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AN EPIDEMIC OF THE GASTRO-INTESTINAL TYPE OF
INFLUENZA IN PORT LINCOLN, SOUTH AUSTRALIA.
1905 - 1906.

A T H E S I S.

presented to the UNIVERSITY of EDINBURGH
for the degree of
Doctor of Medicine.

by

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AN EPIDEMIC OF THE GASTRO-INTESTINAL TYPE OF
INFLUENZA IN PORT LINCOLN STH. AUSTRALIA 1905-
1906.

The occurrence of an Epidemic of Influenza where the cases exhibited, practically and solely, symptoms characteristic of one variety of the disease in question, has seemed to me to be worthy of being brought before the notice of others, and I have embodied my experience in the form of a thesis for the degree of M.D. in my University.

I propose to place on record the symptoms and characters of the disease as met with at the bedside and then to endeavour to bring my observations into line with experiences already published in the literature.

I may state that I met with this epidemic while acting as Assistant in the private practice of Dr. Edward Kimmont of Port Lincoln, South Australia. The fact, that the cases were private ones, proved a great obstacle to the making of various scientific investigations, which would have been interesting and perhaps profitable; at the same time my clinical observations/

observations were made with care, and the diagnosis was verified by consultation in quite a number of the cases.

GEOGRAPHY OF PORT LINCOLN.

Port Lincoln is a small sea-port town containing about 1,000 inhabitants within its boundaries and perhaps between 500 and 1,000 in surrounding agricultural districts. It is situated in a very southerly part of the East Coast of Eyres Peninsula on Spenser's Gulf Sth. Australia.

The only communication with the town, from the nearest City Adelaide, is by steamer twice weekly, there being no railway, and the distance from the Capital of South Australia to Port Lincoln is 165 miles by sea.

My Principal and I had been warned by a medical friend in Adelaide to be on the look out for Gastro-Intestinal Influenza, as it was very prevalent in his city.

In less than a fortnight after receipt of his warning, the epidemic was upon us, and my first case/

case was absolutely the worst of the ninety which I treated in and around Port Lincoln between December 6th 1905, when this case occurred, and April 1906. It was almost immediately followed by others, fresh cases requiring attention every day.

HISTORY OF THE DISEASE.

The present was the first occasion on which the Gastro-Intestinal variety had occurred in Port Lincoln, and indeed, so far as I could learn, the first season it had appeared in Australia, though the ordinary Pulmonary Catarrhal form had long been known all over Australia.

DURATION OF EPIDEMIC.

The epidemic commenced on December 6th 1905 and continued up till the middle of April 1906.

By the end of April the last of the disease had been seen for that year.

ETIOLOGY/

ETIOLOGY.

The disease is readily communicable from one person to another. In most houses where one person was infected those in attendance got it, though as a rule in a milder form than the original patient.

In a number of cases, I examined the vomit which possessed a thick glairy mucous appearance (the patients described it as slimy). It had no particularly disagreeable odour, but tended to adhere somewhat to the receptacle. Samples were collected to endeavour to discover the presence of Pfeiffer's Bacillus.

METHOD EMPLOYED TO DISCOVER BACILLUS.

A sample was selected, placed on a clean glass slide. It was then dried in air, after which it was stained with methylene blue and dilute Carbol Fuchsin. The staining was at first not very distinct, but on heating gently differentiation became clearer.

Under the highest power of the microscope (680) I was able to discern clusters of the germ and some/

some in pairs. But I was unable to prove entirely to my satisfaction that the Bacilli may not have gained access from the Respiratory passages to the vomit.

They were very minute rods, occurring in clusters principally, but a few could be seen in pairs.

As regards culture, I was unable to carry this out, as the means at my disposal in a country practice were limited and the heat was rather severe, seeing that it was summer time, with the temperature sometimes up to 103°F. in the shade.

EXPERIMENTS ON ANIMALS.

I injected some samples of vomit into rabbits, which abound in this locality in thousands, but got only negative results, showing that rabbits are apparently non susceptible.

PFEIFFER'S BACILLUS.

This bacillus was discovered by R. Pfeiffer in 1892 who originally described it as a small non-motile organism which stains well in Loeffler's Methylene/

Methylene blue or in a dilute pale red solution of carbol fuchsin in water. On culture media, it grows only in the presence of Haemoglobin.

