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# Observations on Influenza with Complications and Sequels.

Although Influenza or Grippe in its uncomplicated form may be regarded as a very simple infectious disease, yet it is a disorder profoundly interesting in many ways, but in none more so than in the number and variety of its complications and sequels. In fact in this respect it may be said to have no rival. More particularly is it so when it occurs in those having constitutional tendencies or hereditary taints, and when the system is in a lowered condition, age

Having likewise to be considered, it is when the complications are found to be seriously masking the features of the disease or when the disease precipitates itself into some calamitous sequel such as insanity or paralysis that the physician becomes alive to the real nature or importance of the malady, and that occasionally the issue has to be regarded with grave apprehension. It was while certain cases having such peculiarly striking complications and sequels were from time to time passing under my observation during the last four years or so - the last visitation of the disease - that I deemed some of them worthy of note. And here it might be remarked that previous to the period above mentioned the disease had for a long time

made no general visitation to the British Isles.

It was therefore practically unknown to most of the younger portion of the present generation of medical practitioners, and so the practical study of the malady has within the time referred to had no little interest to those having the opportunity of observing it. It might even be said were the ~~verged~~ comments and the additional literature on the subject during that period that fresh interest in the disease has again be aroused in the profession generally, resulting in a further scientific elucidation regarding its nature and cause.

The subject therefore becomes more highly interesting when there has been discovered a true basis, or even a highly rational theory given, upon which may be erected an explanation of those protean forms and

Complications and sequels of the disorder. Notwithstanding what is now known, it must be mentioned that Graves of the Dublin School as far back as 1833, gave it as his opinion that the lesions had their seat in the nervous system generally, and in the nerves of the lung particularly. He pointed out then what has only been confirmed since by the experience of the time under review that the functional derangements particularly of the pulmonary organs are out of all proportion to the morbid state discoverable. That is to say there was absence for example of symptoms of consolidation or excess of mucus in the air cells or tubes &c, while the breathlessness was extreme and persistent sometimes causing death. This observation of Graves certainly embraced fully the idea that the lung affection was of nervous origin. But as to the

nature of the lesion or lesions no explanation (practical or theoretical) at that time seems to have been recorded. With regard to this form of complication, however, Ferraud has remarked that there appears to be sometimes a kind of paralytic atelectasis of the lung through loss of elasticity of the alveoles, and bronchial paralysis, as shown by feeble respiratory murmur in a portion of the lung, exaggerated resonance, and increased vocal fremitus. Huchard describes this condition as bronchioplegia. My own practical experience of this complication is that it almost solely exposes the aged to a fatal issue by a respiratory crisis. The action of the influenza poison on the respiratory centre in the bulb will be further referred to as the cause of the complication. (page 45.)

The discovery of the bacillus by Peiffer aided and confirmed by Kitasato and Cannon, and further confirmed by Klein in 1889 and 1891, has shed a new light on the subject and forms the basis of the highly tenable theory that the disease is a "fever of the nervous system" as contended by Dr. Julius Althaus. But there never seems to have been any great doubt at any time as to influenza being a fever, and the first cases that came under my own observation impressed me indelibly so in regard to the febrile character of the malady. And while I shall endeavour to outline the features of a simple typical case just as it presented itself to me I shall at the same time note points of



contrast that might be drawn with certain of the exanthemata. An ordinary typical case of influenza invariably presents the symptoms and appearance of a fever having a resemblance more or less to enteric or typhus fever in the incipient stage. See case of Mrs Cross, page 32, also Guin, page 10, and the cases of the boys named Wylie (page 11). It very often begins with fits of shivering and headache, which is sometimes of a most distressing character and very persistent or with but brief intermissions. There is more or less sickness and sometimes retching and vomiting of a bilious nature. The face, especially when the temperature has become elevated, is flushed. There are pains of a wandering

