

THE LAST EPIDEMIC OF PLAGUE IN ENGLAND?

SUFFOLK 1906–1918

by

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APART from a single case of plague contracted in a laboratory at Porton in 1962 the last English outbreak of plague occurred in Suffolk. There were several official reports published soon after and there have been a number of short accounts based on these reports.

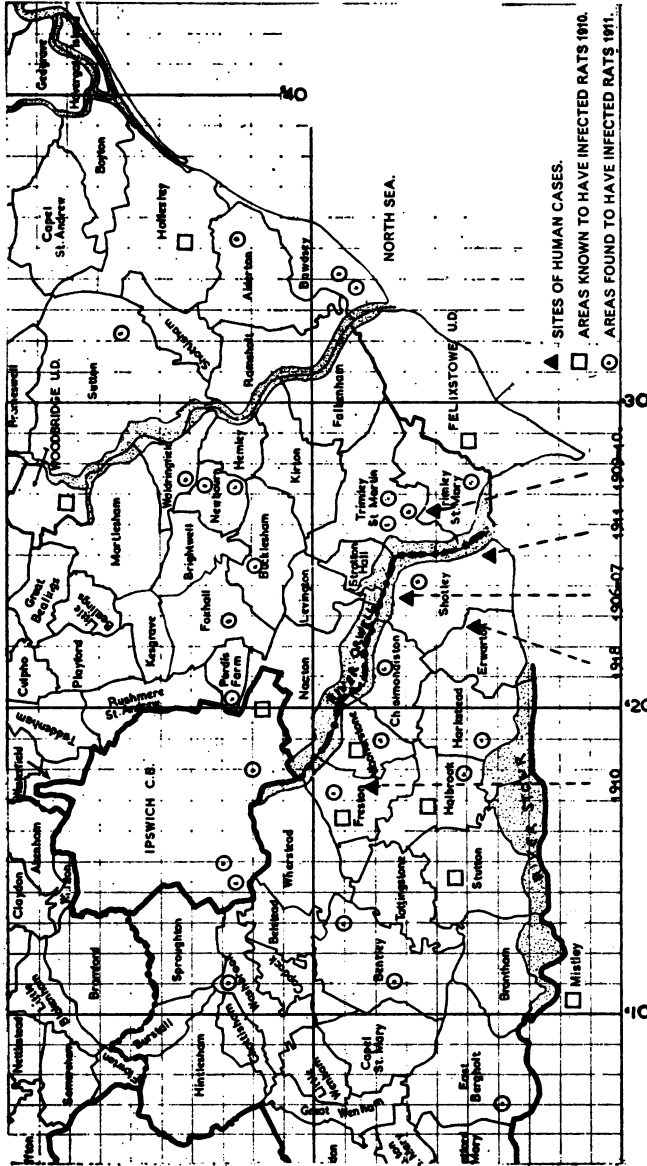
This account of the epidemic was compiled with the aid of contemporary sources such as newspapers, letters, minutes of committees and coroner's depositions, together with information from one of the survivors, from several near relatives of the victims, as well as from official reports. In particular the author was fortunate in discovering a collection of letters, telegrams and other documents belonging to the late Dr. H. P. Sleigh, who was Medical Officer of Health of the Rural District of Samford at the time.

THE DIAGNOSIS OF PLAGUE

Five miles south of Ipswich, about halfway between the villages of Freston and Holbrook lies a small group of cottages called Latimer Cottages (see Map and Photograph). At the time that plague was first diagnosed this building was divided into three homes. In the middle cottage lived a farmworker, Mr. Chapman, his wife and four of his wife's children of a former marriage.

On Tuesday, 13 September 1910, the third of these children, Annie Goodall, aged nine, was taken ill. She had not been away from home since 4 September. Following a bout of vomiting she ran a high temperature. She was seen by Dr. Carey on the following day when her temperature was 105°F, but apart from her general toxæmia he could detect no physical signs. She became delirious during that night and by the following morning was drowsy. Dr. Carey then found bronchial breathing at the base of one lung. Her cough became more severe and she developed diarrhoea and vomiting. She died on 16 September and was buried on 20 September.