It does not stain by Gram's method. It may be isolated in pure culture by planting on serum agar.

It is described as a very minute rod, moderately plump, measuring 0.2 to 0.35 x 0.5 to 1.6 microns in dimensions. It occurs singly, in pairs, or in clusters, but occasionally in distinct chains; is aerobic, non motile, growing best at 37°C. feebly at lower temperatures. On glycerine agar it forms minute glistening transparent colonies after 24-36 hours.

PERIOD OF INCUBATION OF THE DISEASE.

It was difficult to arrive at a satisfactory conclusion as to the period of Incubation, as the various members of a family were continually in contact with each other; but in four or five cases, one or two members of the family had been away on holiday, and, on returning to the infected household, they became infected in less than four days. It would appear/

appear, therefore, that the Incubation period is quite short.

SYMPTOMS.

I propose here to state the symptoms of the whole group of cases, some of which were very much worse than others.

Males were more frequently affected than females, 49 males to 41 females, children not being nearly so often affected as adults, there being only 14 children out of the 90 cases. There was no instance in my cases, of an infant at the breast, being attacked.

The black race (aboriginals of Australia) did not appear to suffer from the disease, for in no case was I consulted by any of them. They live in tents in the fresh air and lead a roaming life, not mixing very much with the white population.

The worst cases, both male and female, appeared to be attacked with great suddenness.

In some cases there was a history of the patient having eaten something which had disagreed e.g. a baked potato, some bread, or a boiled egg, though by no means was this invariable, and in such cases/

cases these articles of diet were at once blamed as the cause of their trouble by the patients, for they had in nearly every instance felt quite well before partaking of this food.

Those affected were suddenly doubled up with intense agonising pain in the epigastrium, causing them to roll and groan from the intensity of their suffering. Some of them said the pain was like a knife being pushed through their stomach, and it occurred in spasms. The very severe cases could not remain in bed at first, and preferred to be on the floor, so great was their suffering.

The vomiting set in almost immediately, and rigors were present in my worst case but not in the others. At first the patient brought up whatever happened to be in the stomach, and later merely thickened glairy mucus, which adhered to the receptacle, though not to so marked an extent, as in the case of sputum from pneumonic cases. There was no specially disagreeable odour, except a slightly heavy smell and I could detect no blood in any of the vomited matter during the whole epidemic, though the emesis was often severe and continued for a considerable period, causing the patient to strain a great deal on each/

each occasion.

In a few cases the headache was severe, but in others was not much complained of - where it did occur it was frontal.

Some complained of pains in their limbs and back and others of a feeling of weakness only. The appetite was completely lost. Perspiration was profuse in the worst cases, and it was easily possible to wring the moisture out of their night garments with the hands.

Some of them were in a complete state of collapse, the pulse being very rapid, thready, and weak. The eyes had a staring glassy expression, and the extremities were cold and cyanosed in one or two cases.

TEMPERATURE.

The degree of pyrexia varied very considerably, in the severe cases reaching to 103°F. and in one instance to 104°F. where prostration was marked it was, as a rule, normal.

The milder cases seldom went above 99°F or 100°F. and a few were normal throughout.

THE TONGUE/

THE TONGUE.

The tongue was dry, thickly coated with a white fur and the breath was sometimes very offensive, while in the milder cases it was not so disagreeable. There was loss of taste. The urine had the usual febrile characters and appearance - scanty, high coloured and mostly with brick red urate deposits; but albumen was never detected.

THE EPIGASTRIUM.

The epigastric region was extremely tender, so also was most of the abdomen in the worst cases, even for some days after all pain and vomiting had ceased. The patient suffered from constipation as a rule, though in some cases they had severe and uncontrollable diarrhoea and indeed a few of the cases began with diarrhoea even before pain or vomiting.

This appeared to be the case where patients were attacked later on towards the close of the epidemic. The stools were somewhat darkish in appearance and bad smelling, and where jaundice was present, they were more pasty and evil smelling.

Tenesmus was severely complained of by some
of/

of my patients, and the motions here were slimy and small in quantity, but I could detect no blood in the receptacle in any instance.

JAUNDICE.

