. But I have seen the condition with my own eyes, and can bear witness that a thin, white worm in many coils was drawn forth . . . and if it should be broken in the process much pain and general disturbance ensues.'

Another sixteenth century writer who refers to the Guinea-worm disease is the Dutch explorer Linschoten. Linschoten made his voyages to the East in the latter half of the century, and on his return to Holland he issued a series of folio volumes with accounts of his experiences. These books were among the most popular of the period. They passed through many editions, and were translated into nearly every European language. The first edition appeared in Dutch in 1595-6 (Note 19), and in 1599 there were two Latin editions. All the early editions of Linschoten are illustrated, but the figure we reproduce (Plate XXII, fig. 1) is only to be found in the Latin editions of 1599. This we believe to be the earliest representation in a printed book of the Guinea-worm disease.

Attached to the engraving is a legend that runs as follows: 'Armusium [Hormuz (Note 20)] is the name of an island and of its principal city . . . Such is the heat of the sun there, that no tree can put forth leaves nor can grass grow, so that the earth is barren and brings forth nothing but scorpions and sandstone. The houses are built with a single large aperture in the ceiling for the admission of light and air. The inhabitants, in order to avoid the great heat, sleep at night, men and women together, immersed but for their heads in troughs of water. Thus it comes about that they are infected by worms, which grow in their legs, and are two or three feet long.' In the reproduction of the plate (Plate XXII, fig. 1) the figure outside may be seen winding the worm from his leg, and a

NOTE 18.—Soranus of Ephesus was a contemporary of Galen. Only fragments of his work have survived, but reference is made both to him and to Leonides by Paul of Aegina. The sentence is practically quoted from Paul.

NOTE 19.—Jan Huygen van Linschoten, 'Reys-Gheschrift Vande Navigatien der Portugal-oyers in Orienten,' Amsterdam, 1595, and 'Itinerario voyage ofte schipvaert,' Amsterdam, 1596. The Latin translation from which our figure is taken is entitled 'Vera Descriptio regni Pars Indiae Orientalis in qua Johan. Hugonis Lintscotani Navigatio in Orientem . . . accurate propununtur,' by Teucrides Annaeus Lonicer, Frankfort, 1599. Folio. There is a separate Atlas of plates to this Latin work, by the brothers de Bry.

NOTE 20.—Hormuz, an island at the mouth of the Persian Gulf.



hiatus in the wall introduces us to the ménage of other natives of 'Armusium.'

During the course of the seventeenth century the French were very active in missionary enterprise. About the middle of the century, Mgr. de la Motte Lambert, Bishop of Beirut, undertook a pastoral tour to the far East, and an interesting record of his experiences was published. (Note 21.) Crossing Persia from Ispahan to the coast, he passed through the town of Lar, the capital of Laristan, and not very far from Bandar Abbas. He says . . . 'It is well provided with fruits, but the water of the town is very bad and the cause of severe and mortal diseases. To this bad water supply throughout the country between Lar and Gomeron (Note 22) may be attributed certain worms of a prodigious length, which engender in the thighs and legs. These worms lie hid, tortuously entwined in the flesh. When detected, a little incision is made to get at the head, this is attached to a piece of stick, and the stick turned a little each day. The worm, which is often six feet long, is thus wound out into a skein. Should it break, the part which remains will cause a dangerous corruption. *The way to avoid this worm is to drink only wine, or if water is used, only such as has been carefully filtered through linen.*'

We have yet to refer to one other early writer on the Guinea-worm, who transcends and includes all the others. The whole field of early references to the Dracunculus has been traversed by G. H. Velschius, who in a portly volume under the title 'De Vena Medinensi' (see Note 15), brings together every possible and a great many impossible references to that parasite. Velschius, though a dreary and not very accurate writer, is valuable for his extensive first-hand acquaintance with Arabic literature. A man of great learning and antiquarian interest, he was yet fully acquainted with the rapidly accumulating scientific knowledge of his day, and in this work he has thrown down a gauntlet of unattractive learning, which none are likely to take up.

