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I N F L U E N Z A

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I N F L U E N Z A

Although this interesting malady, now about to be considered in detail, has from very early times excited the greatest medical interest, and not infrequently general consternation in its ravages, it is within comparatively recent years that many of its peculiar characteristics, more especially by bacteriological and statistical methods, have been properly and scientifically investigated, the same in connection with recent epidemics.

The investigation of such a varied and pandemic disorder is naturally one bristling with difficulties, the chief one being to recognise exactly what to accept or reject as influenzal from the bewildering accumulation of literature on the disease. Our researches to be of practical utility must be comprehensive as well as selective, so many ailments not necessarily described as such, being of influenzal aetiology, and others again, such as slight pyrexia with catarrhal symptoms being erroneously described as influenza and included in the statistics of the disease. It is injudicious therefore, to be very dogmatic in our assertions as to this or that symptom or feature being pathognomic of the disease.

We shall see later how the great honour of the discovery of the influenza bacillus belongs to Pfeiffer, his results shortly afterwards confirmed, and the various investigations at the time being published in the Berlin Report by Von Leyden, and the exhaustive Local Government report by Parsons.

One of the best expositions of the disease is to be found in Leichtenstern's article in Nothnagel's Handbuch, and the same has been freely utilized in this composition.

Definition.-

To be anything like satisfactory, this should include the salient features of the disease, or at least the more important part of them. The following, perhaps, will meet the requirements of most:-

Influenza is a specific, contagious, febrile disease, of undoubted epidemic character, and usually ushered in by sudden symptoms of catarrhal affection, pains in the lumbar region and body generally, frontal headache or delirium, followed by pyrexia, anorexia and complete prostration. It is due to a pathogenous bacillus, and has many complications such as pneumonia, bronchitis, pleurisy and meningitis.

Nomenclature.-

The term "Influenza" is said to have originated in Italy about the year 1741, and was supposed to have been produced by an "influence" of the stars - hence its title.

It has, however, received many other names of which the following are illustrative:-

"Russian Influenza" is the name often given to the disease in this country, and in Europe generally.

"La Grippe", in France: "Grippe" in Germany.

"Chinese Fever", by the Russians from its supposed origin in Chinese territory.

"Epidemic Catarrh" is an English synonym, but a particularly unfortunate one, as the presence of catarrh, as will be noted later, is in no respect an essential feature of the disease.

"Feverish Cold" is the name sometimes given to it by patients and others, in ignorance, perhaps, of the fact that colds are not necessarily of influenzal origin.

"Catarrhus a Contagio" is one of the synonyms for Influenza given in Cullen's Synopsis Nosologiae Methodicae.

"Misery Fever" and "Sweating Sickness" are terms used in some of the older publications, their origin being far from certain. In view of recent research, the latter name is a particularly unfortunate one.

"Centro-neural Fever" is a name used in connection with influenza in the Lancet, vol. ii, 1891., and has little that is scientific to commend it.

BACTERIOLOGY OF INFLUENZA.

To Pfeiffer belongs the great honour of having discovered the micro-organism of influenza in the year 1892. (Vor-

laufige Mittheilungen über die Erreger Influenza, Deutsche Medicinische Wochenschrift, 1892, 2.) His discovery resulted from the observation of some thirty-one cases of the disease in each of which he was able to detect the bacillus present in the bronchial secretion, and from it obtained an abundant culture. It was also to be found in the peribronchial tissue and even in the pleural cavity, in the former case causing pneumonia, in the latter pleurisy.

In influenza alone is Pfeiffer's bacillus to be found. It disappears on the cessation of the catarrh, and consists of minute rods with rounded ends, about half the length of the bacillus of mouse septicaemia, of the same thickness, and with a tendency to form chains, thus being apt to be mistaken for pneumococci. They are non-motile and aerobic, staining well with carbol-fuchsin, and being decolorised by Gram's method. The highest temperature at which the bacilli will grow is 42° C., and the lowest 28° C. They are apparently incapable of spore-formation, and consequently difficult of cultivation, the best medium for that being human blood, and rabbits' next. It is noteworthy that they will not grow in blood serum.

Their cultivation properties can be well demonstrated by using glycerine-agar plates streaked with fresh blood in the usual way (vide Curtis' Essentials of Bacteriology, 1900, pp. 217 & 218), an emulsion of the sputum in nutrient broth being inoculated on the surface of this, as first suggested by Abel, and recommended by Foulerton.

Another plan is that of Hewlett (Manual of Bacteriology, p. 281) of causing the patient - his throat having been previously gargled with hot water - to expectorate into sterilized test tubes.

The colonies - which according to Kitasato never become confluent - appear in about two days in the form of small translucent dewdrop points, requiring a lens for their detection.

The bacilli each measure about 0.2 m.m. transversely, and 0.5 m.m. longitudinally. They occur singly, or in chains of two, three, or four elements; they manifest but little resistance to heat, and are destroyed after an exposure of five minutes to a temperature of 60° C.

Canon (Über einen Mikro-Organismus in Blute von

Influenza Kranken, Deutsche Medicinische Wochenschrift, 1892, 2.) also claimed to have discovered the influenza bacilli in the blood of patients suffering from the disease, but his statement of having been able to cultivate them by merely allowing the pricked finger to bleed into a petri-dish of glycerine-agar has not been verified by the experiments of others. For actual demonstration in the blood, Canon recommends fixing in films with absolute alcohol for five minutes, the bacilli being thereafter stained with a mixture resembling that of Chenzinsky, as follows:—

Concentrated aqueous solution of methylene-blue
40 parts,
Eosin (1% solution in 70% alcohol) 20 parts,
Distilled water 40 "

Using a watch glass, float, for three to six hours at 37°C. the cover glass; then wash in water, dry, and mount in balsam. The red blood corpuscles stain pink, and the leucocytes, bearing the bacilli, blue.

An interesting feature is the resemblance of the bacilli to pneumococci in the deep staining of their ends with dilute Ziehl's solution of carbol-fuchsin (or methyl-blue), as has been already noted.

Being aerobic, the bacilli require a certain amount of moisture for their growth. They can live as far as fourteen days in the sputum, but can be quickly destroyed by dessication; whole colonies thus terminate their existence in a few hours, but take for this as long as forty hours if in the sputum and not so treated.