In several of the cases there was well marked jaundice of the skin and conjunctivæ, but this passed off in the course of a few days. The fact that, when jaundice was present, the stools were somewhat acholic, would suggest that the icterus was of a catarrhal nature.

In all cases, with two exceptions, the other organs appeared to be normal, but in these two there was some, though not marked, enlargement of the spleen. In one of these cases my Principal, who saw him with me considered the malady to be Typhoid fever at first, and later on said he could suit it with no better name than "Typhoid" Influenza, so profound appeared the toxaemia. In due course the case turned out to be one of Gastro-Intestinal Influenza.

The abdomen was held very rigid by many of the patients, and in some it was distended with gas (meteorism), but fortunately only three suffered with this/

this last distressing symptom to any specially severe extent.

EYE SYMPTOMS.

Eye symptoms were occasionally noted. Conjunctivitis was present in a few cases, but most of the patients complained of a dry burning sensation in their eye-lids, and there was very little lachrymation.

One or two of my cases appeared to be a mixture of pulmonary catarrhal influenza with the Gastro-Intestinal type, for there were catarrhal symptoms and dull aching pain at the back of the eye-balls.

DIAGNOSIS.

The diagnosis was very difficult in some cases, especially in the earlier ones, before I had any great experience of the disease.

1. Some of the cases suggested acute Peritonitis from Gastric pin-point perforation, owing to the gradual onset of symptoms of collapse and the attitude of the patient with his/

his legs drawn up in bed and the rigid abdomen, but the pulse did not suggest Peritonitis except in my worst and first case and there was not the anxious expression in the face as seen in Peritonitis.

2. Then Strangulated Hernia had to
 3 be eliminated, also Appendicitis and Typhlitis for many symptoms of these were present. As regards obstructed or strangulated hernia I examined all the usual hernial openings, even though the patients declared they had never suffered from rupture.

Appendicitis and Typhlitis were more difficult to differentiate, especially when every part of the abdomen was tender. In one case, that of a boy aged 11 years, I made a mistake in my diagnosis, as he had all the Gastro-Intestinal Symptoms and as I had seen fully 40 cases then, I considered it to be that disease. In two days alarming symptoms of peritonitis appeared and extreme tenderness over McBurney's point. I operated without delay, and found appendicitis and diffuse general peritonitis and some foul smelling pus in the abdomen. The boy died next day.

4. Colic - During the "unripe fruit season" many children suffer from the effects of eating green fruit and may show many of the symptoms of Gastro Intestinal Influenza. The history and the discovery of unripe fruit in the vomit sufficed to clear this up without much difficulty.

5. BILIARY COLIC.

This is difficult to differentiate especially if jaundice and bilious vomiting be present and also if the pain be referred more to the right side of the epigastrium or right hypochondrium.

But as a rule the history, age of the patient, also his appearance, and absence of tenderness over the hepatic region, cleared this up.

6. RENAL COLIC.

This required to be eliminated also. One relied upon the history and position of the pain, also on the facts that the genitalia were unaffected with the pain, and there was no haematuria nor difficulty nor frequency in the act of micturition. The rise of temperature in Influenza cases was also an aid to differential diagnosis.

7. TYPHOID FEVER.

To differentiate Gastro-Intestinal Influenza from Typhoid Fever may be difficult, and I found it especially so at first in the case which my Principal saw with me where there was some collapse, meteorism, diarrhoea, vomiting, severe headache, coated tongue and delirium, but the case was diagnosed later on, as no rose spots appeared on the abdomen, the stools were not pea soup and the temperature course was not that of Typhoid. I had no means of testing for Eberth's Bacillus of Typhoid nor for Widal's reaction.

8. CHOLERA - Cholera Infantum, Summer Diarrhoea.

These affections need to be remembered also.

In cholera the nature of the collapse is more profound and the Rice water stools would help, in conjunction of course and the discovery of the Comma Bacillus of Koch.

Cholera Infantum.

The great prostration of this disease from the onset, the characteristic ashy grey appearance of the child and occurring as it does in artificially fed infants or in those where dyspeptic/

dyspeptic trouble has been known, aid one in arriving at a diagnosis.

Gastro-Intestinal Influenza did not attack any infants at the breast, and not even those artificially fed, amongst my patients.