He seems to have suffered from a sort of dracuncular obsession,—

---

NOTE 21.—Relation du Voyage de Mgr. l'Eveque de Beryte, Vicaire Apostolique du royaume de la Cochinchine, par la Turquie, la Perse, les Indes, etc., jusqu'au Royaume de Siam et autres lieux. Par M. de Bourges, Prêtre, Missionnaire Apostolique. Paris, 1666.

NOTE 22.—Gomeron, a town on the Gulf of Oman which we are unable to identify.

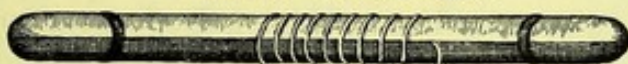


Guinea-worm on the brain,—and saw the object of his study everywhere. In some respects his book reminds one of the Garden of Cyrus of his contemporary, our own Sir Thomas Browne, but he writes like Browne with all the magic left out. As the great stylist pursued his 'quincunx' through heaven and earth and into the waters under the earth, so does Velschius his *Dracunculus*. He sees it everywhere, on ancient Roman emblems, in the signs of the zodiac, among marine nemertines and polychaets, in the serpent on many antique coins, in Arabic lettering, in many Greek

*Instrumenta Chirurgica ad extractionem dracunculorum.* Pag. 330.  
I. *Hemiglandria aperta, cum annulis suis.*



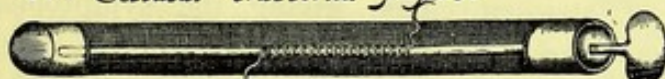
II. *Hemiglandria annulis suis conjuncta et clausa cum dracunculo circumvoluto.*



III. *Cylindrus alius medio fissus, qui annulo digitis protruso ardetur.*



IV. *Collabus tractorius simplex*



VII  
*Spheniscus  
Aristophanus  
Scholiasta*



V. *Vertibulum trochleare*



IX  
*Spheniscus  
Iamblichus  
Ionicus*



VI. *Cylindrus alius, forcipis linteary figurâ.*





sculptures. The famous Laocoon group with its three figures struggling with gigantic serpents are for him a very personification and apotheosis of his Medina worm. He discerns a suggestion of the creature in the thecae of the serpulidae that in some places litter the rocks of the seashore, in the intestinal worms of men and animals, in the convoluted viscera of decapod crustacea, in architectural devices, and in designs of Albrecht Dürer and other artists. The very emblem of our profession gives him one of his best opportunities, and in the serpents coiling round the staff of Aesculapius he distinguishes a Guinea-worm which that distinguished physician has just extracted by entwining it around a piece of wood!

We give in Plate XXII, fig. 2, a reproduction of Velschius' idea of a patient suffering from dracontiasis. The figure, evolved from his inner consciousness, represents in one devoted and saddened individual a number of accounts of the condition.

We part with our subject in Text-fig. 2, which displays the instruments for the extraction of the worm recommended, if we may believe Velschius, by a formidable array of authorities.

#### VI. MEASURES TAKEN IN PARIS IN 1533 TO PREVENT SPREAD OF THE PLAGUE

During the centuries when the Plague was a regular visitor to Europe, it was the custom to distribute plague leaflets to the inhabitants of stricken cities, giving the symptoms, directions for treatment, and instructions for avoiding infection. The 'Pestblätter' date back to the very early days of printing, and a number are known which were issued in the fifteenth century. (Note 23.) These leaflets are frequently illustrated. A favourite theme was a figure exhibiting buboes and other signs of the plague, and pierced by arrows according to the words of the Psalm (Ps. XCI) 'Thou shalt not be afraid . . . for the arrow that flieth by day nor for the pestilence that walketh in darkness.' The pamphlet here described was however a more ambitious and official attempt to regulate the public health, and was issued as a