A properly prepared slide preparation of the greenish-yellow muco-purulent bronchial secretion shews crowds of Pfeiffer's bacilli, and this crowded appearance is very easily recognised, and held to be pathognomonic. In post-influenzal phthisis they can be detected in the sputum for months, existing side-by-side with the tubercle bacilli.

Monkeys and rabbits can be inoculated with the bacilli of influenza with great facility, but other animals are, however, somewhat more resistant. Pfeiffer and Beck were able to produce symptoms of influenza in monkeys by rubbing the material containing the bacilli into the nasal mucous membrane, and also by injecting it into their lungs.

History of the Discovery.-

Julius Althaus was one of the earliest to investigate the various phenomena of influenza, and his researches are especially noteworthy. In his interesting treatise on the disease (p. 11.) he gives vent to his firm belief in what he considers to be the toxic origin and nature of influenza as regards the peculiar symptoms produced by the bacillus, its toxine being responsible for every variety.

Researches, with more or less contradictory results, were conducted, prior to those of Althaus, by well-known observers, such as Ribbert, Finkler, Gruber, Klebs, and Weichselbaum. The special task of each was to investigate the morphology of the bacillus, and the nature of its toxine; but it remained for Pfeiffer, Kitasato, and Canon, to clear up their difficulties and thereby place our knowledge of the disease upon a more scientific basis.

Pfeiffer, as already shewn, found the bacillus to consist of minute rods, measuring about half the length of the microbe of mouse-septicaemia, and existing either separate, or after the manner of a chain. He found it to be peculiarly susceptible to certain stains, such as Löffler's methylene-blue, producing under the microscope the appearance of a diplococcus or streptococcus. As one or other of these the bacillus had apparently been described by the earlier observers already referred to.

Kitasato (Über den Influenza Bacillus und sein cultur verfahren, Deutsche Medicinische Wochenschrift, 1892, 2.), believed that the non-recognition of the influenza bacillus was entirely due to the great difficulty experienced in obtaining pure cultures: even Pfeiffer could not cultivate them beyond the second generation. The same, in all probability, was due to the great preponderance of the other organisms in the material observed, the great army of which, as it were, entirely overwhelmed and obscured the influenza bacilli.

Kitasato was ultimately able, however, by an original method, to effect their cultivation even to the tenth generation, by which time the colonies appear in the tiniest units. From these culture units others always separate and can be reared on agar-glycerine, when the avoidance of aggregation into continuous rows of itself distinguishes the influenza bacilli from all other bacteria.

During an attack of influenza, the bacilli are found to swarm in the sputum, from which they can readily be obtained and

cultivated; so also from the pleural effusion and lung substance, into which, we have already noted, they have the power of penetration.

C a n o n (Über einen Mikro-Organismus im Blute von Influenza, Kranken, Deutsche Medicinische Wochenschrift, 1892, 2.) was perhaps the first to obtain the bacilli from the blood of patients suffering from influenza, which fact has been put to diagnostic use as follows:-

A drop of blood is obtained from a pin-prick of the finger, and received on a clean cover glass, which is then placed upon another one, the two cover glasses being then drawn apart, thoroughly dried, and placed in absolute alcohol for five minutes. They are next stained with Czenzynke's solution, which consists of a concentrated solution of methylene-blue; $\frac{1}{2}\%$ eosin solution (dissolved in 70% alcohol) 20 grammes; and distilled water 40 grammes. The cover glasses, immersed in this staining solution, are placed in an incubator at a temperature of 98.6° F., and left there for from three to six hours: after which they are washed with water, dried, and embedded in Canada balsam. The red blood corpuscles appear red, the white ones blue, but are easily distinguished by their appearance, and their minority, viz. from four to twenty.

It is easy, therefore, to understand the great difficulty of obtaining a pure culture of the bacilli from the blood, the more so as they are apt to be obscured by its coagulation. Canon's method was to first of all clean and disinfect the finger with a solution of corrosive sublimate, followed by alcohol and aether. The finger was next pricked with a needle, previously sterilized by heat, and a few drops of the blood squeezed into a Petri's dish, and the whole placed in an incubator for 48 hours, at a temperature of 98.6 degrees F. Even after 24 hours of such treatment, the colonies are discernible; and, at the full time, very distinct.

Canon's results agree in the main with those of Pfeiffer, and were confirmed by Klein: so that we may consider this diagnostic method as being thoroughly reliable.

B a b e s (Über die bei Influenza gefundenen feinen Bakterien, Deutsche Medicinische Wochenschrift, Feb. 11, 1892.) was, however, inclined to doubt that Pfeiffer's bacillus is the sole cause of influenza, and believed that some of the other bacilli present in the sputum and secretions may have to do with the disease. In spite of this, authorities are now

agreed that the disease is always conveyed by the bacillus-bearing expectoration, the disinfection of which would with practical certainty stamp out influenza.

Life Expectation of the Bacillus. -

In all probability it can exist for a lengthy - but uncertain - period in the sputum (dry), and at any subsequent period excite an outbreak of the disease: thus accounting for the revival of an epidemic in a locality months after it had apparently disappeared. We shall presently see how the bacillus, like that of scarlet fever, can be conveyed by fomites. So far as can be ascertained, the existence of the bacillus terminates with the fall of temperature below a certain point.

Composition of the Toxine. -

This is a somewhat disputed point, although we are, of course familiar with its virulent nature, and have occasion during epidemic times to view with alarm its enormous mortality. Influenza probably carries off more patients in the year than any other febrile disease - at least in this country. Until comparatively recently, influenza, as a distinct disease, was supposed by many authorities to exist only in the imagination of certain practitioners; witness Broussais's statement in the Clinical and Therapeutic Review of December 1889 that "influenza is an invention of needy people, of doctors without patients, whose time hangs heavily on their hands, and who amuse themselves with inventing such a bogey".

Comparison with Pneumonia. - One can hardly help being struck by the great resemblance between influenza and pneumonia, as regards the course run by each. The question was fully thrashed out by G. and F. Klemperer (Verusche über Immunisirung und Heilung bei der Pneumococcus-Infektion, Berliner Klinische Wochenschrift, August 31, 1891.), who found that the intensity of the attack was due to the strength or quality of the poison secreted by the bacillus, and not to their number. These two observers were able to extract the pneumotoxine, in the form of a pale yellow amorphous powder, of an albuminoid nature, by precipitation of the diplococci with absolute alcohol (killing the parasite), and subsequently dissolving the precipitate in water, and evaporating it.