Summer Diarrhoea.

This again affects infants artificially fed and the motions are not watery.

9. Ptomaine, and Arsenical and irritant Poisoning.

These symptoms may resemble in many particulars those of Gastro-Intestinal Influenza but the history and appearance of vomit will usually clear this diagnosis up.

10. Acute Haemorrhagic Pancreatitis.

The symptoms here may be very like those of Gastro-Intestinal Influenza but in about 24 hours after the onset a circumscribed swelling may be felt in the epigastrium, high pitched and resistant to percussion and palpation respectively. Circumscribed tenderness in the course of the Pancreas and tender spots throughout the abdomen are valuable diagnostic signs (Fitz) p. 590 Ed. IV. Osler.

11. INTUSSUSCEPTION.

This requires to be kept in mind.

If the case be seen early the difficulty may not be so great, but if a general peritonitis sets in before one is called in, the diagnosis may be impossible without exploration.

In children the constipation, tenesmus and blood in the slimy motions help the diagnosis and the Intussusception may be felt abdominally or per rectum. I have since had a very interesting case of Intussusception in an adult married woman who was confined on the Friday morning without medical aid, a midwife alone having been called in. On Sunday morning incessant vomiting began and I was called in to see the case and found a boggy swelling on the right side which gurgled distinctly. She was operated upon and nearly 2 feet of gut removed. This case showed many symptoms which might have been mistaken for Gastro-Intestinal Influenza and might readily have been so diagnosed if seen during an epidemic.

PROGNOSIS.

The/

The Prognosis was in most cases good except in the aged and where any severe complication set in. Every case must, however, be considered on its own appropriate symptoms, & the presence or absence of general symptoms of heart failure enable one to come to a conclusion on the question of prognosis.

TREATMENT.

Treatment when carried out early soon made an improvement in the condition of the patients, and their convalescence was much more rapid than was that of patients, who lived some distance (in some cases 50 to 100 miles up country) and to whom I could not get for some time after the onset of the disease. As a matter of fact two of my fatal cases were those at a distance. The treatment adopted was:-

(a) External.

(b) Internal.

EXTERNAL TREATMENT.

I ordered the patient at once to bed and where he or she could not remain in bed at first owing to physical suffering, I had the body dried of all/

all perspiration and the night garments changed and blankets put round the body. At first I used to apply hot bran bags, hot water cloths, mustard or linseed poultices to the epigastrium, but these appeared to give little relief, until I happened to consider how like to the pains of Peritonitis these abdominal pains were, and this induced me to try turpentine sprinkled in fair quantity on hot damp cloths. To my delight these acted almost as a specific, giving great relief in from 15 minutes to one hour in all these cases.

The turpentine caused considerable reddening of the epigastrium, but I had given careful instructions and directions so as to avoid blistering. Subsequently warm olive oil was applied to the reddened area and this was found by the patient to be soothing in its effect.

In cases where there was any collapse as soon as the patient was got into bed, hot bottles were applied to the feet and legs.

All vomited matter was disinfected with strong cyllin and buried.

INTERNAL TREATMENT.

I/

I commenced the internal treatment by gr.III - gr. V of Calomel and about one hour later by a sedative mixture. The one used by me was:-

R/.

Bismuthi Carb ʒii

Mag. Carb ʒii

Tragacanth q.s

Aq Anethi ad ʒ Viii m

Sig. ʒss t.i.d. as directed.

This was often not retained at first, but after a few doses the stomach seemed to tolerate it much better. Sips of cold water and ice (which was only obtainable on arrival of the steamer) were all I allowed at first.

This treatment was followed, as the pain and vomiting got easier, by barley water, lime water, and flaked rice water. Later by chicken broth, Valentine's Beef Juice or Wyeth's Beef Juice.

These broths, and at times arrow root and gruel, formed the diet for a fortnight after the severe symptoms had subsided, and later milk and milk and soda or Potash water if the patient cared for it, but many country people get very sick of milk and refuse to take it. After the stomach was in

a/

a more settled state I changed the sedative mixture for a saline one

R/.

Sod. Salicylatis ʒii

Pot. Bicarb ʒii

Pot. Citratis ʒiii

Glycerine ʒss

Aquam ad ʒviii_m

Sig. ʒss t.i.d. in a little water between meals as directed.