---

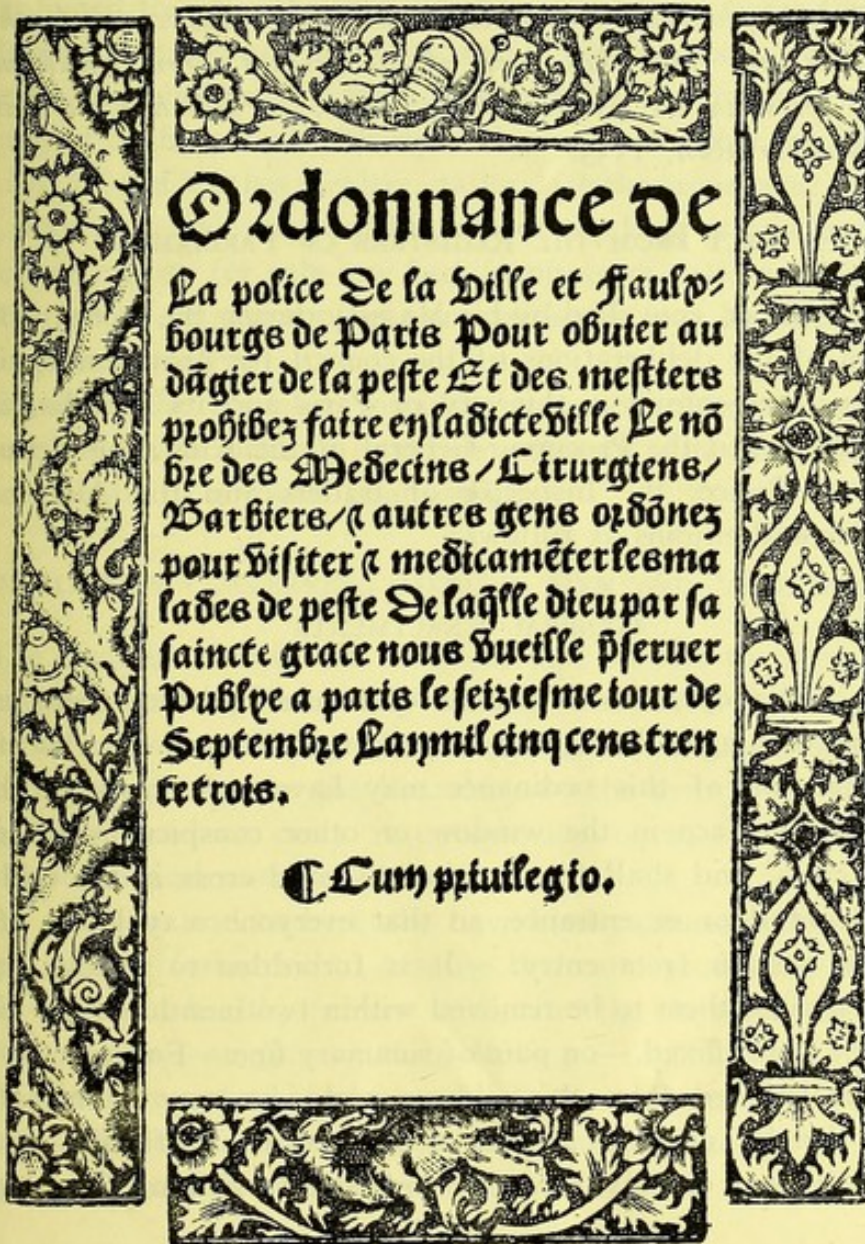
NOTE 23.—Many of these leaflets are most beautifully reproduced and described in a volume entitled 'Pestblätter des XV Jahrhunderts,' by P. Heitz and W. L. Schreiber, Strassburg, 1901.



black letter booklet, and circulated in Paris in 1533. We give below a translation of nearly the whole pamphlet, but we have added headings for the reader's guidance, and we have mitigated the length by omitting the constant repetitions which appear necessary to all legal documents.

Our cordial thanks are due to Mr. Osman Edwards for assistance in translating some of the obscurer passages.

The general regulations are similar to those adopted in the Great Plague of London of 1665, which may be pleasantly followed in





Defoe's *Journal of the Plague Year*. In reading the rules for cleansing the streets, it should be remembered that the gutters were in those days in the middle of the roadway, and conducted a flowing stream which acted as the common sewer.