Injection of a solution of the toxine was either fatal to rabbits, or caused severe febrile symptoms or systemic disorder. We may, therefore, conclude that it is the circulation of the toxine throughout the body which causes the pneumonic symptoms. Its invasion of the central nervous system may be held to be productive of the great depression of pneumonia. Soon afterwards, an antitoxine is formed in the blood which neutralizes the toxine, and the patient recovers; but if the amount of antitoxine formed be insufficient for such neutralisation, only a slight fall of temperature occurs, and the benefit obtained is only partial. After the crisis, injection of the serum of a pneumonic patient was found to confer an immunity upon them.

Again, Pacini (Reforma Medica, Jan. 7, 1892.) claims to have cured a case of tetanus by the injection of the tetanus antitoxine, discovered by Tizzoni and Catani (Über die Art, einen Thiere die Immunität gegen Tetanus beizubringen, Correspondenz-Blatt für Bacteriologie, 1891, 6.).

Consideration of the foregoing leads us to hope that in time an anti-grippe-toxine from the blood of influenza patients containing the toxine after the crisis of the disease is over - presuming, of course, the antitoxine to be of insufficient quantity to neutralize all the toxine, the surplus toxine forming the so-called antitoxine.

D u r a t i o n o f I m m u n i t y . -

The patient continues to be immune for a longer or shorter time, until all the antitoxine in the blood serum is used up; so that, with the next exposure to infection, he may contract the disease, and so on a second, third, or more times.

G e n e r a l C o n c l u s i o n s . -

- (1), The attack of influenza is due to a specific bacillus, viz. that of Pfeiffer.
- (2), The severity of the symptoms is due to the intensity of the secreted toxine.
- (3), The crisis of the disease is due to the antitoxine neutralizing the toxine.
- (4), The excess of the antitoxine confers a certain amount of immunity.
- (5), With the exhaustion of the antitoxine the disease may be contracted a second or a third time.

P A T H O L O G Y A N D M O R B I D A N A T O M Y
O F I N F L U E N Z A.

Our knowledge of the morbid anatomy is hardly so complete as one might expect from the large mortality, probably due to the fact that so few influenza patients enter the hospitals, where chiefly facilities for post mortem examination of the viscera are to be found, and appearances produced by influenza recognised.

One of the first observers reporting upon the post mortem appearances was Dr. MacDonald of the Dorset County Asylum, who, in the Lancet of March 12th., 1892 described an autopsy which he held on a patient who had fallen a victim to influenza. Referring to the appearance of the brain, he stated that the pia mater was thickened and excessively congested; there was an excess of sub-arachnoid fluid, and a more or less general cortical hyperaemia. By far the most remarkable appearance, however, was an intense congestion - almost amounting to capillary haemorrhage - of the medulla. The patient had died from influenzal broncho-pneumonia after an illness of five days, attended with high temperature and general prostration. Curiously enough, intractable vomiting was the predominant clinical feature. Further enquiry by Althaus elicited the fact that the patient was a general paralytic, who suffered from an attack of influenza during five days, the same being attended by pyrexia, vomiting, and general prostration. The autopsy was made sixteen hours after death, when the dura mater was found to be slightly thickened and excessively congested. The venous sinuses were distended with fluid blood. There was a considerable amount of thickening and engorgement of the vessels - especially at the base - and the arachnoid fluid was found to be greatly in excess of the ordinary. The cortex of the brain was pinkish and hyperaemic. A few surface ulcers were to be seen in the motor area. On section, the cerebrum was soft and wanting in consistence. The central ganglia shewed no special lesion. The membranes surrounding the medulla, especially the ependyma on the floor of the fourth ventricle, were more highly vascular than ordinary, and than elsewhere; and the bulb itself was not only congested, but the vessels seemed full to bursting. Section of the medulla shewed this hyperaemia to be greatest - or at any rate most intense

noticeable - immediately under the floor of the fourth ventricle. In the centre of the bulb the arterial congestion shewed itself in irregular and tortuous areas, suggestive of following the outlines of the blood channels, nuclei, &c. There was no macroscopic softening of the bulb; but the pons was decidedly congested.

With the exception of the lungs, the other organs were fairly healthy. Regarding the former, the condition was that of broncho-pneumonia.

The Respiratory Passages.-

As influenza is fatal only by its secondary effects upon organs and tissues, one can hardly describe any characteristic appearance produced upon these channels. In the catarrhal variety of the disease, we may notice post mortem signs of widespread hyperaemia, and catarrhal swelling of the respiratory mucous membrane, from the nostrils to the bronchioles, and the same sort of condition, of course, in the gastrointestinal variety, in the stomach and intestines &c.

Ribbert (Deutsche Medicinische Wochenschrift, 1890, No. 15; No. 5; Nos. 4-15.) has shewn how the mucous membrane of the larynx and bronchi macroscopically present an appearance of redness of varying intensity, and, with the trachea, are found to be usually smeared with a tenacious grey, or yellowish-green mucus. Microscopically, he describes a cellular infiltration of the mucosa, together with an engorgement of the blood vessels - such appearances conveying the impression of an erysipelatous process. This is strengthened by the fact of these catarrhal changes tending to spread from the nasal passages and pharynx to the larynx and trachea and bronchi; or in the reverse direction outwards from the bronchi to the larynx, pharynx and nose.

The Lungs.-

The appearances presented are those of bronchitis and pneumonia, but are not exactly what one might consider to be characteristic. Many observers, however, have placed their experiences in investigation on record.

Graves (on Dr. George Green's authority, quoted by Goodhart in Allbutt's System of Medicine, 1898, p. 695.) has recorded that "the bronchial mucous membrane was found in every case more or less congested and inflamed"

The inflammation in most cases occupied the trachea and the bronchial tubes of both lungs A sanguinolent frothy mucus occupied the area of the tubes, and increased in quantity as they were traced to their minute divisions. The parenchymatous tissue of the lungs was invariably discoloured, and it did not crepitate, or very feebly so, when pressed between the fingers. The surface of its section was rough to the touch, and when pressed on the hand a quantity of the mucus described was driven out..... The signs of recent pleuritis were rare".

