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Epidemiological Society of London.

INAUGURAL ADDRESS OF SESSION 1893-4.

ON THE HISTORY OF EPIDEMIOLOGY IN ENGLAND.

BY

JOSEPH FRANK PAYNE, M.D., F.R.C.P., PRESIDENT.

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TRANSACTIONS

OF

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INAUGURAL ADDRESS OF SESSION 1893–94.

On the History of Epidemiology in England.

By JOSEPH FRANK PAYNE, M.D., F.R.C.P., President.

(*Read: November 15th*, 1893.)

Gentlemen,—In taking the chair of this Society for the second time, I thought that it might be of interest to collect some notes relating to the history of the science with which our Society concerns itself. I make no pretension to relating the history of epidemiology, but only wish to bring before you some few episodes illustrating the rise and development of the science in our own country.

The conception and even the name of a science of epidemic diseases began long before with Hippocrates, and his treatise bearing the name of the *Epidemics* has been consciously or unconsciously the model of much that has been written since. The seven books thus named contain, indeed, many things not bearing on epidemics, but we find, especially in the first and third, which are regarded as the only genuine books, the two essential features of epidemic science; firstly, an account of the prevalence of certain diseases in particular seasons and their supposed relation to weather and climatic influences; and, secondly, clinical histories, as we should now call them, of the illnesses of particular patients. Under the first heading comes the description of certain states of the weather and of diseases in particular seasons. Each of these states is called by a name (κατάστασις), which was afterwards rendered "epidemic constitution", and each appears to give the history of the seasonal peculiarities of a particular year. Here we have undoubtedly the germ of the idea so prevalent in later writers of a particular *epidemic constitution* impressing a special character upon the diseases of the season in which it prevails, or, again (though this is a more modern idea),

favouring the occurrence of particular diseases. The accurate records of individual cases contained in this work have always been celebrated, and we can only regret that this feature of the writings of Hippocrates was so little imitated by later writers on the same theme. I show you an edition of the *Epidemics* brought out by Freind, the historian of medicine, in 1717.* This work of the father of medicine was copiously annotated by Galen, who valued it very highly, and it always maintained a high reputation; but I cannot now follow the development of the doctrines of Hippocrates in Greek or Roman, or even in early mediæval times. We must plunge at once into that part of medical history which concerns our own country.

Mediæval Medicine.

Mediæval medicine, as we see it first beginning to emerge from obscurity in the thirteenth and fourteenth centuries, offers the greatest possible contrast to the spirit of the age of Hippocrates. I need hardly remind you that such medical knowledge as then existed was a tradition derived chiefly from the Greek and, in a very small degree, from the Latin medical writers, but transmitted through the literature of a totally different race—*i.e.*, the Arabs. Ancient medicine was known in the early Middle Ages chiefly in an Arabian dress. The fathers of Greek medicine, unknown in the original, were read in Latin translations of Arabic works, which were themselves translations or compilations from the Greek. Moreover, such medical science as existed was wholly traditional. Original observation, or the record of first-hand experience, did not exist. It seems to have been impossible for men to record natural facts and appearances as directly observed by their own faculties—the physicians, at all events, did not attempt to do so, and lay-writers often give us better pictures of an epidemic disease. When the doctors wrote about disease it was merely to put down what Hippocrates, Galen, Avicenna, or Razes, or their translators—Constantine and the rest—had laid down on the subject. They never ventured to set their own experience against the dogmatic teaching of the authorities. In this they were often conscientious, probably, and thought that they were serving the cause of truth better by accurately copying the dicta of the ancients than by trusting to their own experience, which was limited, or

* Hippocrates on Epidemic Diseases: De Morbis Popularibus. Edited by John Freind. London, 1717.

to their own senses, which might possibly mislead them. All this was as true of anatomy and of botany as of practical medicine.

Such inordinate respect for authority is certainly not to be found in any of the writers of antiquity, and we can only explain its prevalence in mediæval Europe by a transference to science of the conception of infallibility which was always associated with theology. Whether it was also true of the Arabians, who also possessed an infallible written dogma, I am unable to say. With reference to our particular subject, this slavish habit of mind had, however, one very unfortunate consequence, viz., that it prevented mediæval physicians from making any direct observations which might serve as the basis of a science of epidemics. It is true that they were acquainted with certain diseases not known to the ancients, among which small-pox and measles were the most conspicuous. Many mediæval writers, including the earliest English physicians whose works have been preserved—viz., Gilbertus Anglicus and John of Gaddesden—have left descriptions of these two diseases, and it is interesting to see how they described them. When we look into their descriptions carefully it is difficult to believe that they were founded on actual observation. The symptoms, the causes, and the treatment are given in almost identical language by a whole school of writers, who we find on examination have transcribed them almost literally from the Arabians, especially from Razes and Avicenna. Grüner published in 1790 a valuable collection of the passages of these writers referring to small-pox and measles, though he omitted to quote from Gilbert, and a collation of these passages shows how little originality these writers display.*

Gilbertus Anglicus.