In the course of the 'Ordonnance' the doctrine of fomites will be found implicitly involved, although it was several years before Fracastor gave it precise formulation.

*POLICE ORDINANCES FOR THE CITY AND SUBURBS OF PARIS to prevent spread of the Plague, to regulate trades, to provide for Physicians, Surgeons, Barbers and others to visit and treat those sick of the disease, from which may God preserve us by His holy grace. Published at Paris, September 16th, 1533.*

#### EXTRACT FROM THE REGISTERS OF PARLIAMENT

The Chamber, convoked by his Majesty during the recess, (after recitation of the deliberations of the council for provision against the plague now raging in this city of Paris and its suburbs, and having summoned the Procureur-General of the King, the Deputy-Provost of Police, the Inspector of traders and the Aldermen) commands and enjoins as follows:

#### GENERAL ENACTMENTS

. . . All proprietors or tenants of houses in which there have been cases of plague during the last two months, and all who after the publication of this ordinance may have such cases in their houses, shall place in the window or other conspicuous place a wooden cross, and shall fix or raise a second cross in the middle of the front door or entrance, so that everyone may know of it and may abstain from entry. It is forbidden to remove these crosses or cause them to be removed within two months of the time when they were affixed,—on pain of summary fine. Furthermore all who have suffered from this disease and who may be hereafter afflicted thereby, and all members of households and families where there have been or may hereafter be patients sick of the plague



are commanded and enjoined that they carry in their hands when going to and fro a white rod or staff,—on the same penalty.

The Chamber forbids anyone of any rank, quality, or condition whatsoever to carry or cause to be carried to this town or its suburbs from other places, or to transport or cause to be transported from one house, tenement, dwelling or lodgement where there has been a death from or risk of plague, to other houses or lodgements within the town any bed-coverings, coverlets, quilts, or woollen, serge, linen or similar goods, capable of harbouring the plague, whether such goods belong to them by succession or otherwise. All are enjoined to leave the said goods in the places where the death or danger from plague has occurred, until they receive permission from the Chamber or from the aforesaid officers to transport them,—on pain of confiscation of liberty and goods. Further the Chamber forbids all old clothes dealers, tailors, clothes-repairers, hawkers, etc., male or female, and all subjects of the king or of other states to sell or expose for sale any bed furniture or articles of costume or other goods, in which plague or noxious air may be harboured,—on the same penalty.

Similarly the Chamber forbids any person of whatsoever rank to visit any public bathing establishment until after next Christmas day,—on pain of corporal punishment.

#### ENACTMENTS CONCERNING MEDICAL MEN AND VETERINARIES

The Chamber forbids all surgeons and barbers to throw blood of patients suffering from any malady whatsoever into the river Seine in its course through Paris, (the horse knackers' establishment being regarded as the boundary of the town), but they are enjoined to send or carry it outside the town,—on penalty of imprisonment and summary fine.

All surgeons and barbers who have bled patients suffering from the plague are forbidden to practise their art, profession or trade on the bodies of healthy persons until after the elapse of the period enacted by law,—*on pain of the halter*.

Furthermore, when horses are bled, the use merely of lime or earth is forbidden; but the blood is to be caught in a vessel, and carried to the sewers outside the town.



## RULES FOR CLEANING THE STREETS, ETC.

The Chamber commands all persons of every rank and condition that they shall henceforth pave and repair broken and cracked roadway in front of their houses. They shall keep the roadway in good repair and ensure its cleanliness by throwing down water, morning and evening, each in front of his own door. And they shall see that the streams of the gutters have an unimpeded course past their houses, so that no filth may accumulate. Nevertheless when any rain or other thing may fall from heaven, all cleaning, sweeping and scouring shall be withheld until the rain has passed and has drained away, so that the water have as free a course as may be . . . It is forbidden to throw out of window infectious filth or garbage or dirty water, or to keep it within the house, but such refuse must be carried to the stream, and a bucket of pure water thrown in after. Whoever carries urine to the doctor to be examined, is forbidden to cast it into the streets, but must carry it back to his house and there throw it into the stream in front of his door, casting after it at least three buckets of water. These things shall be done on pain of corporal punishment and summary fine according to the exigencies of the case.