Louis Hayne (Practitioner, vol. 53, No. 4) agrees in the main with the appearances described above, and quotes Ribbert of Berlin to the effect that "the hepatisation on section has a peculiar smooth aspect of acute croupous pneumonia. Sometimes there is a marked interstitial inflammation, explaining perhaps the tendency to abscess and pulmonary gangrene. This peculiar smooth aspect has been frequently observed in deaths from recent epidemics, as has also the association with it of areas of broncho-pneumonia. Often the solid lung looks as though it were composed of a number of patches of broncho-pneumonia consolidation, these patches having run together and involved the whole lung, suggesting the appearance of a confluent broncho-pneumonia rather than that of the croupous variety of pneumonia..... This is often found in conjunction with red hepatisation..... In some cases pale patches of broncho-pneumonia are scattered throughout the lung so as to suggest at first sight the existence of miliary tubercle. As regards the bronchi, inflammation of the larger tubes is very common, besides the capillary bronchitis, the bronchi being congested and covered with thick mucus. The tubes are generally filled even to dilatation with muco-pus. The whole thickness of the bronchial wall is softened. Sometimes the contents of the bronchial tubes are not muco-purulent, but fibrinous".

Goodhart (Allbutt's System of Medicine, vol. 1, p. 697.) attaches little importance to this smoothness of surface, having seen it in many cases of irregular pneumonia. He attributes it to a want of intensity in the exudative process; or again, to the occurrence of mixed forms of inflamm-

ation, particularly in the direction of interstitial changes and nuclear proliferation, associated with collapse of the spongy structure of the lung. Most observers agree with Goodhart's views as this acute bronchp-pneumonic condition is exceedingly common during epidemics of such diseases as measles. The interesting point is that ordinary acute broncho-pneumonia is a rare disease of adults, but a very common complication of influenza, associated with patches of lobar pneumonia, but differing from ordinary pneumonia in being smooth instead of granite-like and granular. The condition found is more of a splenification than an hepatisation.

The Pleura.-

An ordinary pleurisy, with or without effusion, may be found, the bacilli having penetrated from the bronchi and pulmonary substance.

The Heart.-

Thrombosis may be found in its cavities. There may also be evidence of endocarditis or pericarditis, and the myocardium may even be in a state of fatty degeneration. (Weichselbaum, *Über Infl. und ihre Complicationen*, *Weiner Medicinische Blätter*, 1890, 6.).

The Spleen, Liver, and Kidneys.-

In severe attacks of influenza, a congestive state may be found.

The Central Nervous System.-

We have already produced evidence to shew how the the disease may affect this locality; and the subject will be more fully discussed later on. It is well worth noting, however, at this juncture, that the bacilli have been detected in the blood vessels of the brain and spinal cord; and that Foà of Turin has found numerous haemorrhagic patches throughout the substance of these organs. (*Sulle alterazione del midollo spinale nell'Influenza*, *Il Policlínico*, 1890, No. 5.)

E T I O L O G Y O F I N F L U E N Z A .

Although points bearing upon this important and interesting question will be discussed hereafter, a brief survey of the variety of opinions expressed may not be out of place here.

The Miasma Theory.- Considerable attention was attracted to this by the Hon. Rollo Russell who, in January 1890, wrote to the London Times his famous letter, with the intention of proving that the great pandemic of 1889 - 90, in this country, was in reality due to the diffusion of atmospheric dust in the wake of the great flood which had occurred in the Chinese territory irrigated by the Hoang Ho, or Yellow River. His views at the time attracted great attention, but are now discredited, even though E. Symes Thompson went the length of admitting that the dust, no matter of what origin, might form the vehicle, or "raft", for the conveyance of the bacillus, thus allowing a local epidemic to become a pandemic. This view was also countenanced by Sir, J. W. Moore, (Brit. Med. Jour, 9th May, /91). The supporters of the miasma-theory point to the great epidemic in China in 1890, lasting in the northern regions in 1891. In the month of March of that year it appeared in several large towns of the United States, and extended over the ocean to Norway, some 900 cases being reported in Christiania in one week. At the same time it became epidemic in Sweden, especially at Gotenborg. About this time, a severe epidemic raged in Yorkshires and Bingleyshire, from thence extending itself through the Midlands into East Anglia.

An attempt at explanation of the course taken by the epidemic is made on the supposition that the air-currents (caused by a winter barometric depression over the North Pacific) blew the bacilli from China, across the sea to North America; thence being distributed along the East Coast by the north-west winds of the American winter anticyclone, or area of high atmospheric pressure which results from the piling up of masses of cold dense air over the land in winter, (Moore, Encyclopaedia Medica. vol. v. 1900. p.259).

Similarly, the epidemic of North West Europe was

believed to have been caused by the spring anticyclone over Scandanavia and the Norwegian Sea. The Daily Weather Report of the Meteorological Office London shows that, from the 1st, to the 25th of April, 1891, localities. Under such circumstances, easterly or north-westerly winds - descending from the higher strata of the air, and hence so keen and dry - played upon the very districts in Sweden and Norway, and England, which were simultaneously affected with epidemic influenza.

The paradox of the influenza travelling from east to west in a direction opposite to the winds prevailing at the surface of the earth, is explained by Buchan (Influenza and Weather of London, Brit. Med. Jour. 22 Aug. 1891) on the supposition that the infective material is carried by the ascending currents into the upper regions of the air, where currents prevail in different directions from those at the surface of the earth, and are brought down again in other places where descending, or anticyclonic currents exist.

The Miasmatic-Contagious Theory.- Several observers, notably Dr. R. Duflocq of Paris (Revue de Médecine, t. X, p. 35. février, 1890) are inclined to believe that influenza is more of a miasmatic - contagion than a purely miasmatic disease, the bacilli producing their toxic effects chiefly by direct transmission, but also through the air.

The Contagious Theory.- It is now a recognised fact - and we shall say more on this point later - that the origin and propagation of influenza are entirely independent of Climate, weather, and season, which alone will distinguish the disease from epidemic bronchial catarrh. Unlike other specific contagious diseases, one cannot attribute directly an outbreak of influenza to bad sanitation, overcrowding, and the like, although anything of that nature leading to a lowering of the vitality of the individual, would predispose to an attack of the disease, which rages during epidemics as much in the fashionable quarters as in the slums.

Therefore, the spread of influenza can only be explained on the ground of its being a purely contagious disease. It may also be conveyed indirectly, like Scarletina, by

fomites, of which mode a good example is given by Baumler, (Uber die Influenza 1889 - 90. Verhandlungen des neunten Congresses für interne Medicin zu Wien, 1890, Münchener Medicinische Wochenschrift, 1890, 2.) He points out how the first case of the epidemic at Basle was a man who had just unpacked a bale of goods, from the Magazine du Louvre in Paris, where the disease was at that time raging.