Gilbert, as the earliest English medical writer whose works can be certainly identified, deserves, therefore, a little consideration. A notice of his life may be found in the *Dictionary of National Biography*. There is some difference of opinion as to his date. I myself believe, for reasons which I cannot now give, that he lived at the latter end of the twelfth and beginning of the thirteenth century. He was certainly in the East at the time of the Crusades,

* De Variolis et Morbillis : Fragmenta Medicorum Arabistarum, etc. Edidit C. G. Grüner. Genæ, 1790.

and probably during the third Crusade, that in which Richard I of England took part. His chief work, *Compendium Medicinæ*, exists in two editions, printed abroad, and in MS. copies, of which I am able to show you one to-night.* It was never printed in England, and it does not seem to have been translated into English. It is a systematic Latin text-book, founded on Arabian writers and their copyists. His chapter on small-pox and measles is important, because it seems to have been made use of by later writers, especially by the better known John of Gaddesden. We find here the original indication of Gaddesden's celebrated cure of a royal prince affected with measles, by wrapping him in scarlet cloth and surrounding him with scarlet hangings. It should be stated, however, that Gilbert does not make himself responsible for the advice. Gilbert makes a clear distinction between small-pox and measles; nevertheless, one feels some doubt, as I have remarked before, whether this distinction is based on his personal experience. However, in order that you may judge of this point for yourselves, I will endeavour to give you a short summary of what Gilbert actually says about these diseases, passing lightly over his pathology.

"Variolæ and Morbilli belong to the genus of 'infectious and universal diseases', the only other diseases of this class being 'Morphœa, Serpigo, and Lepra'. But Variolæ and Morbilli also belong to the class of 'Apostemata [that is, matters separated from the blood], and these two are the only 'compound hot apostemata' called by Avicenna pestilential, which follow and accompany fevers, though other apostemata may be followed by fever. They arise from an impure moist matter, shut up in the body, as from impure blood. Nature cleanses the internal organs by driving the poisonous material to the outside, whence the vulgar assert that persons thus affected never become leprous.

"They occur especially at that time of life when heat and moisture abound, or in infancy; often in adolescence, and in the third place in 'juvenes' [young adults up to middle life]." In another place Gilbert says they occur very rarely in the old, but it is not quite clear whether this refers to these diseases generally, or only to one particular kind of eruption.

He says there are four kinds of these diseases. The second is described as "the kind in which the pustules [*i.e.*, spots, not necessarily pustules in our sense] are very small and red, and are properly called *Morbilli* or *Veterana*, and this kind is spotty (*maculosa*). Variolæ and morbilli differ in form and substance. Variolæ are large, and composed of 'coleric' matter, and hence called by Avicenna 'variola colerica'. Morbilli are smaller than variolæ, and do not pierce the skin. Variola makes a projection on the surface." The other three kinds of eruption I will not undertake to discriminate; but they are described as different from variolæ and morbilli.

"The signs of variolæ before the eruption appears are: high fever, redness of the eyes, pain in the throat and chest, cough, itching in the nose, sneezing, irritation or pricking (*punctiones*) in the skin. The disease affects especially

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* Gilbertus Anglicus: Compendium Medicinæ. Folio MS. on vellum. Fifteenth century.—The same work. Printed edition. Lyons, 1510.

the upper part of the body, as is shown by pain in the chest, cough, and the like.

"The term *variola* comes from the variety of colour, being sometimes white, orange, green, violet, or black: the more they approach to black the more dangerous they are. *Morbillus* means *morbus minutus*. As to prognosis, some variolæ are harmless, some extremely fatal, some intermediate. One great danger is syncope, or failure of the heart.

"In the treatment, the great thing is to avoid cold; no external applications which might drive the eruption back are to be used. Warm medicines are suitable at first to expel the morbid matter; but if the fever increases after the eruption these are to be avoided, especially if the tongue is rough and black. Venæsection may be employed at first, but not after the fourth day. When the eruption has appeared, wait for its maturation and restoration to health. The pustules are sometimes opened with a golden needle, otherwise they are left to nature, and dry up. Ulcers sometimes occur after variola. There are certain parts which must be especially guarded from harm, viz., the eyes, eyebrows, nose, lungs, intestines, and throat. The eyes are sometimes ulcerated and the sight destroyed. The nose may become ulcerated, and also the œsophagus, so that swallowing may become impossible. The affection of the lungs leads to dyspnœa, and sometimes to phthisis. Ulcers of the intestines cause violent diarrhœa, sometimes intractable and even fatal." Various local remedies are suggested for these complications. The treatment of lung affections is said to be very difficult. Children should have their arms tied to prevent them from scratching. Old women in the country give burnt *purpura** in drink, for it has an occult power of curing variola. Similarly cloth dyed with grain (crimson).