The Chamber expressly forbids any person of whatsoever rank to empty or throw filth or garbage unsuitable for the gutter into the open street or to burn it there, but enjoins them strictly to carry it or to have it carried into the fields to the appointed places, permitting them if they have not dung carts, vehicles or drivers immediately available, to enclose it in baskets or hampers and place these alongside their houses that they may be carried off as soon as possible.

The Chamber forbids stone-cutters, masons, tilers, and others working for them to empty or cause to be emptied from houses gravel or other things which may harbour infection, unless they have vehicles and drivers ready to carry away the said refuse as fast as it is taken from the houses to the appointed places in the fields,—on pain of imprisonment and rigorous punishment at the pleasure of the law. Nevertheless the Chamber ordains that masters and mistresses shall be responsible for their varlets, servitors and maids on the subject of this and the preceding article, beyond the punishment which may ensue to the said varlets, servitors, and maids.



Similarly the Chamber commands the sanitary inspectors and other such persons that with no further excuses they shall apply themselves to the scouring and cleansing of the roads of this town, that all filth and garbage may be carried away,—on pain of prison and summary fine. Further, the dung carts shall be ready with their horses, and shall be well closed up so that nothing can issue from them. And the tailpiece of the cart shall be as high or higher than the front,—on pain of imprisonment and confiscation of the horses and dung carts and of summary fine. All police and citizens of Paris who shall see or find such dung carts not properly closed shall take them or cause them to be taken to the prison to be suitably dealt with.

Further, the Chamber forbids all butchers, cooks, bakers, hucksters, dealers in game and poultry, taverners, labourers, traders, and other persons of whatsoever station or condition, to keep or rear in this town or its suburbs any hogs, sows, fowls, geese or pigeons, either for their own nourishment, for sale or for any other reason, excuse or plausibility whatsoever. It enjoins that if any persons possess such live-stock at the time of publication of this present ordinance, they shall convey the said live-stock or cause it to be conveyed into the fields beyond the town,—under penalty of imprisonment and severe punishment at the discretion of the magistrate and of confiscation of the live-stock. Similarly the Chamber commands all who shall have knowledge of any contravention of this ordinance that they shall make it known to the magistrate with all diligence, for the execution of suitable punishment.

The Chamber enjoins all proprietors of houses with middens or cesspools that they shall with all speed and diligence wall them up,—on pain of the rent of such houses being seized by summary order of the Chamber and applied to the walling up of the said cesspools or middens. And it is moreover forbidden in future to any cleaner of cesspools to empty or clean them out without express permission of the magistrate.

This Chamber expressly forbids all sojourners and inhabitants of this town of Paris to place or cause to be placed any cloth or other hanging from the window sills of their houses.



## THE DUTIES OF MAGISTRATES AND OTHERS

Moreover, the said Chamber commands the officers examining magistrates of the prison of Paris, that they cause this present ordinance to be strictly observed and fulfilled, and empowers them to imprison all those who contravene the same, that they may be punished according to the exigencies of the case. The Chamber enjoins the divisional police to render every assistance in their power to the said officers, and to inform them of any trespass or crime which comes to their knowledge. And that the commissioners be the more zealous to maintain this ordinance and to execute arrests and imprisonments, and that the divisional police may make the necessary accusations, the Chamber ordains that they shall have letters-patent of compensation.

## ENACTMENTS FOR THE MEDICAL FACULTY

This Chamber orders the faculty of Medicine to depute four doctors of medicine, expert in theory and in practice, to visit and treat the plague-stricken patients in the town and its suburbs. For this service they shall each receive three hundred pounds for the current year, of which one fourth shall be paid to them in advance. Further, the College of Surgeons of this said town shall elect two sworn master surgeons, fit to visit, treat and consider those sick of the plague, and each shall be guaranteed one hundred and twenty pounds during this present year, of which they shall similarly receive one quarter in advance. Similarly, the congregation and assembly of sworn barbers of this town shall elect six sworn master barbers to visit, comfort, treat and support the said sufferers from plague, and each of them shall be paid during this year eighty pounds. The Chamber hereby pledges itself to the payment of all the above charges.