The day after the funeral (21st) her mother was taken ill. She rose as usual but later complained of headache and nausea. The next day she was seen by Dr. Carey, who found her temperature to be 105°F, her respirations rapid, and crepitations at the base of both lungs. During that night she suffered with diarrhoea and vomiting. The following day (23rd) Dr. Carey found her to be dying. He invited Dr. Herbert Brown, a physician in Ipswich, to visit the patient. Dr. Brown arrived at noon but the patient had already died. Dr. Brown collected some brownish sputum which he took to the local bacteriologist, Dr. Llewellyn Heath. Only pneumococci and gram-negative diplobacilli were grown from this specimen.



Map of South East Suffolk showing sites where human cases of Plague occurred and areas where infected rats were found. (figures of National Grid)

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Three days later (26 September) Mr. Chapman, the husband of the last patient and Mrs. Parker a near neighbour from Turkey Farm, who had nursed Mrs. Chapman, both fell ill. The next day Dr. Carey again requested Dr. Brown to visit. As Dr. Brown was unable to go himself he asked Dr. Heath to go instead. Dr. Heath took a blood sample from Mr. Chapman's ear. On the 28th Dr. Brown visited the patients in consultation with Dr. Carey and Dr. H. P. Sleigh, the Medical Officer of Health of the district. Dr. Brown collected a syringeful of blood from Mr. Chapman's basilic vein and also obtained some bloodstained fluid by puncturing Mrs. Parker's pneumonic lung. From these two specimens Dr. Heath grew bacilli which he identified as *Pasteurella pestis*. Both these last two patients had high temperatures and signs in the lungs, Mr. Chapman having scattered rales over both bases and Mrs. Parker having pneumonic consolidation. Both patients remained rational until a few minutes before death on Thursday, 29 September.

In a letter to Dr. Sleigh on 30 September Dr. Heath stated that he had first isolated plague bacilli on the evening of Thursday, 29 September, in the specimen of blood that he had collected on the 27th. He confirmed this finding on the 30th in the specimens taken by Dr. Brown on the 28th. He immediately informed Dr. Brown of the diagnosis then journeyed to Cambridge to see Professor Sims Woodhead. He wrote in the letter 'I thought it better to have a big name at the back of me if necessary'. At 5.41 p.m. Dr. Heath wired to Dr. Sleigh, 'Professor Woodhead agrees with my diagnosis. Isolate all contacts—writing—Llewellyn Heath'. In the meantime Dr. Brown had met Dr. Sleigh at 2 p.m. and warned him of the probable diagnosis.

The isolation accommodation was at the Workhouse in Tattingsstone and only opened when required. The contacts could not be moved into this until the following day (1 October). It was on this day, also, that Dr. Sleigh notified the diagnosis to the Local Government Board. The two patients had both been buried on 30 September. The vicar conducted the whole service in the open air and all those attending the funeral had their clothes disinfected.

On Monday, 3 October, the Local Government Board Inspector, Dr. Timbrell Bulstrode, wired to Dr. Sleigh that he would visit on the following day. It is not clear what Dr. Bulstrode did on this visit to Samford, except that he arranged for the bacteriological specimens which had been taken to Professor Sims Woodhead to be submitted to the Board's own Bacteriological Adviser, Dr. Klein, of the Lister Institute. On Saturday, 8 October, the Principal Medical Officer of the Local Government Board wired to Dr. Sleigh 'Dr. Klein's examination of material from Professor Woodhead's Laboratory is entirely negative for pestis. Letter follows.' Dr. Newsholme's letter confirming this finding gives the impression that the episode was now over. His last paragraph reads 'May I take this opportunity of congratulating you on the promptitude with which you dealt with this unfortunate outbreak?''* Dr. Bulstrode wrote on 9 October also confirming Dr. Klein's results. He announced that he would be returning to Suffolk. He also acknowledged receipt of a rat that

* Dr. Sleigh must have complained about this letter and the query at the end of it; because there is a handwritten letter from Dr. Newsholme 'Dear Sir, Your letter is written under a total misapprehension. My statement was intended as a compliment for good work and clearly can mean nothing else. The demands of English Composition required the ?.'

had been caught near Freston and had died after capture. This rat had been forwarded to Dr. Klein.