or fixed character in the back and lower limbs and sometimes through the whole body, the patient feeling as if the whole body had been crushed. Dizziness is also a common subjective symptom which might be due to the action of the influenza poison or might be vestibular, and therefore would be regarded rather as a complication. Cough and sneezing. Extreme prostration which is very characteristic, the patient—sometimes even the first day of the illness being quite unable to turn or even move in bed, so that it is difficult to make a complete examination in some cases. There is elevation of temperature which may be slight or as high as  $104^{\circ}$ , or even a little above that. With

reference to the temperature I have now to observe that when there is a simultaneous prevalence of influenza and enteric or typhus fever, it is sometimes absolutely necessary to wait and note the behaviour of the thermometer. In fact it is necessary to withhold the diagnosis for the time being. In a simple case of influenza the temperature will as a rule return to the normal in from three to six days. When it takes longer the cause may be looked for in some complication which usually has become manifest by that time. Oscillation of the temperature in influenza is not uncommon, though in my experience it has always been

within narrower limits than those of enteric fever. Again for example in the month of Sept., 1893, while enteric fever was prevalent here a mild case of influenza came under my care in a young man of 26 years named Quin. He complained of sickness, headache with pains in his upper and lower limbs and through the whole body. He felt giddy when he sat or stood, and was feeble and much prostrated. His temperature, however, only ranged from  $100^{\circ}5$  to  $102^{\circ}$  for four days and was slightly under the  $100^{\circ}$  on the fifth day. There was a slightly irritable cough but no expectoration. Stethoscopic examination revealed nothing. When I saw him on the tenth day his temperature was normal and his

strength had so far returned. A week afterwards he went to a country district in the neighbourhood of Liverpool for an entire change of air. He was there only about a fortnight when he caught a cold and developed a little local pneumonia (as I was informed), out of which phthisis manifested itself, and he died on the 6th Jan., 1894. This sequel I have found occurring in a fair proportion of the cases of influenza I have met with. Again in Feby, 1892, when cases of influenza were not infrequent here, three boys named Wylie belonging to the same family came under my observation, all being simultaneously affected with febrile symptoms, the temperature ranging from  $101.5^{\circ}$  to  $102.3^{\circ}$ . They all suffered from sickness, headache, troublesome cough, and a considerable amount of muttering delirium during the night in each case. The tongue was dry though faintly clean in all the cases, and there was much thirst. The temperature

oscillated for 3 days in one case, and four days  
 in the second, while it lasted 5 days in  
 the third, and then reached normal. Thus  
 it might with much confidence be asserted  
 that the temperature might be taken to deter-  
 mine almost absolutely between an incompli-  
cated case of influenza and that of enteric  
 and typhus fever, especially when during an epi-  
 demic of the affection it would be impracticable  
 to search for the bacillus of Pfeiffer, the finding  
 of which would admittedly take precedence to  
 the temperature in clinching the diagnosis, as in  
 the case of pulmonary phthisis. As has been already  
 observed it would be <sup>difficult</sup> to differentiate between  
 influenza and enteric and typhus fever earlier  
 than the 5<sup>th</sup> or 6<sup>th</sup> day, especially when there was  
 a simultaneous prevalence of all three.

In considering the temperature in relation to influenza and enteric and typhus fever, I shall now mention briefly a case of influenza complicated with enteric fever. The case seems to me to be noteworthy from its peculiar history. On the 6<sup>th</sup> March last, (1894), I was called to attend a young woman named Jane Parkhill, aged 17 years, residing at 148 George St. here. Her symptoms were sickness, severe headache, cough with slightly purulent expectoration, and numerous rales all over the chest (back and front). The temperature was  $102.8^{\circ}$  and she was extremely prostrate. The tongue was fairly clean and moist. The temperature continued above  $102^{\circ}$  for 5 days, and on the 6<sup>th</sup> was again normal, and remained so a few days when I left off attending. On the 14<sup>th</sup> of the same month, I was summoned to attend her brother Thomas, aged 24 years. He then