This account is chiefly taken from Avicenna (*Canonis*, Liber iv, Fen. prima, tractatus quartus), and perhaps partly from the works of Razes, but not from the work of the latter now called *De Variolis et Morbillis*, which could not have been known to Gilbert. It is noticeable that Gilbert omits some of the early signs of variola mentioned by Avicenna, such as pain in the back, headache, and mental disturbance. There is no hint in either author of personal contagion. It is evident that parts of the description would apply to measles, scarlatina, small-pox, and perhaps chicken-pox, but it does not give a clear picture of any one of these diseases. How far, therefore, they were actually known to Gilbert I will not now attempt to decide.

John of Gaddesden was the author of a very popular Latin work called *Rosa Anglica*, which was twice printed on the Continent, though never in this country, and is not known to have been translated into English.† His account of small-pox and measles is much like that of Gilbert, but it is remarkable that he quotes the English name "mesles"

* *Purpura* means a shell-fish, used to obtain the crimson (purple) dye; viz.:—*Buccinum lapillus*, the common whelk, or other species. It was long used, or at least spoken of, as a medicinal simple in the Middle Ages, and appears in the first Pharmacopœia Londinensis. The burnt shells were used chiefly as an external application for ulcers and the like; but it is evident they could not have had a purple or red colour, so that there must have been some confusion as to red cloth, and the whole legend may have been founded on a mistake.

† John of Gaddesden: Rosa Anglica. Folio. Venice, 1516.

in his Latin treatise, though in a somewhat ambiguous sense. He does not refer to any distinctive epidemics of this disease, nor does he quote any cases except the one of the royal prince already referred to, so that it is impossible to call his work, any more than that of Gilbert, a valuable contribution to epidemiology. All that we can make out with certainty is that he was acquainted with one or more eruptive diseases, producing red spots or pustules, giving rise to irritation, and likely to leave permanent marks. These he describes traditionally as variolæ and morbilli. But it should be borne in mind that the traditional character of these descriptions given by mediæval writers is no proof of the absence of direct observation. It only proves that these writers were not accustomed to record their own observations at first hand. These two writers are the chief representatives of mediæval medicine in England, as the celebrated John Ardern was of mediæval surgery, and there are others whose works still exist only in manuscript; but it must be confessed that up till the sixteenth century we have no direct observations either on epidemics or on sick persons which can supply any material for a knowledge of the diseases of that period.*

Revival of Greek Medicine.

We must pass on, then, to the time when medicine began to be once again, as it was in the days of Hippocrates, objective, real, and descriptive. European medicine, from the sixteenth century onwards, begins to deserve this character; and in the first place, the question suggests itself, How did the change thus characterised come to be effected? The true answer to this question would be a long one, but briefly we may say that men got out of the habit of slavish respect for written authority, not by neglecting that authority, but by studying it more profoundly. It was the revival of Greek medical literature in the original which, strange to say, brought medicine back to the study of nature. The extraordinary stimulus given by direct study of Greek scientific writers is shown by the fact that these who revived the study of anatomy, like Vesalius, or

* Since this address was delivered, my friend Dr. Norman Moore has kindly given me a reference to the use of the word "Small-Pocks" in a MS. of the *Breviarium Bartholomæi* of John Mirfeld, who lived in the fourteenth century. Dr. Moore says: "The words 'smal pockes' are on fol. 43*a* of the Pembroke College MS. of Mirfeld, near the heading of the chapter 'De Variolis et Morbillis'. The late Professor Chandler [of Oxford] thought the entry contemporaneous."

the study of botany, like Brunfels, Fuchs, Matthioli, and many others, were Greek scholars. They studied Galen and Aristotle without adoration indeed, but not without the deepest respect. This was also true in England of the learned Greek scholar, John Caius, an enthusiastic student of Galen, who first gave an original description of a disease which he had observed himself, uninfluenced by tradition, and where, indeed, he had no traditional authority to guide him.

The Sweating Sickness.

Caius is well known as having described one of the great epidemics of the sixteenth century, the last outbreak of the sweating sickness. On this subject he wrote two books—one in Latin, the other in English. The latter, entitled *A Book or Counsel against the Disease commonly called Sweat*, and published in 1552, though exceedingly rare, has often been quoted; but the Latin treatise *De Ephemera Britannica* is, from a medical point of view, much more valuable. I am able to show you copies of both.* The Latin book, intended for the profession, contains a good description of the symptoms of the disease, from which I will read a short extract, and will venture to give it in English:

"Those whom the disease attacked it tormented in the following way. In some it first seized upon the neck or the shoulder, in others the leg or the arm. Some had a feeling like spirits or warm breath running through their limbs. Along with this, and without any cause apparent to those who were unfamiliar with the disease, a profuse perspiration broke out. The internal parts were first of all warm and afterwards burning, while the heat spread to the external parts of the body. Terrible thirst and restless tossing about followed. The heart, liver, and stomach also suffered from the disease. After all this there succeeded severe headache, with senseless muttering delirium; then drowsiness, and an almost unconquerable desire to sleep; for this disease possesses some virulent poison derived from bad air, which infuriates the mind and then overcomes it with sleep. On the other hand, in those cases in which the sweat was restrained in the first instance there were slight shivers, but afterwards, when the perspiration broke out, it was of a bad odour and colour, differing according to the kind of humour, sometimes scanty, sometimes abundant, but always thick in substance. Some suffered from nausea and some from vomiting, but very few did so, and for the most part only those who had been recently eating. In all the breathing was laboured and rapid, and the voice hollow. If you felt the pulse it was excited and rapid. These were the certain signs of the disease."

Whatever we may think of this as a complete clinical picture, it is certain that no such direct objective account of any disease had before this been written in England.

* John Caius: A Boke or Counseill against the Disease commonly called the Sweate. London, 1552.—John Caius: De Ephemera Britannica. Louvain, 1556.—The same, reprinted. London, 1721.

From Caius we also get some account of the date and extent of the several epidemics of the "sweat", but in this particular he is not more valuable than the lay chroniclers. Haeser, who has reprinted most of the tracts on the sweating sickness, justly places that of Caius in the first rank. I have here some tracts on the "sweat" printed in Germany,* with which it may be compared. Even in the sixteenth century Caius stands almost alone as a recorder of epidemic disease. Dr. Creighton, has, however, made the interesting discovery in the British Museum of a manuscript account in English of the sweating sickness of 1485 by a French physician, Thomas Forrestier, resident in England, and he has given extracts in his important work, the *History of Epidemics*. I have also found in the British Museum one other epidemiological record—a manuscript by a physician named Brandon, of whom little more can be discovered than that he was a medical man—which also furnishes some genuine, though scanty, contributions to epidemiology. Here we find for the first time "annual observations" of diseases, though unfortunately they are very meagre. One very remarkable observation made in the year 1579 I must quote. It is that of an epidemic gangrene—*gangrena endemica*. Brandon says that in Worcestershire and Gloucestershire, towards the end of winter, many lost their limbs by this disease. Some were affected in their hands, but more in their feet; and then he promises to give an account of the *mores et processus* of the disease, but unfortunately at this point the manuscript breaks off. The great importance of this record, however, is that we have here a definite account of what was evidently an epidemic of ergotism—a disease which has always been recognised as being very rare in England, and which has even been thought not to have been observed till the eighteenth century. Brandon also gives observations on epidemic dysentery in 1597 and on the plague of 1603 (Sloane MSS. 166). This leads me to speak of writers on the plague in general.

Literature of the Plague.

The number of publications relating to the plague in Europe during the sixteenth, seventeenth, and eighteenth

* Nuenar et Riquinus : De Novo Morbo quem Sudorem Britannicum vocant. 4to, Cologne, 1528.—Euricius Cordus, Professor in Marburg: Ein Regiment, etc., vor der newen Plage der English Schweyss genant. 4to, Nurmberg, 1529. —Joachim Schiller ab Herderen : De peste Britannicâ commentariolus vere aureus. Basel, 1531 ; 8vo.—Scriptores de Sudore Anglico. Jena, 1847.

centuries is very large, those in German being probably the most numerous, while those published in England are comparatively few. We might expect, however, that those works published at the time of great epidemics would furnish us with valuable material for epidemic history. It is very disappointing, therefore, to find how very seldom these writings, whether of Continental or English origin, have any historical value. What generally happened was this. When an epidemic broke out or was expected in any particular place, some local physician thought it his business to furnish the public with a tract on the subject, and he accordingly compiled from the best authorities a pamphlet, good or bad, as the case might be. Such a physician, if he survived, would no doubt have been able to acquire some experience of the disease during its continuance, and if he had chosen to put this down in plain words when the epidemic was over, he might have done some service to medical history; but, unfortunately, when the disease had once disappeared, the physician seemed to have lost all interest in the subject, and it is only in rare instances that the medical literature of the plague contains any account of contemporary epidemics. One exception is Guy de Chauliac's well-known account of the "Black Death" at Avignon; but we have nothing in English literature to compare at all with this till much later. The only medical work on "The Plague" in the Elizabethan times which has much value is that of Thomas Lodge, and this cannot be called original. I have brought with me a few similar publications of the seventeenth century and one of the fifteenth, but they are almost entirely destitute of originality.*

It is not till after the great plague of 1665 that we have in the well-known work of Hodges† some attempt at a scientific description of the epidemic. Hodges has so often been quoted that I need not refer to him further, but I should like to mention the name of another medical writer who has left a work on this subject, still in manuscript, in