A further instance of the propagation of the disease by packages is given by Finkler (Deutsche Medicinische Wochenschrift, 1890, 5.) "An Officer of the ship Bretagne, which was anchored in the harbour at Brest in December 1889, became ill at his home in Brest on the 11th December, three days, it is said, after the arrival of a number of packages from Paris, which were first unpacked by the Officer, These packages then carried the disease to his ship, while the vessels Borda and Austerlitz, which were anchored beside this vessel, are said to have escaped the infection.

Incubation Period.— A good deal has been written upon this important question, but the concensus of opinion is in favor of placing it at two days on the average, but many instances of variation one way or the other are on record. Moore (Ency. Med., vol. v. p. 271.) described how a lady was seized with influenza so soon as three hours after exposure to the infection, Geo. Neale also contracted the disease one house after visiting a case. (L. G. B., Eng. Report on the Infl. Epid. of 1889 - 90.) The limit of the incubatory period seems to have been seven days.

S Y M P T O M S O F I N F L U E N Z A .CLINICAL FEATURES.

After feeling "not quite himself" for a day or so, the person attacked is hurled suddenly into a state of general discomfort and dejection of spirits. He feels alternately hot and cold., or generally chilly, or may even have rigors of an ague-like character. He complains of pains all over his body, especially at the nape of the neck, small of the back, knees, intercostal region; and the discomfort in the joints, especially the knees, may be so intense as to resemble rheumatism. There will also be headache, and pain behind the eyes, which are exceedingly tender on pressure. The severity of the attack may render him almost deaf, and lead to perversion of the sense of smell and taste. The eyes are frequently swollen and tearful, and there may be great photophobia. The patient may refer the headache to the occipital region, and he may suffer from intense earache.

The sudden loss of strength is very observable and characteristic, and the patient is not long in taking to his bed.

The temperature is found to be elevated two or three degrees, and the sufferer feels as if he were "burning like a fire all over".

The co-existence of a high temperature (101° to 103° F) in the early stages, has been noted by Farbestein in connection with a slow pulse - 80 or under. He has, therefore, made it a rule to take the temperature in all cases seen within twenty-four hours of the onset of the symptoms, and in no case has he found a temperature below 104° F., or a pulse below 88. He says that, after the first twenty-four hours the pulse-temperature ratio becomes variable, and may have returned to normal. Farbestein strongly advises practitioners to bear these facts in mind in diagnosing a doubtful case.

The appetite is almost entirely lost; the tongue is coated with a thick white fur, an unpleasant taste in the mouth is complained of; the bowels are usually constipated, but there may be severe diarrhoea instead, and the abdomen may be in a state of flatulent distension.

The urine is scanty, and loaded with lithates, and presents the usual appearance as met with in pyrexia.

In some cases, the ~~brunt~~ of the attack falling upon the respiratory system cough, profuse or scanty expectoration, a sense of heaviness in the chest, or dyspnoea.

The patient sometimes suffers from distressing palpitation, and may have syncopal attacks.

Should he be subject to any other disease, such as indigestion and bronchial catarrh, it is sure to be aggravated - the influenza as it were finding out the weak spot in the patient's constitution.

Nervous symptoms are apt to develop in those of the neurotic diathesis; the patient may become exceedingly nervous fearing that he is going to die, or may be attacked with excruciating neuralgia.

Although Influenza often goes by the name of "Epidemic Catarrh", the presence of catarrh is by no means essential to it. Sir William Gairdner, commenting upon the epidemic of 1862 says :- "Although a fever and not a catarrh, Nay, the catarrh may be absent or insignificant; not infrequently it is so." The same view is taken by Sir Samuel Wilks, who draws attention to the fact that, "Although a synonym for influenza is "Epidemic Catarrh" the latter was by no means a common symptom; many of the worst cases (1847), and especially the fatal ones, having no catarrhal symptoms whatever". The absence of catarrh is testified to by many other writers, but one more illustration will suffice to prove our contention. The Report of the Royal College of Physicians of London on the Influenza Epidemic of 1782 states that, "the symptoms which universally prevailed, and which appeared to be almost a pathognomic of the disease, was a distressing pain and sense of constriction in the forehead, temples, & sometimes in the whole face, accompanied with a sense of soreness in the cheek-bones. This, now and then, was felt

previously to the catarrh, and not infrequently was followed by very little or no catarrhus affection."

Later in the disease, the prostration and bronchial catarrh are the most prominent symptoms, but the chilly condition is often manifest at times.

The heated condition of the skin and subsequent perspiration may lead to sudamina: and there may be an herpetic eruption about the lips, with a watery secretion from the nose, later becoming muco-purulent.

In a comparatively small number of cases, a definite rash may be noted, in appearance resembling that of measles or scarlatina. It may be papular or erythematous, disappears on pressure, lasts for from one to four days, and is followed by desquamation, within 48 hours of its appearance, of a degree sometimes so slight as to be hardly noticeable; or, on the other hand, surpassing even that of scarlet fever. The rash usually appears about the second or third day, on the cheeks and neck, spreading to the trunk and limbs, being especially conspicuous on the inner aspect of the legs. When papular, its components are closely set; is attended with intense itching, and may last so long as two or three weeks.

Soreness of the throat is a very common symptom, and the voice is frequently very husky. The difficulty of breathing and the cough are apt to become aggravated, and auscultation may discover signs of bronchitis or incipient pneumonia: there may be profuse epistaxis.

The case becoming worse, the tongue may be very dry, reddish-brown, the face livid, the features pinched, and the nausea more aggravated. Diarrhoea may now set in, and the patient lapse into the typhoid state, and die comatose.

In a mild case, the disease is at its height on the second or third day, and from thence gradually declines: but in severe cases, especially the respiratory, the fever may last to the 12th day. The convalescence in such cases is sure to be tardy, and frequently unsatisfactory, from the risk of some other disease seizing hold of the patient's already debilitated constitution: one has to especially beware of pneumonia.

The cardinal symptom of influenza appears to be the excessive weakness out of all proportion to the severity of the disease.

Unlike other infectious diseases, an attack of influenza confers no permanent immunity upon the individual, who may repeatedly fall a victim to the disease, even within a few weeks of his recovery.