presented the same group of symptoms as his sister, except that the bronchial complication was more severe and the expectoration was very copious and purulent. I instructed him to remain in bed till I saw him again, which I did 2 days after-ward (Friday, the 16<sup>th</sup>), and found no difference in his condition. I did not again see the patient till Monday the 19<sup>th</sup>, when fresh symptoms had developed. The tongue was now all thickly coated with a grayish white coating, though quite moist. The pupils seemed rather large and sluggish looking, and the facial expression was apathetic. There was a little tenderness on pressure in the right iliac region, but absence still of spots. Nevertheless I now informed his parents that he was developing symptoms of enteric fever, remarking at the same time that it was a pity that his sister was still in such a weak condition.



from the attack of influenza, as I considered her condition rendered her liable to be seized with the infection of that fever, and the more especially as the mother was, through force of circumstances, nurse to both patients. From the 14<sup>th</sup> the date I was called to see Thomas, I kept taking the temperature of both, and found that of his sister continuing normal, while the brother's was gradually ascending, and in the second week was oscillating between  $102^{\circ}$  and  $104^{\circ}$ . His motions had become loquid, of a pale yellow colour, and occurred 2, 3 and 4 times a day. A spot here and there of a rose colour & fading on pressure had come out on the abdomen and chest. On the 24<sup>th</sup> (Mardi) I reported his case under the Infect. Dis. Act. and, on account of his extreme weakness, as unfit for removal to the hospital, the temperature continued to oscillate between  $101^{\circ}$  and

104° till the 20<sup>th</sup> April, when it receded to normal and remained so afterwards, being a degree below that for a few days after the above date. He is making a good recovery.

On the 24<sup>th</sup> (March), the day I notified his case his sister who had influenza complained of sickness with slight headache, and her temperature registered 102°. From then it gradually rose daily till it reached 103.5°, and oscillated between that and 101.5° for twenty three days when it again became normal. All the leading symptoms of enteric fever having developed, her case was duly reported (under Infect Dis Act.) and she was removed to the hospital here on the 12<sup>th</sup> day of her illness. She is also making a good recovery.

The simultaneous operation in the blood of the bacillus of Pfeiffer and that of enteric fever is a perplexing problem, the solution of which can only be attempted by the same ~~the~~ theory as offered in the case of erysipelas as a complication, page 18 & 20.

Again I shall note briefly here the following three cases of influenza occurring in the same family as being interesting from the difference in the nature of their complications. (1) James Gudwin, aged 26, 10000 St. here, in the third week of Nov. last, (1893), complained of feelings of chill alternated with flushes of heat; headache with ~~with~~ slight cough, and pains wandering all over his body and limbs, and there was slight-elevation of the temperature. His tongue also felt rather tender and in about 3 days became enormously swollen, so that it was difficult for him to take nourishment, to speak, and for others to make out what he said. Warm water faples were administered, as also combinations of the chlorate of potassium and glycerine, and for food iced milk. The tongue gradually in the course of about 8 days returned to its normal size.

- (2) His sister aged 24 years, in the last week of Nov-  
(1853), complained of symptoms similar to those  
from which her brother suffered the week previously,  
except that the tongue was not involved. However,  
the conjunctival membrane of both eyes was severely  
injected and required treatment for about 3 weeks,  
when the inflammation entirely disappeared.
- (3) The mother, Mrs G, aged 53 years, began to complain  
on the 3<sup>d</sup> Dec, (1853). She suffered from severe  
fits of shivering, headache, and pains everywhere  
in the body and limbs and great prostration.  
Her temperature then only registered  $100.5^{\circ}$ . On  
the following 4 days there seemed little change in  
her condition, but on the 8<sup>th</sup> there appeared about  
an inch below the inner canthus of the left eye  
a little red spot about the size of a shilling,  
which she said had a jiggling feeling. On the 9<sup>th</sup> it had  
spread up on to the brow and across the cheek. On  
the 10<sup>th</sup> it had gone up on to the scalp, and down on

to the neck. Her hands and arms were tremulous, and there was slight delirium. The heart's action was very irregular. The same evening the delirium grew worse, the heart became feeble, and she died early on the morning of the 11<sup>th</sup> Dec, 1873.