* Valastus de Tarenta: Tractatus de Epidemiâ et Peste. Mantua, circa 1483.—Orders against the Infection of the Plague, by Queen Elizabeth. About 1590.—Proclamation regarding the Plague, by Charles I. 1641.—Directions for the Cure of the Plague and for Preventing the Infection, set downe by the Colledge of Physicians. London, 1636.—The same Directions. 1665.—Loimotomia, or the Pest Anatomised. By George Thomson. London, 1666.—A brief Treatise of the Pestilence, collected by W. Kemp, M.A. London, 1665.—A Discourse of the Plague. By Gideon Harvey, M.D. 1665.—A Plain and Easie Method for the Plague. By Thomas Willis. London, 1691.

† Loimologia, sive Pestis Narratio. Authore Nathanael Hodges. London, 1672; 8vo.

the British Museum, which deserves to be better known. When I was writing the article on "The Plague" for the *Encyclopædia Britannica* I came across this treatise by William Boghurst, a London apothecary. It is called *Loimographia, or an Experimental Relation of the Last Plague in the City of London*, by William Boghurst, Apothecary in St. Giles-in-the-Fields; London, 1666. It was evidently prepared for publication, but does not appear to have been printed. Either the printed edition has been lost, or else Boghurst did not succeed in finding a publisher. This work shows, I think, a genuine power of observation, and it has the appearance of being perfectly veracious.

Boghurst gives a view of the epidemic which does not altogether agree with that of Hodges, and which is in some respects much more rational. I have here a transcript of some of the most important chapters of the manuscript, from which I will read a few extracts.

This is Boghurst's preface to the reader:—

"Having collected a few scattered observations during my practize upon the plague which continued these eighteen months—viz., from the 7th of November 1664, to the latter end of this May last passed, 1666, and some of my acquaintance being desirous to see them, considering that none hath printed anything either since this plague, or that forty years since (which I something wonder at), for those two or three bookes printed last yeare about the middle of the plague, or a little before, as Mr. Kemp's booke and Gideon Harveye's, Mr. Garencier's, and three or four other small things spoke nothing from experience. . . . I have written nothing from hearesay or from bookes or from the testimony of others or my own conceit, but all and only from experience and triall; and I had one more advantage to doe this, being not at all fearfull, but rendering myselfe familliar to this dissease as to any other, whereas many because of their fearfullnesse came not to close practize, but stood shivering at a distance, and profited the lesse both themselves and their patients, and commonly lost their lives to boot."

The signs of the disease are thus given:—

"*Diagnosticks.*—1. Shuddering cold at first falling sicke. 2. Frequent vomitting, or at least reaching to vomitt. 3. Headache, diziness, and lightnes of the head. 4. Heat and thirstinesse. 5. Bleeding at the nose and sometymes at mouth, hemroids, and mensis. 6. Stiffnes in the necke or flanke. 7. Great inward heat and outward cold. 8. Carbuncles, buboes, blaines, blisters, spotts, rising on the body. 9. Distraction, staring frenzy, idle talk. 10. Drowsiness and sometymes continual watching. 11. A livid countenance, inclining to blacke, also a frowning countenance, etc., etc."

Here we have some of the unfavourable signs:—

"Some other more generall observations proving fatall this plague: Almost all that caught this disease with feare dyed with tokens in two or three days. About the beginning most men gott the disease with fadling, scorfetting, overheating themselves, and disorderly living. Tokens appeared not much till about the midle of June, and carbuncles not till the latter end of July, but were very rife in the fall about September and October, and seized most on the old people, adult cholerick and melancholy people, and generally on dry and leane bodyes. Children had none. If very hott weather followed a

showere of raine the disease increased much. If in the heate of the disease the winds blew very sharp and cold people dyed very quickly, many lying sicke but one day. Those that married in the heate of this disease (if they had not had the disease before) almost all fell into it in a weeke or a fortnight after it, both in city and in country, of which most dyed, especially the men."

The following observations on the spread of the disease are very interesting:—

"The winds blowing westward so long together from before Christmas until July, about seven months, was the cause the plague began first at the west end of the city, as at St. Giles, St. Martins, Westminster. Afterwards it gradually insinuated and crept downe Holborne and the Strand, and then into the city, and at last to the east end of the suburbs, soe that it was half a yeare at the west end of the city before the east end and Stepney was infected, which was about the middle of July. Southwark, being the south suburb, was infected almost as soon as the west end. The disease spread not altogether by contagion at first, nor began at only one place, and spread further and further as an eating spreading soare doth all over the body, but fell upon severall places of the city and suburbs like raine even at the first at St. Giles, St. Martin's, Chancery Lane, Southwark, Houndsditch, and some places within the city, as at Proctor's House."