The bowels were regulated with Calomel or seidlitz powder.

At first I permitted no effervescing drinks and at no time until convalescence was well established did I allow alcohol in any form.

CONVALESCENCE.

Convalescence was rapid and complete in some cases, but in many it was decidedly protracted, especially in the aged. The heart was much weakened in these patients, who required strychnine tonics, champagne, port wine, where available, and a nourishing diet. Great care was taken to avoid all draughts/

draughts. Relapse only occurred in one of my cases. During the period of Convalescence some of the patients complained of their head paining them and of insomnia, of general weakness and melancholic feelings.

COMPLICATIONS

The complications were not numerous in my series of cases. Those noted were

- (a) Herpes of the lips and chin 3 cases.
- (b) Erythema and Phlebitis of left leg
1 case.
- (c) Acute Bronchitis 1 case.
- (d) Acute Meningitis. 1 case.
- (e) Hysteria and Hysterical
rolling of the head and aphasia) 1 case.
- (f) Melancholic symptoms. 15 cases.
- (g) Mis-carriage. 2 cases.

THE FURTHER SPREAD OF THE EPIDEMIC.

The epidemic after dying away in Port Lincoln travelled for 310 miles up the West Coast of Eyres Peninsula, and appeared to die out gradually.
It/

It seemed to attack the up country people with much less virulence than those in the more crowded towns and cities.

INFERENCES.

1. This is not an ordinary type of Influenza though well enough known. It was described by the late Dr. D.J. Brakenridge of Edinburgh in a lecture before the Medico-Chirurgical Society of Edinburgh on March 5th 1890 when he discussed the subject of Influenza and touched upon the Gastro-Intestinal type. He considered it as really a modified type of Dengue.

2. It is important to recognise the disease and differentiate it from more serious abdominal lesions, and when it appears to resist treatment one must not fail to enquire concerning other abdominal mischief, which might concurrently be present and the symptoms marked or modified by co-existence of the Gastro-Intestinal Influenza. This happened to me in the case of/

of the boy quoted under Diagnosis (3) appendicitis. I was called 14 miles up country to see him, when he appeared to show a typical clinical picture of Gastro-Intestinal Influenza. I treated him accordingly but the symptoms grew worse, and the vomiting became bilious with a tendency to become slightly faecal in odour. Peritonitis had set in, as was evident by the pulse, rigid abdomen, legs drawn up, & peculiar moaning noises, which I have heard on some occasions since, and the anxious pinched expression of his face. (Hippocratic facies). The boy was operated upon immediately when Appendicitis and diffuse suppurative Peritonitis were discovered.

3. The abdominal type is as infections as the other type of the disease and as far as I could determine appeared to be spread by the vomit, for it was those who attended to the emptying of the receptacle containing the vomited matter, who most frequently caught the disease, which sometimes appeared as the ordinary Catarrhal Influenza or a mixture of the Catarrhal with the Gastro-Intestinal type. This fact suggests/

suggests that the Influenza so spread, may be of the other type, than the abdominal one.

But in most of my cases the abdominal appeared to communicate the abdominal variety.

4. The excessive depression following a great number of these abdominal cases is a feature not observed in the ordinary catarrhal influenza.

With further experience on this side of the Hemisphere I have attended patients with a modified abdominal type, where the depression during convalescence was even more acute than in the epidemic amongst my patients, and some of them committed suicide.

LITERATURE UPON THE GASTRO-INTESTINAL TYPE OF
INFLUENZA.

In a treatise on Influenza by J. Ruhemann published in Berlin 1891, one finds that the author recognises Influenzal inflammation of the digestive tract as one of the three principal varieties of the disease. He mentions the difficulty which the diagnosis presented in the earlier cases of the 1889-1890 epidemic in Berlin, particularly from Typhoid/

Typhoid Fever.

In some of his cases he found fever of a continued type, bodily pains, ileo-caecal gurgling and loose stools and in two cases Melaena. The tongue was dry, thickly coated, and there was anorexia, thirst, vomiting, listlessness, lassitude and headache, but as a rule the symptoms abated in less time than in the case of enteric fever and in many cases the diagnosis was confirmed by the subsequent neuropathic phenomena during convalescence.