On 12 October this rat and a hare which had been shot near Freston were both found by Dr. Klein to be infected with *Pasteurella pestis*. Twelve days had elapsed between the original diagnosis and the confirmation of plague by the Local Government Board. Shortly after other rodents from that parish and surrounding areas were found to be infected. It was soon reported that an infected hare had been found at Mistley in North Essex, and a rat at Edwardstone in West Suffolk.† There were also reports of an infected ferret in Woodbridge and a cat dying of plague in Stutton. The Samford Rural District Council heard on 20 October that the disease had come from rats. They agreed to the distribution of handbills advising people to avoid touching dead rats, rabbits or hares. It was also decided to persuade farmers to try and kill all rats, provided that the Council itself did not pay for the poison.

Dr. Bulstrode returned to Suffolk as soon as the disease was confirmed and concentrated his attention on two aspects of the problem. He sought evidence of possible earlier cases of plague in human beings and he organised schemes for rat destruction.

PREVIOUS CASES OF PLAGUE

Dr. Bulstrode found evidence of two previous outbreaks of infectious disease which, after investigation, he accepted as being plague.

The first of these outbreaks had occurred in December 1906 and January 1907. A few miles from Latimer Cottages near the River Orwell lies Charity Farm with its attendant cottages. There is no contemporary account of this outbreak, although there is a note that it was discussed at a meeting of the Samford Rural District Council. The earliest published account is in the *East Anglian Daily Times* of 6 October 1910. The first patient was a Mrs. Church, who lived in Charity Farm Cottages; she developed pneumonia on 9 December and died three days later. She was nursed by her daughter, Mrs. Radcliffe, who lived in a detached cottage near the farm. This daughter developed the disease on 17 December and died on the 19th. Another daughter fell ill on 20 December but finally recovered. These last two patients were nursed by Mrs. Goodchild, who lived in Brickhouse Terrace, a row of cottages about half a mile away. Mrs. Goodchild, her husband and her two sons then developed the disease in succession. Mrs. Goodchild's mother, Mrs. Woods, came from Saxmundham to nurse her son-in-law and two grandsons. She was the last to contract the disease and died on 6 January. The sequence of events is given in the Table. All the deaths were registered as being due to acute pneumonia. Dr. Carey who later attended the patients at Latimer Cottages, was in attendance on all these patients. Charity Farm Cottages command a good view of Butterman's Bay in the River Orwell.

The other outbreak investigated and accepted as plague by Dr. Bulstrode presented as a different clinical picture. This had occurred to the north of the River Orwell, near its mouth, in the parish of Trimley. In a small and overcrowded cottage seven members of the Rouse family had been taken ill during December 1909 and January

† This may have been an error. It was reported in the local paper and is the only report of the infection getting into West Suffolk.



Figure 1
Latimer Cottages, Freston, where Plague was first diagnosed in 1910.