Relapses, are perhaps more common in males, but may occur in others rashly exposing themselves to cold during the convalescence; such cases are more prone to have pulmonary complications, and the symptoms are now much less amenable to treatment than formerly.

L O C A L I S A T I O N O F T H E S Y M P T O M S .

The above are the symptoms commonly occurring in the ordinary febrile type of influenza, and can be attributed to the toxine, as it were irritating the various parts of the body, but especially the nervous system. We constantly meet with patients, in both private and hospital practice, who complain of severe neuralgias, loss of strength, or exhibit a general break-up of the nervous system, all of which they attribute to an attack of influenza of perhaps recent date. On the other hand, neurotic patients may suffer a revival of old neuralgias, on contracting the disease, even though their health may have been normal in the interim. Nervous complications or sequels are more often met with in connection with influenza than any other disease of its kind. The large number of neuroses which we meet being due chiefly to this disorder, is explained by the fact of the majority of the population having at some time or other suffered from influenza. The post-febrile neuroses of diseases such as typhoid, diphtheria &c. can be calculated to a nicety: and are commonly met with in the form of palsies, peripheral neuritis, aphasia, and hemiplegia: diseases of the spinal cord following typhoid: paralysis and anaesthesia of the soft palate: paresis of accommodation; ophthalmoplegia; and the "bulbar crises" of Guthrie, (Bulbar Crises of Diphtheritic Paralysis occurring in Children, Lancet, 18th & 25th April 1891.)

On the contrary, diseases such as optic neuritis, orbital neuralgias, embolism of the central artery of the retina, torticollis, tetanus, stammering, hysteria, and diabetes, are never met with after other infectious fevers, but they have all been experienced as unmistakable sequels of influenza. So also almost any disease of the nervous system.

Comparison of Influenza with Syphilis.

The only other disease which can rival influenza as an etiological factor in the production of nervous disease, is syphilis, although it comes a long way behind it in this respect. The two disorders present many points of resemblance, such as the primary attack, milder secondary symptoms, and serious tertiary - almost incurable - effects.

It is now generally agreed that Influenza has the power of reviving an old syphilis, the brunt of the attack falling on the favourite haunt of syphilis, viz, the spinal cord.

A study of the literature of the two diseases leads one to the conclusion that the toxine of influenza is frequently more intense than that of syphilis. For instance, an attack of influenza will sometimes in a few days convert an optic atrophy into a total and permanent blindness; but we never have this resulting from syphilis, and it would also be amenable to anti-syphilitic remedies.

So also, nervous lesions due to syphilis are always slow in development, but frequently sudden in the case of influenza. Is Influenza a Nervous Fever? Some writers, who ignore the element of catarrh, consider the malady to be a nervous fever of an infectious kind. As catarrh is so often entirely absent, and the neuroses seldom, one can hardly find fault with them.

Graves (London Medical Gazette, vol. xx, p. 10.) holds that the poison of influenza acts generally on the central nervous system, and particularly the pulmonary nerves. He lays great stress on the nervous element in the respiratory disorder, and states that, in influenza the dyspnoea is not always proportioned to the bronchitic affection; in some cases the difficulty of breathing was most urgent, although the air entered into all parts of the lungs with facility, and

where few and unimportant râles existed.. Again, although the presence of a copious and viscid secretion in the bronchial tubes was sure to aggravate dyspnoea, yet it often occurred in patients whose air-passages were very little, or not at all, affected in this way. Bearing on this, Graves describes the case of a fine young woman for whom everything had been done which the best and most skilful practice could devise, but her condition, when he saw her, was desperate, and she died on the following day, yet her chest sounded well on percussion, and nothing could be heard over the whole lung, except a few sonorous and sibilous râles, and the respiratory murmur seemed everywhere nearly as loud as natural.. Of course such a lesion of the nervous influence could not last long without necessarily inducing pulmonary congestion - an inevitable consequence of imperfect aeration of the blood.

V_A_R_I_E_T_I_E_S_ _O_F_ _I_N_F_L_U_E_N_Z_A.

Authorities are by no means unanimous in the classification of influenza, some enumerating as many as five types; we shall confine ourselves to describing the three great divisions of the disease;-

The Nervous or Encephalic Form.

" Catarrhal, Respiratory, or Thoracic Form.

" Gastric, Gastro-intestinal, or Abdominal Form.

Generally speaking, during epidemics about 55% of the cases belong to the nervous type, 30% to the catarrhal, and 15% to the gastric variety.

Such division, however, is made more for the sake of convenience of description, and is purely arbitrary, as one might enumerate a dozen forms of the disease by basing each on some peculiar and frequent symptom. The three types to be discussed differ only according to the localisation of the toxine on different parts of the system. All varieties may, and often do, overlap one another, forming combinations rendering it difficult to classify certain cases, from the general mixing of the symptoms. Hence one seldom meets in actual practice a case of pure nervous influenza. It is almost beyond doubt that all cases

present an element of temperature, so that the inclusion of a "febrile type" in our description is inadmissible.

1. The Nervous Form of Influenza.

The most prominent feature at first in this form of the disease is the fever. A case occurring in the practice of the Meath Hospital (Encyc. Med., vol. v. P. 275) well illustrates the manner of its onset. To quote the patient's own words;— "Friday, 20th December 1889, I went to the Oratoria at St. Patrick's Cathedral apparently in my usual health. Shortly after entering the Cathedral I felt chilled, as if cold water was being poured down my back and legs. When I returned home I warmed myself at a good fire, was given some hot wine and water, and went to bed, then my face and head got very uncomfortable, and pains began in my arms, shoulders, and legs. All night the pains were very bad, sometimes so sharp across the back of my chest that I could have cried out, and, though I felt burning to the touch, the cold water sensation continued, I got no sleep that night. Next day, about twelve o'clock (mid-day), I was given a powder (salicylate of sodium), and in about two hours afterwards another, which put me into a perspiration, The pains in my limbs got better, but my head began to ache badly, and all day I felt very ill. I suffered from great thirst. Saturday night slept better. Sunday morning about 5 A.M. I wished for a cup of tea, but could not take it. I might have been drinking hot water. Sunday evening pains had quite gone. I had no headache, I got up for a while, but felt very weak. For several days I had no energy for anything, the least exertion tired me. My sense of taste did not return for four or five days. I also got a cough which was very troublesome. Temperature — Friday night 101° F. Saturday morning 100°, evening 98° 8' ½

In the nervous form of influenza great depression, and even a suicidal tendency may be met with. The patient seems tired of life, and is pessimistic to an extraordinary degree, though formerly of a most cheerful temperament. Such cases often lapse into a chronic state of apathy and despondency.