Regarding the complication of glossitis there might be by some peculiar predisposition or idiosyncrasy a migration of the bacilli of Pfeiffer into the substance of the tongue where by preference they would multiply and cause irritation of the vaso-motor nerves, establishing active congestion.

So far as regards Conjunctivitis as a complication of influenza it has been hotly disputed whether that membrane forms a gateway of the poison to the system. Absorption would seem quite possible but the fact of that form of eye complication being so responsive to treatment gives the ground for contentment.

Concerning the occurrence of such a

Specific inflammation as erysipelas as a complication it is supposed to be more probably due to the circumstance that the power of phagocytosis is lost in consequence of the illness, and that those bacteria which in health are habitually destroyed by the leucocytes whenever they make their appearance at the entrance gate of the system are then readily admitted and allowed to multiply in the blood, when they will cause their own specific inflammations.

The Ferguson and other cases. (21)

The following are cases noted under earlier observation, and I have placed those of the Ferguson family first on account of the striking infectivity they exhibited, the case of Mrs Ferguson showing remarkable complications. The group seemed to me to consist of remarkably typical cases of influenza.

Mr Ferguson Farmer, Holly house, Gleniffer, being aware that influenza was rife in the town of Paisley in January, 1891, and having heard as he remarked to me on being called to attend that it was a highly infectious and dangerous disease, gave peremptory orders to his manservant, a lad of about 18 years, not to visit the town for the present, and till he had received permission. However, about a week afterwards contrary to orders and without the knowledge of any one in the farm he payed a visit in the evening to the town.

The third <sup>day</sup> afterwards he complained of cold and shivering, and felt so ill on the following day that he was unable to come out of bed. His symptoms were severe headache and backache, sickness with retching, also pains round the hips and in the legs and all round the chest. He said he felt dizzy when



he tried to sit or stand. The second day of the illness there was a troublesome cough with hot skin, the thermometer registering  $103^{\circ}$  at intervals of from four to six and seven hours he had fits of profuse perspiration followed by a feeling of faintness. The symptoms lasted about a week, and it was nearly a fortnight afterwards before he could do any work on account of weakness and vertiginous seizures.

Miss Ferguson acted as nurse, and about the twelfth day of his illness she began to suffer from a feeling of cold and fits of shivering, and two days afterwards was unfit to leave the bed. Her temperature the second day of her illness was  $102.5$ . There were severe frontal headache, pains in the back passing down the legs and round the body, and the feeling, as she said, as if every bone in her body had been broken.

she sneezed frequently for two days, and her voice indicated a cold in the head. There was a dry irritable cough with scanty expectoration, the sputum being streaked with blood on the third day of her illness. A limited area of tenderness to the touch had developed on the left side of the chest, and she said she was paddy when she tried to sit or stand. She slept none the first three nights of her illness.

On the fifth day her temperature had receded to  $100.5^{\circ}$ , and the pains she said were leaving her. This day the sister next to her complained that she herself did not feel well. She felt sick with pain in the head and chilly feelings at intervals. I advised her to go <sup>to</sup> bed at once and the mother then undertook the entire nursing of the patients, now three in number. Patient Number three the third day of her illness developed

a temperature of  $103^{\circ}$ ; a persistent frontal headache, and a violent cough accompanied by a clear but rather tenacious spit - with a few air bubbles mixed. The stethoscope placed on the right and left front wall of the chest only revealed a rale here and there, while a similar examination of the posterior wall gave a no less favourable response. Slight pressure, however, with the points of the fingers on the chest walls caused much pain. She still complained very much of the vertigo.