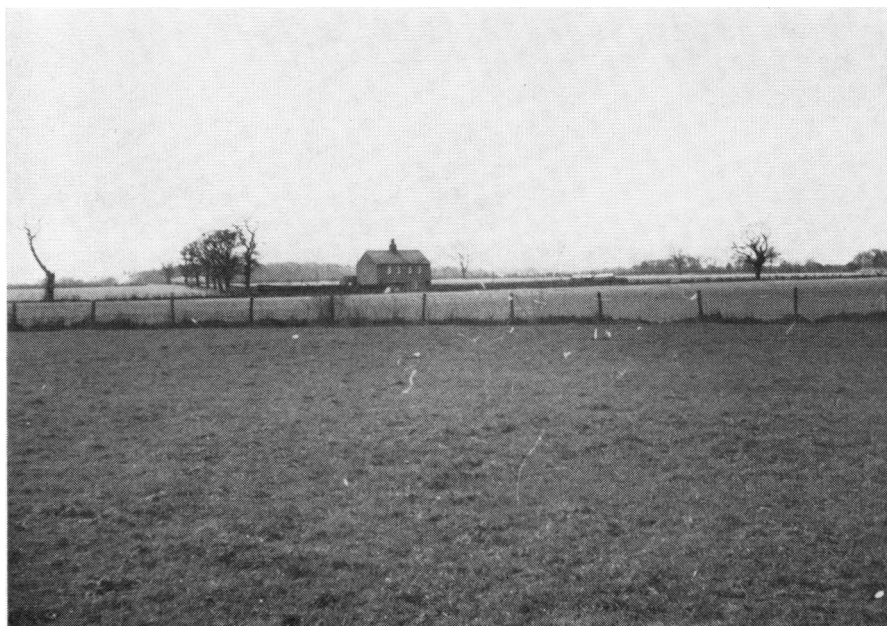


Figure 2
Warren Lane Cottages, Erwarton, where the last two cases of Plague occurred in 1918.
The photograph illustrates the isolation of the cottages.

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TABLE OF HUMAN CASES OF PLAGUE IN SUFFOLK

Name	Age	Sex	Year	Date of onset	Date of death	Bubonic or Pneumonic	Location
Mrs. Church	53	F	1906	Dec. 9	Dec. 12	P	Charity Farm Cottages, Shotley
Mrs. Radcliffe	24	F	1906	Dec. 17	Dec. 19	P	" " " "
Miss E. Church	19	F	1906	Dec. 20	Recovered	P	" " " "
Mrs. Goodchild	46	F	1906	Dec. 24	Dec. 26	P	Brickhill Terrace Cottages, Shotley
Mr. Goodchild	56	M	1906	Dec. 28	Jan. 2	P	" " " "
Mr. H. Goodchild	?	M	1906	Dec. 27	Recovered	P	" " " "
Mr. R. Goodchild	7	M	1906	Dec. 30	Jan. 4	P	" " " "
Mrs. Woods	66	F	1907	Jan. 3	Jan. 6	P	" " " "
Mrs. Rouse	46	F	1909	Dec. 19	Dec. 22	B	Lower Street, Trimley
Miss C. Rouse	14	F	1909	Dec. 26	Jan. 5	B	" " " "
Miss A. Rouse	9	F	1910	Jan. 8	Jan. 10	B	" " " "
Mr. Rouse	50	M	1910	Jan. 9	Recovered	B	" " " "
Mr. W. Rouse	12	M	1910	Jan. 15	Jan. 17	B	" " " "
Mr. J. Rouse	6	M	1910	Jan. 18	Recovered	B	" " " "
Miss H. Rouse	18	F	1910	Jan. 20	Recovered	B	" " " "
Miss A. Goodall	9	F	1910	Sept. 12	Sept. 16	P	Latimer Cottages, Freston
Mrs. Chapman	40	F	1910	Sept. 21	Sept. 23	P	" " " "
Mr. Chapman	57	M	1910	Sept. 26	Sept. 29	P	" " " "
Mrs. Parker	43	F	1910	Sept. 26	Sept. 29	P	Turkey Farm, Freston
W. E. Buck	20?	M	1911	Oct. 10	Recovered	B	Naval Barracks, Shotley
Mrs. Bugg	52	F	1918	June 8	June 13	P	Warren Lane Cottages, Erwarton
Mrs. Garrod	42	F	1918	June 16	June 19	P	" " " "

1910. The illness had been so sudden and dramatic that Dr. Hart had wondered if the patients could have been poisoned. As a result an inquest was held on one of the patients. One of the three survivors, Honora Rouse, aged eighteen, made a statement which gives an excellent contemporary account.