A feature of note with regard to the tongue was, that it always remained moist and red at the tip, even though thickly coated on the dorsum.

In some children the author found strawberry spots on the tongue. In cases with diarrhoea (as was often especially noted in children) the stools were slimy, mucous, blackish-green, and contained a little blood, and there was severe tenesmus, as if showing that the great gut was chiefly involved. In two cases of sisters aged respectively 6 and $3\frac{1}{2}$ years there appeared on the second day of the influenzal attack Choleraic Enteritis with cramps and loss of consciousness, but happily ending favourably (Holz of Berlin). Schweich and Heidenreich were/

were led to diagnose true cholera on meeting with similar cases in the earlier periods of the epidemic.

Regnier met with Melaena on one occasion (Progrès Médical XVIII 7 1890). Ruhemann further notes in these Gastric types, a notable loss of taste, loathing for food, nausea, vomiting, the last symptom being of considerable severity. A sweet smell in the breath, described by some observers as lasting for several weeks, was not met with by him. Slight icterus of the conjunctivae and skin was noted in more cases than one.

The testimony of different authors as to enlargement of the spleen is somewhat conflicting.

Bürner was accustomed to place the absence (in his experience) of enlarged spleen as a great point in the differential diagnosis between influenza and typhoid fever.

O. Siefert also never met enlarged spleen in influenza, but on the other hand Bouchard, Ewald, Krehl, Anton and Bäumler assert its existence.

Krehl saw it in 17 out of 170 cases (10%), in eight of which the spleen was actually palpable.

Birch-Hirschfeld, however, never found enlarged spleen in any autopsy of influenzal case in/

in his practice, while Regnier in 218 cases in children and Comby in similar cases of children never found splenic enlargement. Ruhemann in a further and later article in the Berliner Klinik 1900-1901 No. IX refers to the frequency with which Gastro-Intestinal Influenza has been mistaken for dentition catarrh, and notes how many obscure abdominal cases have been shown ultimately to have been due to influenza and that alone.

From Edinburgh Medical Journal Vol. XXXV P.998-1011 extracts from lecture on influenza by Dr. D. J. Brakenridge read to the Medico-Chirurgical Society of Edinburgh March 5th 1890. Dr. Brakenridge mentions the prevalence and severity of the disease amongst the rich and well-to-do and the comparative immunity enjoyed by the poor and ill conditioned.

PAIN. In many cases a peculiar pain was complained of which starting from the upper lumbar region, passed forwards in the abdomen, as it were through the liver towards the stomach. In some cases it was amongst the earliest symptoms, in a large number commenced on the 2nd, 3rd, and 4th day. It varied greatly in intensity. When a prominent symptom/

symptom it was of a dull, aching, sickening, often unbearably painful nature, a veritable angina. It seldom lasted longer than a few hours.

There was great loss of weight in many cases, but no sore throat in this gastric type.

There was a marked tendency to disturbance of the alimentary canal, the stomach and bowels being in a weak and highly sensitive state. There was loss of appetite, and constipation; and, so long as the diet was light, easily digested, and small in quantity, nothing more.

But, if any other than the most digestible food were taken, severe abdominal pain, retching, vomiting or diarrhoea - sometimes all of these, resulted.

Eating oranges or grapes in many instances produced such results, and in others, the same effects followed the administration of some simple purgative e.g. Cascara Sagrada or Gregory's Powder. The state seemed to be one of atony and irritability.

PATHOLOGY.

Brakenridge (P.1005) says:- it is well/

- (e) well known that the walls or coats of the stomach are in a state of Hyperaesthesia associated with congestion. The condition is due to nerve poisoning by the toxins of the
- (f) Bacillus of Pfeiffer. The vomiting was nervous vomiting, in some cases resembling the violent futile efforts of sea-sickness with even more pain. In the majority of cases the tongue remained quite clean. The diarrhoea which was severe was associated with very painful colic, and unaccompanied by any signs in the stools of inflammation of the bowel. It is well known that paralysis and spasm are closely allied effects of functional disturbances of the nervous system.
- (g) The cough was purely nervous - It was paroxysmal resembling Pertussis. The slightest cold draught tended to bring it on. This pointed to the exaggerated reflex, irritability and abnormal sensitiveness of the laryngeal mucous membrane.
- (h) The eruptions were all of the class of neurosis e.g. Herpes Zoster - Nasal and Labial Herpes &c.
- (i) The vaso motor and secretory disturbances e.g. sweatings, flushings &c.