I was the same day summoned again hurriedly to see Mrs Ferguson whom, on my arrival an hour after being called, I found in bed. Her expression seemed peculiar. A glance revealed to me there was paralysis of one side of the face - the left. Her efforts to respond to my interrogations totally failed, so seriously was the tongue involved. The sensibility of the affected

Side remained quite intact, the prick of a pin causing pain. She seemed perfectly conscious and intelligent at this stage of her illness, and took all the nourishment given her. Her temperature registered 100.8°. She showed symptoms of restlessness bordering on excitement. The temperature the second day was 102°, and never went higher, but returned to the normal two days afterwards. On the fifth day of her illness she was seized with violent delirium and made every effort to come out of bed, and it was with much difficulty she was restrained and prevented from doing so, being a strong heavy muscular woman. The delirium being still very troublesome on the 6<sup>th</sup> day, I put her (notwithstanding the facial paralysis) on 30 grain doses of the bromide of potash with similar doses of the hydrate of chloral every 3 hours till she became calmer. The delirium, however,

doses

returned when she was not under the influence  
 of the drug, and was of a very violent character.  
 It lasted about eight days. In the meantime  
 I had clipped out the hair and applied Croton  
 oil over the whole region of the scalp, the eruption  
 being tolerably well developed on the second day  
 after the application. Her mind was now quite  
 a blank and I regarded her as insane  
 when the delirium had subsided which it did  
 gradually in the course of eight days her mental  
 faculties seemed to have gone with it. At  
 the end of 6 months there were only flimmers  
 of a return of intelligence, and now three years  
 after the attack her mind is weak. Her mem-  
 ory as a faculty of the mind has begun to im-  
 prove a little of late, and she has begun  
 to write short letters to her friends. A noteworthy  
 point in regard to this is that she fails almost en-

tively in her spelling. Formerly, her family tells me, she rarely made a mistake in spelling but now, they say, her letters are full of errors of that kind.

## Case of Mrs Letch.

Insomnia  
 Maniacal excitement-  
 Vertigo  
 Miscarriage  
 Purpura hemorrhagica

The illness of this patient began on the 16<sup>th</sup> Nov. 1893. with fits of shivering, intolerable frontal headache, and pain in the back and legs, and all through the body. There was a dry hacking cough unaccompanied at first by expectoration, but on the third day a sputum, with much difficulty and choking sensation, came up on coughing, having the appearance of thin boiled starch or flour and was very tenacious. She said she felt a whirling sensation in her head when sitting, and as if she would fall over. Her temperature taken once a day never exceeded 102.5 during the first eight days of illness, and receded to normal on the 9<sup>th</sup> day, and remained so afterwards. For

the first five days she suffered from sleeplessness culminating on the sixth day in maniacal excitement, delivering volleys of most abusive language to her husband and threatening him with violence. It was with much difficulty that she could be restrained in bed. At this stage and phase of the illness the husband became highly nervous about the patient, fearing insanity. There was a known predisposition lending a colour to the psychosis of the case that rendered doubts as to the mental issue. Toward the close of the same day, however, her mental equilibrium became so far established, the lesion involving the psychical centres having fortunately been slight. I have now to mention that my patient was encephalic, and that



I was surprised for the accouchement which according to her calculation, she expected would take place in the middle of December. In the meantime I had been treating the nervous symptoms with gradually increasing doses of the Bromide of Potash with Chloral Hydrate and Antipyrin in combination for the frontal headache, with successful results. On the 24<sup>th</sup> Nov. the pains of labour became established, and the same evening I delivered her of a strong healthy male child. The patient however was in a much debilitated condition, and it was only at the end of the second week in Dec. that she was fit to sit in bed. From that time her progress was gradual but slow. Also at that stage of her convalescence a profuse display of purpura haemorrhagica took place on both lower limbs, and to-day, 20<sup>th</sup> Dec/93, it is but faintly exhibited.