Also the Chamber commands the said four doctors, two surgeons and six barbers who shall be elected and commissioned, that during the time aforesaid and for forty days thereafter or until it shall be otherwise ordained by the Chamber, they shall abstain from seeing, visiting or treating other persons not plague-stricken; and the said surgeons and barbers are enjoined that they keep their offices shut during the time aforementioned,—on pain of corporal punishment, deprivation of status and summary fine.



## POLICE ORGANISATION

The Chamber ordains that the commissary of each quarter, with the assistance of two churchwardens of the parish, shall depute persons in every parish to remove plague-stricken corpses from the houses, to bury them, to remove their furniture to the appointed place, to cleanse the houses, to set open the windows and apertures of these houses, to shut the doors and to attach crosses to them. The pay of such persons shall be six pounds of Paris per month.

Also the commissaries shall locate in each quarter four beadles armed with staves, who shall enforce the execution of these duties on the persons deputed by the commissaries and churchwardens.

And the Chamber forbids all physicians, surgeons, barbers, apothecaries, nurses and others who shall have visited, aided, helped, served or assisted any of the plague-stricken, to communicate with any others until forty days have elapsed from the day when they visited, nursed, aided or assisted the plague stricken . . .

## REGULATIONS FOR CERTAIN TRADES

All curers and tanners of hides are forbidden to carry on their trades in the city and suburbs, but they are permitted to work beyond the suburbs at the river Seine below the town on the St. Germain's side of the meadows. They are to keep at a distance of over two bowshots from the town,—on pain of banishment from the realm and confiscation of property. Curriers and tanners are moreover forbidden to sell their merchandize within the town, even though the hides are free from infection and bad odour.

Until otherwise ordained, all furriers, leather dressers, cloth-dyers and those of similar estate are forbidden to do their muling, dressing or dyeing within the town and its suburbs. They may not carry woollen stuffs or fabrics to be washed in the Seine above the Tuileries, nor may they pour the washings of such materials into the river within the said limits, nor may they air them nor expose them for sale, though these favours are permitted them below the town on the St. Germain's side, as with the hide-dressers . . .

All butchers, pork butchers and those of similar estate are forbidden to make abattoirs or tripe-dresseries within the town and its suburbs, except in those ancient spots set aside from time immemorial for the royal butchery.



All sellers and hawkers of sea-fish and other similar traders are forbidden to perform any gutting operations within the town and its suburbs.

All undertakers are forbidden to spread in the churches, houses, gâtes or doors, cloths or other articles used in mortuaries—on pain of loss of license and rights, and confiscation of goods and of the said cloths. . .

#### CONCLUSION

Further, the Chamber enjoins on all sojourners and inhabitants of this town and its suburbs that if there should be hereafter found any defilement or suspicion of plague, they shall reveal it immediately to the local heads of police without respect of persons or exception for husband, wife, child, servant, master or mistress; so that the commissary may be informed and that he may at once take steps as enjoined by the Chamber.

And finally the Chamber enjoins on the Provost of Paris or the Deputy Provost of Police to cause the present ordinance to be read and published at the cross-roads of this town, that none may pretend ignorance but that it may be kept and observed strictly.

Enacted by the Chamber by command of the King during Vacation the thirteenth day of September in the year One thousand five hundred and thirty-three.



Figure 1 shows the relationship between the rate of change of the concentration of the reactants and the rate of change of the concentration of the products. The rate of change of the concentration of the reactants is shown by the solid line, and the rate of change of the concentration of the products is shown by the dashed line. The two lines intersect at the point where the concentration of the reactants is equal to the concentration of the products.

Figure 2 shows the relationship between the rate of change of the concentration of the reactants and the rate of change of the concentration of the products. The rate of change of the concentration of the reactants is shown by the solid line, and the rate of change of the concentration of the products is shown by the dashed line. The two lines intersect at the point where the concentration of the reactants is equal to the concentration of the products.