Dr. Brakenridge/

Brakenridge further states in his lecture that

1. this epidemic commenced in St. Petersburg during almost the same weeks as it commenced in Edinburgh even with such a distance and sea between them.

2. Adjacent villages and towns have been attacked after considerable intervals of time.

Hence from these two strongly contrasted facts the development of the disease would appear to depend on two distinct factors:-

1. A wide spread influence - probably atmospheric.

2. Certain local conditions.

These conditions must exert an accelerating or a retarding influence on the activity of the virus.

The following facts lead one, however, to conclude that the disease is a fever and due to a cause similar to that of other specific fevers viz.

(a) sudden onset.

(b) the fever.

(c) the typical course.

It is therefore probably due to a micro-organism.

Very vague explanations or suggestions of what/

what the changes in the state of the atmosphere and the local conditions are, have as yet been forthcoming.

The mildness of the season has been universally noted as a coincident fact.

Several military surgeons who have had experience of both Influenza and Dengue lean to the view that the disease is a form of Dengue modified by conditions of place and climate.

It is not easy to say positively that the disease is either Dengue or Influenza. Each may be a distinct type and this an intermediate type.

SYMPTOMS OF DENGUE.

1. Absence of running at nose and eyes.
2. Short initial fever, remission and relapse, and a tendency to later relapses.
3. The severe persistent pains in and near the joints - in some cases associated with swelling.
4. The various forms of eruption.
5. Limited to tropical climates as a rule.

LITERATURE/

LITERATURE FROM NOTHNAGEL'S ENCLYCLOPEDIA

of

PRACTICAL MEDICINE.

MALARIA - INFLUENZA - DENGUE.

by

DR. JULIUS MANNABERG.

DR. O. LEICHTENSTERN.

The term Influenza (influxus) was first applied to the disease in the epidemic of 1743 by Pringle and Huxham.

The word points to the causation of the disease "influence of cold" "influenzi di freddo" or influence through atmospheric phenomena.

The word "grip" originated in France in 1743 derived from "agripper" to attack or "griper" to catch - some say it is derived from an insect called "La Grippe".

There have been many pandemics which have spread all over the world. In 1580 the first real pandemic spread all over Europe also reached England. The direction was from East to West and from South to North. Many later pandemics have taken this direction. Due probably to the direction of the commerce of/

of the world.

Since R. Pfeiffer and Kruse have seen the influenza bacillus thrive for months in the sputum of tuberculous subjects who were affected by the influenza, Bäumlér thinks it possible that patients affected with chronic diseases of the chest, who travel much, can very easily disseminate influenza.

We cannot attribute any epidemiologic significance to this assumption (p. 552).

THE PERIOD OF INCUBATION.

This is short 1 to 2 days (page 540). The symptoms due to the Gastro-Intestinal form predominate in that type and chest symptoms are absent and the nervous symptoms e.g. headache do not amount to more than the general "Cephalaea Gastrica".

In these cases the tongue which in influenza is usually moist and only slightly coated, is thickly coated with a dirty white layer. Vomiting is frequently an initial symptom, it becomes constant and may be of a bilious character. The breath is offensive and the appetite entirely lost. The epigastrium is tender to pressure (the frequently noted "influenzal hyperaesthesia of the stomach").

There is most often diarrhoea with abdominal pain/

pain and often distension of the abdomen. Some French Authors assert that these purely "Gastro-Intestinal forms are characterised by but slight fever and an especially protracted course (f.663). If, in any case, the phenomena of a severe intestinal influenza (diarrhoea and meteorism) are combined with those of the nervous form (headache, delirium, apathy), and more especially if there is also high protracted fever, we get the much quoted "typhoid form of influenza" (f.663).

Very remarkable is that form of influenza - it might be called the metamorphous variety - which is at first entirely Gastro-Intestinal and then in a few days suddenly changes into the respiratory variety with diffuse Bronchitis and Pneumonia. At the same time the Gastro-Intestinal symptoms fall into the back ground (f.664).