She also informs me that it is only within the past few days that the vertiginous attacks have disappeared. The legs I observed were slightly oedematous, but the urine examined yields no trace of albumen to heat or Acid bitric fort. I therefore regard the symptoms as that of debility consequent on the attack of influenza.

Case of Mrs Cross, aged 35.

Bell's Paralysis  
Vertigo  
Impaired memory  
Neuroasthenia

At the time this case came into my hands there was an epidemic of enteric fever raging in the town. The dominant feature of the case at first was a high temperature, 104°, which was maintained for four days in succession. The fact of this continuous and invariable temperature cleared up all doubt as to its being one of enteric fever with a violent-onset. It rather simulated that of typhus fever than that of any other exanthem. On the fifth day the temperature dropped suddenly to normal and remained so afterwards during the rest of the illness. She complained of swimming in the head and said she felt giddy when she sat. She also complained of pain in the throat and in the right ear at frequent intervals. The latter

I attributed to the inflammation passing along the lining and nerves of the Eustachian tube from the pharynx to the middle ear, or to reflex irritation from throat to ear and vice versa. She also complained of pains in the back passing down into the legs. This might be due to a congested condition of those centres in the Cord which are supposed to be the seat of a low form of consciousness. She complained further of very acute ~~pain~~ and continuous pain in the region of the frontal sinuses, which I thus interpret: When pain is continuous in the region of the frontal sinuses it may be inferred that - the lining of those cavities is ma

highly inflamed or congested condition and the source of pain. When on the other hand the pain in that region and the forehead is of a paroxysmal character I regard it as entirely nervous in its origin. The respirations were 24 per minute. There was a slight but frequent cough with very little expectoration, and no trace of dulness anywhere over the lung area of the chest (back <sup>or</sup> ~~and~~ front). The cough was readily traceable to the evenly temperature of the room, and to some extent I believe to the nerve sedative administered for the headache and the sleeplessness. About the ninth day Bell's paralysis declared itself on the right side of the face.

The affected side at the same time became rather swollen and exquisitely tender to the touch, and the tenderness passed up over the right half of the cranium. After the lapse of a week from the time the paralysis declared itself the battery was applied mildly from behind the ear, round the whole of the right side of the face and up over the right half of the scalp every other day for fully three weeks. The patient could then close the upper eyelid and form the mouth so as to whistle, and all trace of the paralysis had disappeared. However, three months after the beginning of the illness the patient had not quite regained her usual strength, but showed weakness of <sup>the</sup> nervous system generally. Her memory has also become much impaired now  
 2 yrs after the illness.

# Influenza in Infants.

(36)

I have observed several cases of the ~~mala-~~dy in infants who were being suckled by mothers affected with the disease. It was then a question in my mind whether they had contracted the disease through the milk or from contact simply with the patient. I however, have concluded from Couron's recent experiments with the blood of influenza patients that it was easily possible to happen either way. The bacillus being in the blood there is little doubt but it was also present in the secretion elaborated by the mammary glands, and the practical investigation of this point would be highly interesting. In the case of those infants who were only a few days old I invariably found them utterly prostrate. Hastily and

pallid, they lay motionless in a state of apparently profound somnolence. They never awoke. They refused all nourishment. They indeed seemed so prostrate and weak that they were unable to open their mouths or swallow, and ultimately ~~in~~ about from three to four days they seemed literally to sleep themselves to death. The three infants to which I specially refer succumbed, mortally poisoned by the virus of influenza, with hardly any other symptom but what might be referred to the nervous system.

It was different, however, with those a few months old. They developed symptoms quite characteristic of the disease in the adult - sickness, elevation of temperature, bronchial or pneumonic cough, anorexia, disordered digestion and bowels, accompanied and followed by great prostration and weakness etc. The prognosis, however, in this latter group, contrary to what might be expected, is highly favourable, death being the exception, and invariably the result of pulmonary complications.