One frequently reads in the newspapers of suicides due entirely to a recent attack of the grip, the depression of spirits following such being sometimes frightful.

A peculiar loss of weight has been observed in what, for want of a better name, we may call "Chronic Influenza". An instance of this occurred at the Deaf and Dumb Institution in Copenhagen (Report for 1889.) where the expected increase in weight of the inmates did not occur in November and December, during the time that the Influenza raged in the city. The pupils had not apparently suffered from the disease, but six of the professors were prostrated with it during the months mentioned, and probably infected the former. This would interfere with the metabolism of the pupils, and so prevented the increase in their weight, which periodical weighing during the last seven years shewed to be constant, and to occur with unfailing regularity at that time, and was naturally looked for in 1889. So far as one can gather from the report, the pupils exhibited no abnormality of temperature.

The elevation of the temperature in this form of the disease is nearly always, however, sudden and well-marked, even reaching 103° , or 104° , in rare cases 105° or beyond. The pyrexia presents its usual concomitants of shills, rigors, &c. In ordinary fevers, the higher the temperature the worse the case. This is not always so in influenza the thermometer may register 105° one day, and the patient, after a copious perspiration, be comparatively well the next. The mistake is often made in attributing this to the antipyretic used, but it has been proved that this loss of body-heat will occur just as often when it is not given, though perhaps a little later.

Far from the hyperhyrexia being a trivial symptom, the numbers of deaths on record from it are legion. Interesting accounts of the condition are related by Gibson and Paramore; the latter claims to have seen temperatures of from 105° to 111° , (Lancet, 29th 1891, and Brit. Med. Jour. 19th Dec. 1891.)

Duration of the Fever.— As a rule the temperature remains elevated for a few days — usually three — and is apt to be very fluctuating, frequently remittent, or even intermittent.

Theories of Causation.—

1. The Increased Production Theory.— The supporters of this theory, and they are the most numerous, believe that irritation of the thermogenetic centre in the caudate nucleus causes an increased production of heat, thereby causing the elevation of the temperature. (Hale-White, Guy's Hospital Reports, 1884 & 1890; Hughlings Jackson, Brit. Med. Jour., 26th April 1890. Macalister on Fever, Diet of Practical Medicine, 1890; and treatises of Eulenburg and Landois, and Otto.). Here there is a double nervous mechanism, working in correct harmony, one set of nerves being excited or catabolic, the other inhibitory, anabolic, or regulating. In influenza, the former set of nerves are more active than the latter, with the result that the regulating action of the controllers is kept in abeyance, and destructive bodily metabolism ensues.

2. The Increased Retention Theory.— This was first enunciated by Traube of Berlin, in 1863 from the fact of the temperature being high in the presence of chills, rigors, and pallor of the skin. (Gesammelte Beiträge zur Pathologie und Physiology, Berlin, 1871, vol. 11., p. 637 & 639.). His opinions were supported by Rosenthal of Erlangen, (Die Wärme-Production in Fieber,, Berliner Klinische Wochenschrift, 32, 1891,) who, by hypodermic injections of pyocyanine, tubercular sputum, and infusions of hay, produced a febrile condition in cats. A sharp fall of temperature was next obtained by an injection of antipyrin.

3. The Congestion Theory.— (Vide Hale-White, "The Heat-centre Theory from a Clinical Point of View", Guy's Hospital Reports. 1884, & 1890 on "Brain Lesions and Heat".)

The opinion is now pretty generally held that the pyrexia of influenza is not due to either of the above causes, but to an irritative congestion of the thermolytic centre in the medulla. This centre is believed to regulate the loss of heat from the skin and lungs, by means of its sub-centres — the vaso-constrictor centre for the cutaneous blood vessels, the sudoriparous centre for the sweat glands,

and the respiratory centre for the lungs. The grippo-toxine circulating in the blood is held to irritate these centres, and the fever continues until the amount of antitoxine, sufficient to neutralize the toxine, is formed in the blood serum; only then does the crisis of the disease appear. On the other hand, however, should the antitoxine be insufficient, the defervescence is by lysis, and sequelae are common, owing to the remainder of the toxine continuing to prey upon the system. Hence, it is a clinical fact that the greater the crisis, the quicker and better does the patient recover.

Symptoms of a congestive nature are very common in children attacked by influenza, especially convulsions and paralysés. The disease, again, may be ushered in by symptoms pointing to an actual meningitis with effusion. There may be intense headache, injection of the conjunctivae, swelling of the eyelids, constipation, grinding of the teeth, convulsions, rigidity of the neck, and delirium or coma; but sudden defervescence in a day or two contraindicates the presence of a pure meningitis. (Remarks on Influenza and its Complications, *Lancet*, 29th. August, 1891.).

Structures Attacked by the Congestion. -

In severe cases, the congestive irritation of the toxine may travel from the vaso-constrictor centre in the bulb, along the peripheral ramifications, and so set up diseases such as meningitis, meningo-myelitis, ophthalmia, double optic neuritis, glossitis, otitis, peritonitis, thyroiditis, endocarditis, myocarditis, nephritis, and orchitis. (Vide Mackay, Cervical Meningo-myelitis following Influenza, Necropsy, *Lancet*, August 29th., 1891; Baumler, Über die Influenza 1889-90, Verhandlungen des neunten Congresses für interne Medicin zu Wein, 1890, *Münchener Medicinische Wochenschrift*, 1890, 2; Maillart, Etude Clinique sur la Grippe pandémique, Genève, 1891; Bristowe, Cerebral Suppuration following on Influenza, *Brit. Med. Jour.*, July 4, 1891; Macnamara, An address on Opening the Ophthalmological Section of the British Medical Association, *Brit. Med. Jour.*, Aug. 1891.

The involvement of these more remote organs and tissues is due, in all probability, to their invasion by the bacilli, which set up inflammation there by irritating the vaso-

motor nerves. The occurrence of such diseases as erysipelas is probably due to the illness lowering the vitality of the leucocytes, causing a failure in their phagocytic action upon the atmospheric germs, which now readily gain access to the system.