I am a single woman and since last summer have been living with my parents at Lower Street, Trimley St. Martin. There was my father and mother, myself and two sisters, Carrie and Alice, and two boys, Willie and John. On Sunday December 19th my mother had a headache when she awoke. She got up about 10 o'clock and was sick. She had sickness and diarrhoea and got worse and on Wednesday 22nd she went to bed about 4.30 p.m.—I went upstairs with her and helped her into bed. I went downstairs and at about 5 p.m. I went up again and found she was dead. . . . On Sunday* my sister Carrie turned up ill, and she and Willie were both full of sores, and Carrie had a knot on her neck. My mother had a knot on her neck while she was ill. Dr. Hart was sent for on 2nd January, he came and attended to her and she died on 5th January. She was buried on the 8th January and on this day Alice fell ill. She was ill in the same way as the others, and had a knot and she died on the 10th January. My father also fell ill on the 8th January. He was sick and had diarrhoea like the others but had a knot swell up on his thigh. He was removed to Ipswich Hospital on the 10th January. On the 11th January my two brothers, Willie and John, were taken to Barham Workhouse. On the Sunday following I heard that Willie was ill and I went to Barham and saw him. He had the same symptoms as the others and had a knot on his neck. He died on the 17th January—On the 22nd January I fell ill and went to the hospital and remained there till the 3rd February. I was ill in the same way as the others and had spots on my legs and also a knot inside my thigh and my face and arms were swollen. My brother John was also taken to the hospital and is still there (5th February).

* In the deposition the Coroner has written January and an indecipherable date—but this was presumably an error as the date given for Carrie's illness in Dr. Bulstrode's report was 28 December and this has recently been confirmed in a letter to the author from Mrs. Honora Hubbard, née Rouse.

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Mr. Rouse had his swelling in the groin incised but no pus was found. John Rouse was admitted to Hospital on 18 February with headache and drowsiness. He recovered and was discharged on 9 March. Honora Rouse's swelling in the groin apparently discharged spontaneously. Miss Honora Rouse, now Mrs. Hubbard, is still alive and so is her younger brother John.

Dr. Bulstrode investigated another possible case near Trimley and accepted it with some doubts. Honora Rouse had visited her sick brother at Barham on 16 January. On her way home her horse met with an accident and she was taken in by the Foster family in Nacton. She stayed there until 22 January when she was taken ill and removed to hospital. On 3 February, Hylda Foster, aged seven, complained of severe abdominal pain. By 5 February the child was severely ill and on the following day she was admitted to hospital for an exploratory laparotomy. Many swollen abdominal glands were discovered at this operation and this finding convinced the surgeon that the disease was similar to that of the Rouse family.

The post-mortem report showed the child had an acute peritonitis with an abscess in the pouch of Douglas. This fact, taken together with the period of twelve days between the contact with Honora Rouse and the onset of symptoms, makes the diagnosis of plague unlikely. It seems more likely that the child had an acute dysentery with a perforation.

ACTION AGAINST RATS 1910–1911

Dr. Bulstrode persuaded local authorities that it was essential to destroy rats and to avoid leaving garbage that might supply food for rats. A Joint Committee was formed by the Ipswich County Borough and Samford R.D. Committees for these purposes. Rat-catchers were appointed and eventually Samford Committee agreed to the distribution of free rat poison.

East Suffolk had never had a County Medical Officer of Health. As the result of the plague the Council decided to appoint Dr. Llewellyn Heath, the bacteriologist, to act in this capacity temporarily from 1 November 1910. Dr. Heath requested all District Medical Officers of Health to survey their areas for rats and to destroy them. He wrote to all doctors in the area enlisting their aid. He requested the police to report on mortality amongst rats. He distributed warning notices to the public and arranged for four nurses to be immunized against plague for work anywhere in the county. On 10 November the Local Government Board issued an order under the Public Health Act 1875 making it obligatory for Local Authorities to report all cases of rat plague and to destroy rats. Early in December infected rats were found to be limited to Samford and Woodbridge Districts. This had to be confirmed by a systematic survey. This survey was started on 14 January 1911. Dr. Bulstrode* assisted by Drs. Fletcher and Reece, of the Local Government Board Inspectorate, arranged the destruction and collection of rats while Drs. Petrie and Macalister of the Lister Institute examined the rats in a Laboratory loaned by Dr. Pringle, the Ipswich Medical Officer of Health. They examined 6,071 rats from 22 urban districts and 301 parishes. They failed to find any evidence of plague.