With regard to the variations in the symptoms duration, and complications and sequels of influenza no more plausible explanation than that afforded by reference to what is known to take place in pneumonia has as yet been given. In that disease it is known that it is not so much the presence or number of bacilli (or diplococci in the blood, which excites the symptoms and sometimes destroys life, as their poisonous secretion. The splendid researches of G. and F. Klempner have shown that all the symptoms of pneumonia can be developed by injecting rabbits with the poisonous albuminoid substance obtained from the diplococci as a white amorphous powder when treated with alcohol.

This pneumotoxin when it gets into the circulation sets up fever and partial or

total lung consolidation made worse by the depressed condition of the nervous centres of respiration and of the heart. The idea is that in the course of the disease the pneumotoxine forms its own antidote, or is aided in so doing by the albumen of the serum; that as soon as this process has begun the crisis of the disease begins, and so the process is supposed to go on in favourable cases till all the pneumotoxine has been neutralised. The patient's blood is then supposed to have become innocuous. And further it is supposed that when there is not sufficient antitoxin formed to neutralise all the toxin in the circulation there will be only a pseudo-crisis, the fall in the temperature more or less slight and temporary. And on the other hand if there be excess of antitoxin after the crisis is over, the patient has at

least temporary immunity conferred, which may be lost by the disappearance of the antitoxine from the blood. If this theory therefore resulting from the researches of Klempner be applied to influenza there is for the present a feasible explanation of how the disease may be acquired; how recovery takes place; and how a secondary attack may take place.

With regard to the origin of the sequelae of influenza and having reference to the psychosis of Mrs Ferguson (page 21), three primary factors may be considered in explanation of the phenomena. (1) The influence of the fever or temperature, (2) the virus of influenza, and (3) susceptibility.

The effect of a rise in the temperature of the blood on the nutrition of the brain matter

and the consequent disturbance of the mental functions is manifest. Physiological experiment has shown that the frog's leg after being artificially heated by a few degrees to which it gives exaggerated responses, becomes paralysed ultimately and fails to give further responses to stimuli. The same effect clinically is observed in the hyperpyrexia of rheumatic fever, heatstroke and such infectious fevers as pneumonia, intermittent fever and the acute exanthems where sudden elevation of temperature has been experienced in the nerve cells and centres of the brain. As a result there has been increased oxidation of the uncombined albumen of the brain, the chemical change causing irritation and subsequent depression. When the unoxidised albumen in the brain has become exhausted, the

psychical as well as the other centres become impaired by the destructive effects of the temperature. If the heart's action be increased as it is more or less in the febrile stage the irritation will be increased with increased danger of evil consequences. At this stage the head symptoms are also clinically those of hyperemia. When, however, failure of the heart comes on and its consequence congestion of the brain, anæmia may follow or the still worse consequence œdema.

(2) While the brain may suffer from the increased temperature intensified by increased action of the heart, there is reason to think that the virus of influenza is itself a potent factor in the blood in the production of the sequelæ having their seat in the psychical centres. As is sometimes seen in enteric fever, small pox &c, delirium <sup>occasionally</sup> precedes the rise in the temperature, being

Sometimes the first symptom of the illness, and when the heart's <sup>action</sup> has not been increased. And though as is seen in some cases the temperature is not much elevated and but of short duration, the prostration that follows would seem beyond explanation, except on the assumption of the deterioration of the nerve cells and centres by the virus of influenza. The degree of fever would often appear to bear no relation whatever to the gravity of the sepsis, mental or otherwise. And the virus too in some cases seems to continue its work of destruction after the fever has subsided. In this respect influenza bears a strong analogy with syphilis, where the primary symptoms may have been so mild as to cause slight notice, and have been afterwards followed by severe secondary and tertiary ones.