The following passage gives Boghurst's view of the question of contagion:—

"Great doubting and disputing there is in the world whether the plague bee infectious or catching or not, because some think if it were infectious it would infect all, as the fire heates all it comes neare; but the plague leaves as many as it takes, thus are they gravelled at such arguments and cannot solve their doubts; and Van Helmont thinks all people catch it by feare, and generally everyone is apt to judge by his experience, for if they have beene in never soe little danger and yet have escaped without catching it they presently think the disease not infectious; and if anyone may draw his conclusion from this I have as much reason almost as any to think it is not infectious, having passed through a multitude of continual dangers cum summo vitæ periculo, being employed all day till six clocke at night, out of one house into another, dressing soares, and being alwaies in their breath and sweate without catching the disease of any, through God's protection, and soe did many nurses who were in the like danger; yet I count it to be the most subtile infectious disease of any, and that all catch it not by feare, neither (though this doth much as Helmont thinks) for their children, and confident people would not have the disease, but we see many of them also have it, and children especially most of any."

This treatise is not altogether unknown. I am glad to see that Dr. Creighton has since made good use of it in his valuable *History of Epidemics in Britain*, and has given longer extracts than I was able to do in the *Encyclopædia*. But I think it should be made known still more widely, and I take this opportunity of suggesting to this Society that to publish the whole or a great part of this treatise would be a valuable contribution to the history of epidemiology in England, and a public service well worthy of the Society. (It is No. 349, Sloane MSS.)

The Origin of Medical Statistics.

The seventeenth century, however, furnished more valuable contributions to medicine than its literature of the Plague. At this time, or at the close of the preceding century, begins a class of literature which, though humble in its origin, has developed into a valuable instrument for scientific research—I mean the science of medical statistics. These statistics, so far as England is concerned, began with what are called *The Bills of Mortality of the City of London*, which originated in a time of plague in 1592, and were first prepared for the information of the Government, being addressed by the Company of Parish Clerks to the Crown. After 1603 it became the custom to publish every week a list of the numbers of persons dying of the plague and of other diseases.* They were issued by the parish clerks in the several parishes of London, and the materials on which they were based were furnished, not by the medical profession, but by a class of old women who were specially employed to view the body and certify the cause of death in every house where a death had occurred. These records were anything but scientific, and the strange names assigned to fatal diseases, such as "Liver ground", "Rising of the lights", "Chrisomes", "Planet-struck", etc., seem very quaint to us now. Nevertheless, it is in the bills of mortality that we find the first mention of at least one disease which only later became known to the profession—viz., rickets. From the year 1634 we find deaths ascribed to this cause, though it was not till 1645 that Whistler printed his *Graduation-Thesis* at Leyden, and not till 1650 that the treatise of Glisson, generally regarded as the first on the subject (which I have here), was published.† We may therefore fairly say that the discovery of rickets was due, not to Glisson—though he first described the disease scientifically—or to any other physician, but to the old women and the parish clerks. The great importance of the bills of mortality, however, is that out of them have grown the invaluable statistics of disease which are now furnished by the Registrar-General's Department, and, in fact, the modern science of vital and medical statistics generally.‡

* London's Dreadful Visitation, or a Collection of the Bills of Mortality for this Present year. By the Company of Parish Clerks of London, etc. 1665.

† De Rachitide, sive the Rickets. By Francis Glisson, with the assistance of George Bate and Ahasuerus Regemorter. London, 1650.

‡ These records formed the basis of a book by Captain John Graunt, called "Natural and Political Observations on the Bills of Mortality", which was one

The New Fevers.

Looking again at the progress of epidemiology in the seventeenth century, we are struck with the fact that at this time various "new fevers" began to be described. I can show you several books relating to this subject by Greaves, by Whitmore,* and others. What these new fevers were is not always clear. Sometimes they look as if they were typhoid fever, sometimes typhus (though this latter is generally distinguished), and sometimes what has been called "epidemic malaria", while there were unmistakable epidemics of influenza also; but, as I am not speaking of the history of epidemics, I leave these questions untouched. Shortly after the disappearance of the Great Plague a period began in which these fevers were extremely common, both in this country and in Holland. We have a good account of one of the epidemics by Dr. Christopher Love Morley, an Englishman educated at Leyden, who describes, among others, his own case.† The impossibility of fitting in these diseases with the traditional description of tertians, quartans, and the like, undoubtedly gave great stimulus to the study of fevers, which is shown in the classical work of Morton,‡ in some chapters of Willis, and especially in the celebrated observations of Sydenham. These three great physicians may be grouped together as earnestly endeavouring to study epidemic diseases without any bias of scholastic interpretation, as if they were natural objects—as employing, in fact, what we may call the natural history method; although in other respects they were, especially Willis and Sydenham, very far apart. But as Sydenham was undoubtedly the most prominent representative of the school, and also the most influential, it will be enough if we confine our attention to him.