* Dr. H. T. Bulstrode died suddenly on 21 July 1911, aged fifty-two. He was buried at Wherstead in Suffolk, where the rector was his father-in-law. There is a tradition in Suffolk that he died of the plague but it has no foundation in fact.

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In the meantime work was done on the identification of rat fleas. Drs. Martin and Rowland, who had both been with the Plague Commission in India, spent two periods in Suffolk, 8 November to 22 November, and 27 December for a period of six days. From 568 rats they recovered 584 fleas. 324 were *Ceratophyllus fasciatus* and 259 were *Ctenophthalmus agyrtes*—only the former bites man readily. The number of man-biting fleas per rat was considerably less than had been found in areas with bubonic plague in India. During this work seventeen of the rats examined for fleas were found to be infected with plague. A further three infected rats were found at Hollesley in December, together with two out of forty rabbits. Only two man-biting fleas were found on these rabbits. No black rats were found in the rural districts of Suffolk during this period although one such rat was found in Ipswich.

Although this first survey for infected rats had been unsuccessful a further systematic hunt for rats was considered advisable. July was chosen as the starting month as rat plague outbreaks tend to expand to epizootics early in the autumn. The Local Government Board ordered the survey from July to October. Rat-catchers were employed throughout the area and the police agreed to act as agents for the collecting, labelling and forwarding of rats to a laboratory in Ipswich. All rats were dissected by Drs. G. H. Macalister and R. St. John Brooks. If there was disease of the liver, spleen or other tissues the material was forwarded to the Board's laboratory for diagnosis. Drs. A. Eastwood and F. Griffith did the bacteriology with Dr. Klein acting as consultant.

As soon as a case of rat plague was diagnosed no further dead rats were collected from the parish concerned. The discovery of one infected pocket was accepted as evidence that the whole parish was involved. Investigations were extended to surrounding parishes until the limit of the infected area was defined. 15,332 rats were dissected, 35 rats were found to be plague infected in 27 different areas (shown on the map). The opportunity was taken to examine the rat fleas again. Professor C. Strickland and G. Merriman of Cambridge University did this work. They found an average of four fleas per rat (variation 0.6 to 6.5). Fifteen species of flea were discovered but only two of these occurred in any numbers. 1,986 *Ceratophyllus fasciatus* were found (60 per cent) and 1,257 *Ctenophthalmus agyrtes* (38 per cent). There was a decline in the number of fleas in the cooler weather.

LATER CASES OF PLAGUE

On 10 October 1911, as the survey for infected rats was ending, a sailor was admitted to the sick quarters of the Royal Naval Barracks at Shotley. He had never been abroad and had spent the past year at Shotley. He had general malaise, temperature of 104°F, headache and pains in the back and legs. He had a small cut on the left index finger and a painful lump in the axilla. This cut had occurred on 7 October while he was cleaning a rabbit. He had caught the rabbit on the Ipswich Road less than a mile from the Latimer Cottages, Freston. His condition was unchanged until 13 October when he had a haemoptysis. The axillary lump had increased and on the 15th it was incised but no pus was found. He then developed a severe pneumonia. Examination of the sputum suggested the diagnosis of plague and the patient was isolated until the diagnosis could be confirmed. The patient developed severe bilateral

iritis. Paracentesis of the right eye failed to find pus. His general condition deteriorated and he was treated with oxygen, strychnine, brandy and an autogenous vaccine. The diagnosis was confirmed by Officers of the Local Government Board. For twelve weeks the patient ran a high remittent fever. During this period he developed abscesses in the neck which were incised, an empyema, which was aspirated, and albuminuria. This sailor was finally declared free of infection on 14 January 1912. He had survived the plague but 'was in an extremely helpless condition, partly owing to the fact that he made no effort to compete with the handicap of practically complete blindness'. Although he never regained his sight he lived to reach the age of seventy-six.

There were no further cases of plague for the next seven years. Then two further cases occurred.