## EXPLANATION OF PLATE XXII

Figure 1.—Natives of the island Armusium (Hormuz). On the left they are represented as sleeping in troughs of water; on the right the figure in the foreground is engaged in removing a Guinea-worm from his left leg. Another worm coiled round a piece of stick is seen in the calf of the right leg.

From Lonicer's '*Vera Descriptio regni Pars Indiae Orientalis*,' Frankfort, 1595.

Figure 2.—From G. H. Velschius '*Exercitatio de Vena Medinensi*,' Vienna, 1674. The figure shows a man extensively infected with Guinea-worms, and to it is attached a legend to the effect that it is 'adapted from the accounts of Guenocius, and shews the Medina veins lying coiled in the thighs, legs, arms and trunk.' It is supposed to represent a West African scene.



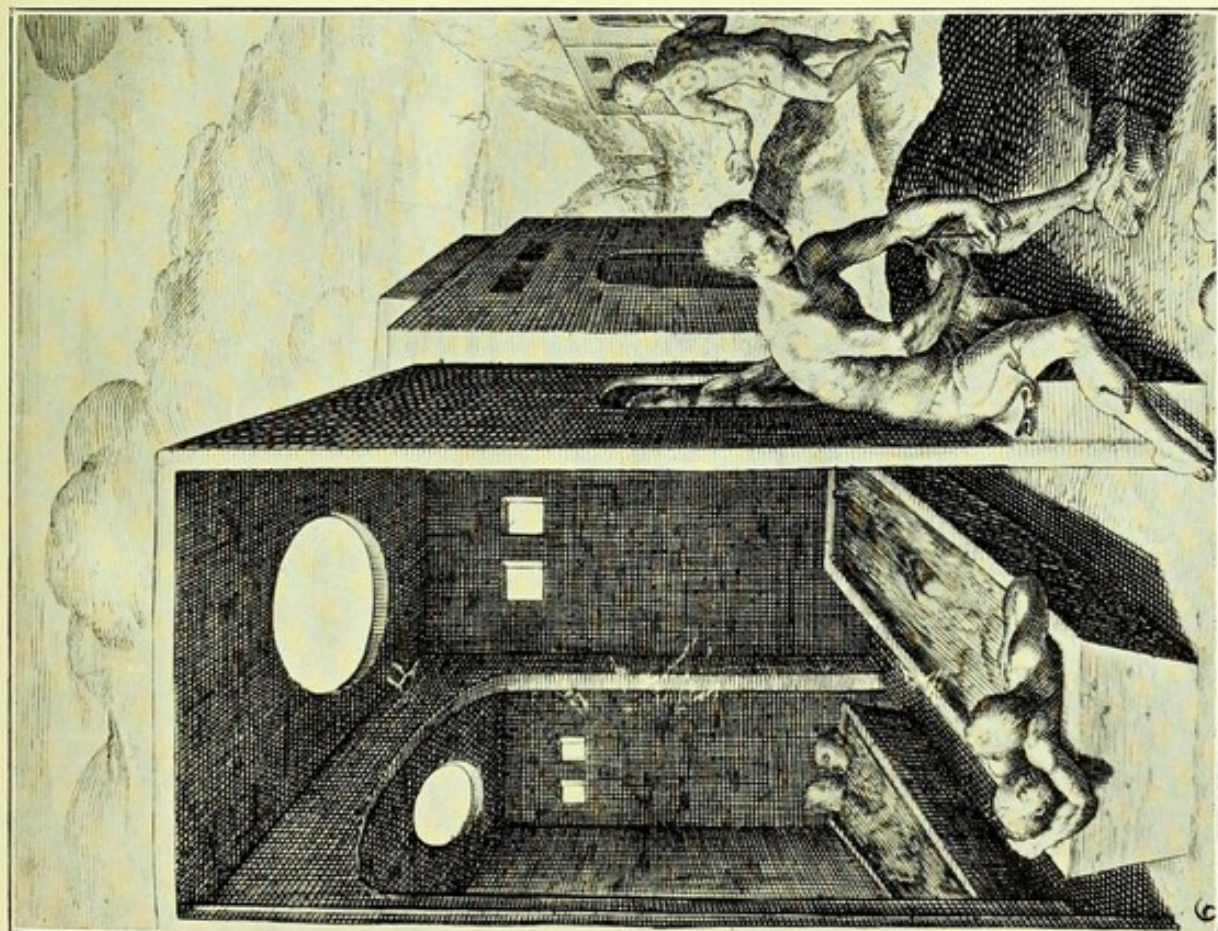


Photo by Donald Macbeth, London.

FIG. I

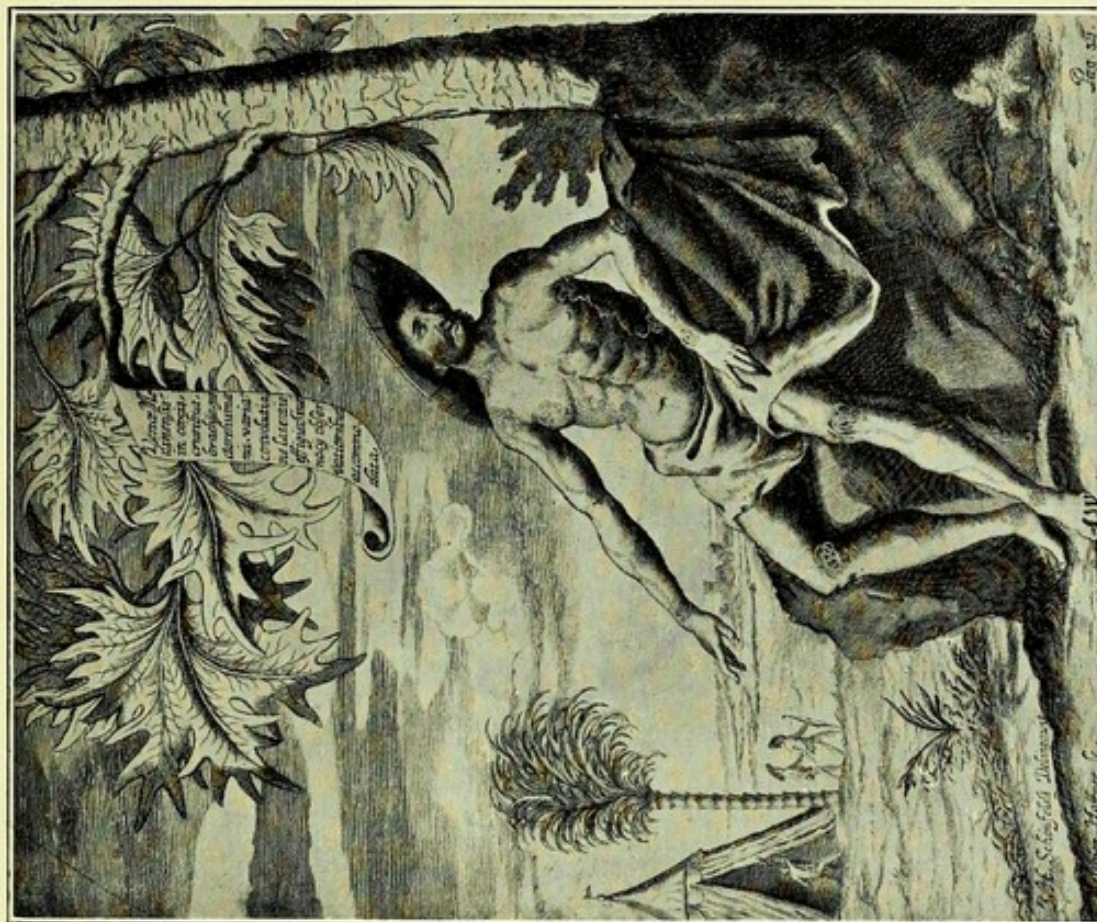


Photo by Donald Macbeth, London.

FIG. 2