Sydenham, in approaching the subject of epidemics, was evidently inspired by the example of Hippocrates. Like

of the earliest, or quite the earliest, attempt at collecting vital statistics. The Third Edition, 1665, bears the *imprimatur* of the Royal Society. This was followed by the "Essays on Political Arithmetic" of Sir Wm. Petty (who is said to have collaborated in the former work); and the works of Petty are, I believe, generally admitted to have been the starting-point of the modern science which has lately been called "Demography". This fact was dwelt upon by some of the foreign visitors to the International Congress of Hygiene of London in 1891. I refer especially to Dr. Körösi of Budapest.

* Febris Anomala, or the New Disease. By H. W(hitmore). 1659.—Morbus Epidemicus Anni 1643, or the New Disease. Published by command. 4to. Oxford, 1643 [By Dr. Edward Greaves].

† De Morbo Epidemico, 1678-1679. By C. L. Morley. London, 1680.

‡ Morton: Pyretologia, sive de Morbis Universalibus Acutis. 1692.

the Father of Medicine, he gave copious records of the climatic and other conditions in connection with the prevalence of epidemics from 1661 to 1675. Unlike Hippocrates, he has not left detailed clinical reports of his patients. He attached little importance, as he himself says, to recording numerous cases. We cannot, however, but regret that this was his decision, for an adequate record of the course and symptoms of some of his individual cases of fever would have been extremely valuable, and would have enabled us to distinguish clearly—what is now sometimes difficult—the precise species of fever he was dealing with.* Sydenham's great principle in explaining epidemics was that of the *epidemic constitution* of the year. This was something independent of mere heat and cold, moisture and dryness, but due to a certain alteration of the air. While this epidemic constitution was the cause of the prevalence of one particular disease—say variola or plague—it also influenced other diseases besides the dominant one; so that when variola, for instance, was prevalent, other diseases partook of a variolous character. Notwithstanding, Sydenham never believed in one disease being changed into another. He insists very strongly on the *specific* character of diseases, which, he says, are like plants, having each its typical way of beginning, developing, and coming to an end. He himself did much towards discriminating different species of disease.

The theory of *epidemic constitution* has had many defenders, and the view that one dominant epidemic disease impresses some of its own character on other diseases has also been held in quite modern times—with regard, for instance, to diphtheria. Not very long ago the theory of a "change of type of disease" was actively discussed. I must confess to being very sceptical as to the reality of any such phenomena, but to discuss such a question now is evidently impossible. I would only throw out the hint that the existence and constancy of the laws of contagion were less clearly recognised in Sydenham's time than now, and the diagnosis of the different forms of fever was necessarily less minute, so that what was called the "epidemic constitution" might often be explained by the introduction into a particular place of some disease previously unknown there. Hirsch regards most of the epidemics of the "new fever" as due to the diffusion of an endemic malarial fever from its original seat to other

* T. Sydenham : Observationes Medicæ, circa Acutorum morborum curationem, 1676.

places where it was not habitually present. Whether this is an adequate explanation, and whether it explains the production of a new epidemic constitution in certain localities, I will not now inquire. I might remark also that the theory of epidemic constitution has quite failed to satisfy one test of a scientific law—namely, that of prediction; for no one has ever been able to foresee the occurrence of an epidemic constitution, and the only evidence for it is the actual production of an epidemic.

Epidemics and Weather.

Sydenham's observations again were imitated in those of Huxham, who for twenty-five years carried on at Plymouth most careful meteorological observations, combined with records of the prevalence or severity of diseases, which he thought to be influenced by atmospheric conditions. The same task was undertaken by Fothergill, by the younger Heberden, by Willan, and by Bateman in London down to the beginning of this century.* In reading these laborious and accurate observations one cannot help, I think, feeling a sense of disappointment. Even now it is exceedingly difficult to trace any definite relation between weather and epidemic diseases, except in so far as that cold or hot seasons naturally favour particular maladies of the respiratory or of the digestive systems respectively; but why special epidemics of cholera, of influenza, or of measles should come in one year more than another is a question on which, it must be confessed, meteorology has hitherto thrown little light.

Epidemiology in the Eighteenth Century.