A Mrs. Bugg who was living in a semi-detached cottage in Warren Lane Cottages, Erwarton, about a mile from Shotley barracks, did her baking as usual on Saturday morning, 8 June 1918. In the afternoon she developed a chill and retired to bed. She developed a pneumonia and died on the following Thursday. The cottages are at least a quarter of a mile from the road and further than that from the nearest house. They are about one mile from both the River Stour and the River Orwell (see map). Mrs. Bugg was visited by Mrs. Garrod, her next-door neighbour. Mrs. Garrod became ill on Sunday 16 June. After tea she felt faint, and on the following day was decidedly ill. She was seen by Dr. Carey on the Tuesday when her temperature was 102°F, her pulse and respiration rapid and she was spitting blood. Dr. Carey diagnosed lobar pneumonia but he had attended the earlier cases of plague and was suspicious that this might be another case. Accordingly he invited Captain Cade, R.A.M.C., the bacteriologist to the Eastern Command to visit and to examine the sputum. The diagnosis of plague was confirmed. The patient died on 19 June 1918. Once again the contacts of the two patients were removed to Tattlingstone Workhouse while all their clothing and bedclothes were burnt. There were no further cases of plague in Suffolk.

ACTION AGAINST RATS 1912 AND LATER

The evidence had shown that parishes on both sides of the River Orwell harboured rats infected with *Bacillus pestis*. In these districts measures were taken for the destruction of rats. Professional rat-catchers were employed, and other persons bringing in dead rats were paid twopence a tail. All refuse was carefully removed or burnt. During 1912 nearly a quarter of a million rats were killed in the relevant area and no case of plague infection was discovered. A permanent bacteriological laboratory was built to serve the County of East Suffolk. It continued to do the County work until it became part of the Public Health Laboratory Service.

In 1913 two parishes in the Samford District and one in the Woodbridge area were found to harbour infected rats. Ferrets were found to be infected in the Woodbridge District (seven cases). There were five further cases of infected animals in 1914 (four rats and one rabbit).

The outbreak of war prevented further investigations by the Local Government Board. In response to the wishes of the Military Authorities the County Council opened a special laboratory for the examination of rats. After examining 9,691 rats

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with negative results the laboratory was closed. It was then left to doctors to send specimens to the laboratory of any persons suffering with acute pulmonary disease. In this way the last two cases of human plague were diagnosed in 1918. No infected rats were discovered after 1914.

SOURCE OF INFECTION

Dr. Bulstrode investigated two theories. He considered that the most likely source was infected rats coming ashore from grain ships in the River Orwell. Many such ships used to anchor in Butterman's Bay in the river about one and a half miles from Latimer Cottages and only half a mile from Charity Farm. During 1910, 631,585 quarters of grain were imported via the River Orwell. Ships arrived from San Francisco, San Nicolas, Valparaiso, Rosario and Alexandria. In each of these ports there were cases of plague in the period 1907–1911.

The other theory investigated was that the plague had come on the barges that came from London River. Grain and vegetables grown in Samford were shipped by barge to London and horse manure was brought back from the stables and streets of the Metropolis.* Dr. Bulstrode could find no evidence to support this theory as no case of plague was found amongst rats in the London area.

COMMENT

The third pandemic of plague had spread from China to Hong Kong in 1894 and from there to many parts of the world. Plague had reached Glasgow in 1900. As a result the Local Government Board had made the disease notifiable. Dr. W. H. Power, the principal medical officer at the time had written an excellent memorandum on the subject. A copy of this memorandum and the Board's regulations were sent to Dr. Sleigh when he notified the Samford cases in 1910.

The plague in rural Suffolk, however, had not behaved like the severe epidemics of the past as the authorities feared, but was like the type that exists in many remote areas of the world. This type has been called sylvatic or wild rodent plague. The disease is enzootic amongst the prevailing wild rodents of the area and only occasionally infects human beings. When it does infect man it tends to affect individuals or single households and according to Hirst it tends to be pneumonic rather than bubonic.