In regard to psychoses after influenza it is contended that there must be an individual

predisposition to cause acute mental dejection, but the assertion that all such cases are determined exclusively by heredity is too sweeping by far. All the same I believe it will be admitted on all hands that a very high percentage of the cases of acute insanity accompanying or following influenza are seated upon a neurotic basis, or some constitutional state such as anaemia, heart-disease the puerperal state &c. An analysis of 107 cases in which the history of the patients was given, showed there was a neurotic condition in 67, and no predisposition in 30. Expressed in percentages there were 62.8 predisposed, and 37.2 not so.

Then again though it be readily admitted that idiosyncrasy plays its part as a determining cause in the psychoses after influenza, it has

not been a notable one so far as experience or records show.

All clinical experience enables it to be contended, from the greater liability to psychoses after influenza, that the virus of the disease has a more specifically injurious influence on the brain than other morbid poisons.

Particularly during the febrile stage of the disease do we find the complications of such a nature that they are nearly all referrible to the medulla oblongata or roend vital of Florens. Here are seated the centres of life, cardiac, respiratory, vaso-motor, that influence glyco-genesis &c. Here the virus of influenza prefers to attack, and here it chooses as the seat of its destructive operations. The consequences are certainly not unlike those of some of the virulent poisons which elect some of



these centres for their action. By analogy therefore there is room for the theory and argument that influenza is an "infectious disease of the nervous system".

## The treatment of Influenza.

As there is no known cure or specific for the disease every case must therefore be treated on its merits. Unlike many other diseases the patient from the very first desires to remain in bed, and feels best there with the illness. Even in the simplest of cases the patient almost always expresses himself as being fit for nothing but being in bed. In this way it might be considered that the disease so far guards itself against the dangerous complications with which it is otherwise beset. The malady is certainly best treated by confining the patient early to bed, or a warm well ventilated bedroom, the temperature being maintained

at from  $65^{\circ}$  to  $70^{\circ}$ . Hot sponging, or a hot bath at the beginning of the illness sometimes in addition to its antipyretic effects affords considerable relief to the feeling of chilliness and the pains affecting the body generally. Mild laxatives should be given one or twice during the first three or four days of the illness, though the value of attention to the emunctories should be kept in view through the whole course. On account of the weakness and inability of the patient to take exercise the diet should be of a light and easily digested form, such as gruels with sweet milk, light soups, beef-tea, and eggs and milk whipped together, light bread, &c. Alcoholic stimulants given in moderate quantity and regularly are

highly beneficial in such an enfeebling disorder as influenza, the mental and physical energies being usually for a considerable time alike depressed. The headache whether catarrhal or nervous, seems to be relieved best of all by a combination of the salicylate of Sodium and bromide of potassium, or antipyrin and the bromide of potassium, the vehicle containing the Syrup of lemon or glycerine when there is a dry cough or sore throat. The headache is sometimes further relieved by the local application of a strong evaporating lotion consisting of equal parts of vinegar, alcohol, and cold water applied frequently, or by means of a folded handkerchief or other soft

material, the effect being soothing and refreshing. Complications have to be treated as for their own affection, and the treatment modified according to circumstances.

When the patient has passed through the acute symptoms vegetable or iron tonics such as Quinine bark, gentian mix Berberis &c combined with the mineral acids and made as palatable as possible, should be administered half an hour or so before meals.

The sick chamber should be sprayed daily during the illness with some form of disinfectant, a combination of a weak solution of Carbolic Acid (1-60), Hydrag-bichlor (1-1000) and the spirits of camphor having proved

germinal properties, being agreeable to the patient, and the strength of the solution being so graduated as not to be injurious to the furniture. When the patient has reached a safe stage of convalescence nothing will better accelerate his recovery than change of air to a locality suited to the individual requirements of the case.

Finally, when the patient has thoroughly recovered the sick-room and all its contents ought to be thoroughly disinfected.

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