At the beginning of the eighteenth century the study of epidemiology showed a distinct revival. Perhaps one indication of this was the publication by Freind of *Hippocrates on Epidemics*, to which I have already referred. But in 1720 the outbreak of plague in Marseilles and Southern France sent a panic through Europe, and led in England to the publication of a new literature on the subject. First came Mead's well-known pamphlet *On Pestilential Con-*

* John Fothergill : On the Weather and Diseases of London ; Works, vol. i, 1783 ; 8vo.—William Heberden, Junior : On the Increase and Decrease of Diseases, particularly the Plague. London, 1801 ; 4to. — Robert Willan : Reports on the Diseases in London, particularly from 1796 to 1800. London 1801 ; 12mo.—Thomas Bateman : Reports on the Diseases of London and the State of the Weather, from 1804 to 1816. London, 1819 ; 8vo.

tagion,* written at the request of the Secretary of State, Craggs, in which he advocated strict quarantine regulations, afterwards authorised, but never actually carried out. Mead's work is, of course, not based on experience, and has no merit except the clearness of the style. It went through six editions before the end of the year. (I show you the first edition.) Naturally it called forth replies: among others one by Dr. John Pringle,† in which he entirely denied the efficacy of quarantines. Old tracts from the time of the Great Plague were looked up and reprinted‡; while Caius's Latin tract on the sweating sickness again saw the light, being edited probably by Jebb.§ But the excitement soon died away, and left no permanent mark on English medical literature.

The middle of the eighteenth century, which has been regarded as a period almost of stagnation in the progress of internal medicine, was nevertheless not without influence on epidemiology. It is true that little advance was made in the science of medicine, and few brilliant discoveries are associated with this period—at least until the last quarter of the century; but through the whole of the period, in which Mead, Heberden, Pringle, and Fothergill are among the most conspicuous names, great advance was made in the detailed knowledge of individual diseases. Now it is this knowledge of individual diseases which alone makes accurate diagnosis and discrimination possible. It is quite indispensable to a knowledge of epidemics, and, looking back over the whole period we have traversed, it is fair to say that a want of this detailed knowledge was the cause of the failure of all the earlier attempts, including those of Sydenham, at constructing a science of epidemics. Even in this century the old confusion between typhus fever, typhoid fever, and relapsing fever made it impossible to establish any coherent laws of the incidence and frequency of these diseases. It is only since they have been discriminated that we have been able to trace the influences which have made one or other of these fevers prevalent at any particular time or place. The lesson to be drawn is that epidemiology can only be founded on a basis of accurate clinical medicine.

The one most important event in the epidemiology of the

* Mead: Short Discourse concerning Pestilential Contagion. First edition London, 1720; 8vo.

† Inquiry into the Nature of the Plague. By J. Pringle. London, 1722; 12mo.

‡ Collection of Valuable and Scarce Pieces on the last Plague of 1665. London, 1721; 8vo.

§ See Note, page 7.

eighteenth century is beyond dispute Jenner's great discovery of vaccination; but the history and literature of this subject have been so often treated that I will here content myself with this brief mention and humble tribute. There are, however, two other branches in which the eighteenth century made important contributions to the science of epidemiology. The first is associated with the name of Sir John Pringle. This distinguished man was an army practitioner, and may be said to have been the first who systematically studied the medical aspect of army diseases as distinguished from the surgical. His classical work, *Observations on the Diseases of the Army,* published in 1761, was the starting-point of all modern improvements in military hygiene. I mention him with the greater pleasure because medical officers of the army have by following in the footsteps of Pringle, made so many valuable contributions to the work of this Society. Sir Gilbert Blane rendered corresponding, and perhaps equal, services to the hygiene of the navy; but his medical observations were less important. The second branch of epidemiology, which began in the eighteenth century, was that of the study of foreign diseases. Considering the complexity of our relations with so many foreign countries, through the army, through the navy, through colonisation, travel, and so forth, it is not surprising that English, medical writers should have contributed so largely to this branch of medicine, though the earliest, and for a long time the only, workers in this field were the Dutch physicians. Among the earliest British workers I would mention the names of James Lind, who wrote on the Remittent Fever of Bengal (Edinburgh, 1768), on other Diseases of Hot Climates, on Scurvy, and similar subjects, and Patrick Russell, whose observations on the plague and other diseases at Aleppo were published in 1791.

In the present century knowledge of such diseases has been greatly extended, and observations of this kind have formed a most valuable branch of the work of our Society. It is to those members of our profession who have gained experience either in military or civil practice in India that we owe a large part of these observations.

Epidemiology in Modern Times.

If I were to attempt to sketch, even briefly, the progress of epidemiological science within the present century, I should not only be recounting much that is known to

many of you much better than it is to myself, but I should also go far beyond the bounds of an address like the present. Looking at the relation of our branch of medicine to others, one cannot but be struck with the fact of the extremely wide field which the work of this Society covers. We touch clinical medicine on the one hand and statistical science on the other. We have close relations to geography and to history. We make use of the work of the traveller, the missionary, and even the sportsman, as well as that of the chemist and the physiologist. Part of our material is derived from the laboratory, and another part from external nature in the widest sense. Our progress is, moreover, intimately connected with the progress of numerous detailed branches of medical and of extra-medical science. It is no wonder, then, if the progress of epidemiology has been slow and interrupted; but still it does seem remarkable, and not altogether creditable, that the broad outline sketched by Hippocrates more than two thousand years ago should have waited so long to be filled up in proper colour and in adequate detail.