The Local Government Board had obviously found it hard to believe that four cases of acute pneumonia in a remote rural cottage some miles from the nearest port could be the plague. When the findings of the local bacteriologist were not confirmed by Dr. Klein they must have doubted the original diagnosis. Dr. Newsholme's immediate reaction as shown by his letter to Dr. Sleigh was that the incident was of no real concern. The finding of the epizootic amongst the rats had raised fears of severe epidemics and in the next few years great efforts had been made to exterminate the rats. It was not until 1918 that the Medical Officer of Health of East Suffolk had come to realize the true epidemiology when he warned his committee that there was the possibility of occasional localized outbreaks of plague in human beings.

Of the twenty-three possible cases of human plague in Suffolk only four were

* This theory is still quoted in Suffolk as being responsible for the plague.

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confirmed bacteriologically (Mr. Chapman and Mrs. Parker at Freston; the sailor at Shotley, and Mrs. Garrod at Erwarton). There can be little doubt that the other two cases at Latimer Cottages and Mrs. Bugg at Erwarton also had the disease. The outbreaks at Shotley and Trimley had both been characterized as being highly infectious with a short incubation period and a high mortality. The disease pattern was pneumonic at Shotley and largely glandular at Trimley but both episodes seem entirely compatible with the diagnosis of plague. The possible exception is the case of Hylda Foster where the evidence seems to point to an acute gastro-enteritis with perforation as the cause of death.

The question arises from a historical viewpoint whether this outbreak of plague was simply a unique and curious episode or whether it was a demonstration of how plague behaves in rural England. From the fourteenth century to the seventeenth century plague was endemic in England and its recurring epidemics can be traced in the towns in burial registers and bills of mortality. It would be impossible for the historian to detect plague in rural areas if it had behaved as it did in Samford from 1906–1918. It was only the opening of a bacteriological laboratory at the Ipswich Hospital early in 1910 that allowed this twentieth-century epidemic to be diagnosed. The two small outbreaks that had occurred before that time were not diagnosed by contemporary means. Although the diagnosis seems reasonable now, there is no way of confirming it.

Circumstances in rural Suffolk in the early years of this century had not altered much from the seventeenth century. Latimer Cottages were supplied with well and pond water, candles and a bucket privy. Travel to Ipswich was on foot or by the twice-weekly carrier's cart. Food was bought locally. Only clothing and household goods had to be fetched from the local town. The farm cottages being of brick may have been of sounder construction than those of earlier centuries.

A doubtful difference concerns the rural rat population. In an attempt to explain the disappearance of plague in the late seventeenth century historians have cited the replacement of the black rat by the brown rat as a possible cause. However, the brown rat is just as capable of contracting and spreading the plague as the black rat, and in the Suffolk epidemic all the rats infected with plague were in fact of the brown variety. Rabbits, hares, ferrets, dogs and cats were also involved to a slight extent. In wild rodent plague, which occurs in many parts of the world, the actual species of wild rodent does not seem to matter, the epidemiology of the disease seems to follow the same pattern (Hirst). It is suggested, therefore, that this curious epidemic in Suffolk may be the model for plague in rural England during past centuries.

ACKNOWLEDGEMENTS

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- Personal communications from:
- Mrs. S. Bailey, whose brother, W. E. Buck, was the sailor who survived the plague at Shotley.
 - G. Baker whose family occupied Latimer Cottages after the outbreak and who lives at Turkey Farm, Holbrook.
 - E. J. Booty, an officer in the Town Clerk's Department, Ipswich, 1909–10.
 - G. Brooke, whose aunt, Miss M. Blyth, nursed the plague cases at Freston.
 - H. Dickson, who was serving at the Naval Barracks at Shotley in 1911.
 - Mrs. E. Godward (née Goodall), sister of the original case at Freston and a household contact.
 - Mrs. H. Hubbard (née Rouse), a survivor of the Trimley outbreak.
 - Mrs. V. Lewis and Mrs. E. Webb, children of Mrs. Bugg who died at Warren Lane Cottages, Edwarton.
 - Mr. E. Parker and Mrs. Lummis, children of Mrs. Parker who died at Turkey Farm.
 - Mrs. M. V. Simpson, who lived in Freston in 1910 and went to school with Annie Goodall.
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