One addition to the pathology of influenza furnished by the most recent epidemic is the demonstration that influenza may give rise to acute haemorrhagic gastritis and enteritis and sometimes as a sequel also to Peritonitis (f.664).

Many cases of simple intestinal haemorrhages as well as of severe bloody mucus, dysenteroid diarrhoea, in influenza have been described (Landgraf/

(Landgraf, Enggesser, Fürbringer, B.Auerbach, Warfvinge, Melin, Lennmalm, German Army Report, Official Report from Bavaria, Switzerland &c.

The intense hyperaemia of the intestinal mucous membrane frequently found on post mortem examination, with the addition of ecchymosis and streaky haemorrhages, is sufficient to account for the simple intestinal haemorrhages. This variety of haemorrhage from the intestine is analagous to epistaxis and to the influenzal haemorrhages of the pharynx, larynx, and bronchi.

The hyperaemia of the intestinal mucous membrane may progress to inflammation, necrosis and ulceration.

Jürgens in post mortem examination of many cases of influenza, found severe ulcerative or haemorrhagic pathologic conditions of the gastric and intestinal mucous membrane (f.664).

The gastric and other digestive disturbances continue occasionally long into convalescence, and thereby give rise to severe nutritive disturbances and frequently to marked loss of weight (f.667).

OSLER says that with the onset of fever there may be nausea and vomiting or an attack may set in with abdominal pain, profuse diarrhoea and collapse/

collapse.

In some epidemics, jaundice has been a common symptom. In a considerable number of cases there is enlargement of the spleen depending chiefly upon the intensity of the fever. The fever may keep up for weeks simulating typhoid (W.W. Johnston) P.97-98 4th Edition 1901.

COMPARATIVE NOTES BETWEEN THE GASTRO-INTESTINAL
EPIDEMIC AT PORT LINCOLN AND THE EPIDEMICS
MENTIONED IN LITERATURE.

1. Ruhemann mentions the difficulty of diagnosing many of the earlier cases. This was a great difficulty as regards my cases.
2. The disease travelled from East to West in all the great pandemics so also did the Port Lincoln epidemic.
3. Ruhemann, Regnier and other authorities found melaena or blood in the stools. I had not a single case, however, showing any signs of melaena whatsoever.
4. Some authorities mention observing a
sweet/

sweet odour in the breath lasting for some weeks. In the great majority of my cases the breath was offensive, and Rugemann mentions in the literature that the breath is offensive.

5. In those cases of mine in which Icterus occurred it was well marked as a rule. Rugemann mentions it as being slight in his experience.
6. Regarding the enlargement of the spleen, the literature states, that authorities differ greatly on this point. In only two of my cases was enlargement to be detected, and it was not well marked.
7. A curious metamorphous variety of influenza is mentioned in Nothnagel's Encyclo-
pedia of Practical medicine where the Gastro-
Intestinal type at first predominates and in a few days the respiratory form appears with
Bronchitis and Pneumonia. In a few of my cases I mentioned that there appeared to be a mixture of the two types - the Gastro-Intestinal type appearing first and in a few days the respiratory type with its coryzal symptoms, headache, aching limbs &c., and the only chest complication I had was/

was acute Bronchitis in one of these cases. I had no cases of pneumonia.

8. Many authorities mention haemorrhages, necrosis, and ulceration of the bowels as pathological changes in Gastro-Intestinal influenza. If any of my cases had any of these changes, their degree must have been very slight, as I neither discovered blood in the vomit nor stools, nor, even slight melaena, and the patients did not notice any blood, a point about which I always made enquiries.
9. Of all parts of the abdomen the epigastrium was most severely affected in my series of cases during the epidemic, and the lower abdominal region not so severely as a rule. In the literature both would appear to be equally affected.
10. The cerebral depression in my cases in Australia was in some respects very severe and lasting, but the patients never at any time threatened to commit suicide. In England, in the Midlands, I had some experience last year of a modified Intestinal influenza where the after depression/

depression was abnormally severe, and three of my patients committed suicide, thus showing, that though the Gastro-Intestinal Influenza be modified in severity, the cerebral and nervous breakdown may be much greater than is the case in the severer types of the disease.