Headache. -

One of the most distressing symptoms of an ordinary attack of influenza is the peculiar headache, which is often of that terrible kind which forbids sleep and goads the sufferer into delirium. It resembles that of typhoid, but differs from it in its shorter duration. It is usually of a frontal character, but may be referred to the back of the eyeballs, and is aggravated by any movement of these, however slight. The pain may be felt, however, in other parts of the head, and on one or other sides of it. It exhibits great variation in character, such as dull, starting, hammering, neuralgic, throbbing, bursting, and the like. It may be aggravated by light, mastication, thinking, and noises; it usually becomes worse towards sunset; and may persist for a week or two, in a minor degree, after the convalescence.

Its Cause. - The headache is now believed to be due to a more or less congestion of the meninges, or even the cerebrum. If neuralgic, it is due to an actual inflammation of the nerves affected - hence the tenderness on pressure. If muscular, it is due to the same condition in the area affected by the pain. On the other hand, it may be due to a congestion in the frontal sinuses, especially when the feeling is compared to a "Cold in the head". Backache. -

Backache. -

A severe pain in the back - like that of small-pox - is the usual concomitant of the headache. It is quite characteristic, and is referred to the region of the kidneys, and the lumbar muscles generally.

Aches and Pains. -

These occur all over the body, and, as in the case of the headache, are only of two or three days' duration. They induce a feeling of indescribable discomfort in any position of the body, thus preventing sleep.

The muscles of the body may also present a rheumatoid tenderness, and are subject to darting pains - especially those of the lower extremities. The pains are as a rule aggravated by movement, so that the patient has great difficulty in assuming a comfortable position, and is in consequence continually tossing about in his bed.

The patient may also be afflicted with torticollis, muscular twitchings, cramps, and tremors.

Neuralgia.-

When the congestion attacks the spinal membranes, posterior columns, and posterior horns of the cord, certain peripheral spinal nerves are frequently the seat of neuralgias. The nerves most often attacked in this way are the sciatic, median, musculo-spiral, intercostal and ulnar; whilst pain is frequently experienced in the breast, coccyx, testicles, &c., all aggravated by movement or pressure. The neuralgic condition is quite independent of any hyperaesthesia of the skin, bones or muscles.

Delirium.-

Though often met with in the other types of influenza, the headache is more apt to merge into delirium in the nervous form of the disease, and it is especially apt to be an initial symptom in the case of children. It is due to congestion of the cortex, leading to irritation of the grey matter. The delirium may be preceded by fits of absent-mindedness. An interesting case of this condition is related by Ewald, (Über Influenza Deutsche Medicinische Wochenschrift, Jan. 23., 1890.). Cases of the same kind, with or without suicidal tendency, are also recorded by Gynne (Lancet, Aug. 29., 1891.); Joffroy (Délire avec Agitation maniaque dans l'Influenza, Merc. Med., 1890, 13.); Creagh (Lancet, July 11, 1891.); and Kische (Über Infl., Deut. Med. Woch., Jan. 23, 1890.).

Urinary Symptoms.-

There is apt to be polyuria, with an excess of the phosphates - a kind of phosphatic diabetes due to the rapid breaking up of the phosphorus in the nerve tissues.

Influenza in the Alcoholic.-

It is now generally agreed that influenza patients, addicted to alcohol, bear the disease very badly; they are more apt to suffer from delirium tremens at the time, the same being often of a frightful nature. Such delirium may last from 8 to 10 days, instead of from 3 to 4 days as is in the ordinary way customary. Such cases nearly always die, whereas sufferers from the ordinary form of delirium tremens invariably recover, in less complicated. The post mortem evidence is in favour of the occurrence of meningitis with subarachnoid effusion, in the case of the alcoholic form of the same in influenza patients. (Vide Revilliod, Des formes nerveuses de la grippe, Rev. Méd. de la Suisse, romande, Mars, 1890, p. 145; and Van Deventer, Über Influenza verbunden mit Geisteskrankheit. B. für Nervenhe., May, 1890.)

Depression and Melancholia.-

In many cases the patient, instead of being delirious, is depressed, melancholic, apathetic, feels tired of life, and subject to nightmares or insomnia - all of which disappear with the defervescence of the grippal attack.

The condition of prostration, so common in influenza, is most characteristic. How often does one hear the patient say, perhaps years afterwards, "I've never been well since I had the influenza"! It is often accompanied by all sorts of minor ailments, such as headaches, constant lassitude, mental and bodily fatigue, and inability for exertion of any kind. Gowers (quoted by Goodhart, Allbutt's System of Medicine, vol. 1, p. 687.) graphically describes it thus:- "It is an intense feeling of inertia. Every action, physical or mental, requires an effort of the will to initiate and maintain, that is almost painful. Immobility of mind and body alone seem possible, and yet even rest has to be endured, for it brings no freedom from the sense of prostration. So strange and unfamiliar is the state that it seems at first as if it would be only transient, and would be gone tomorrow; but the mistake is realised when day after day, week after week, passes without relief. In perhaps the majority it is only after some months that the natural freedom of untrammelled effort is regained". This condition may last for several years after the attack.

Coma and Somnolence. -

The attack of influenza may either begin or end with coma. An instance of the latter condition is given by Aikman (Influenza in Guernsey, Glasgow Medical Journal, June, 1890.) and occurred in the person of a gardener who, suddenly feeling ill, returned from his work, took to bed, and lay there in a comatose condition, with a pulse of 100 and a temperature of 102 degrees F., for two days; when he suddenly woke up, feeling almost well, with his pulse at 60, and a temperature of 97 degrees F.

Macphail, in the September issue of the same publication, records two cases of coma similar to the above.

Goodhart (Allbutt's System of Medicine, vol. 1, p. 683.) draws special attention to the suddenness of the onset of this peculiar symptom, and instances the case of a medical practitioner who went to bed apparently in his usual health. Getting up in the night to void urine he fell to the ground, and was so weak that he had to be assisted to bed again.

He mentions a second case, that of a man driving in his dog-cart apparently well. He suddenly fell, was found lying insensible with a broken rib. He was picked up, and was able to drive himself home quite mechanically, remembering nothing about the drive. On his arrival home he was so dazed that he wanted to get into bed with his boots on, and was in consequence considered to be intoxicated.

Cause. - Coma and somnolence are due to a more severe kind of congestion than either delirium or insomnia. The grey matter is in reality compressed in these conditions - instead of being irritated.

Other Congestions. -

Paralyses and convulsions are produced when the congestion acts upon the central convolutions of the motor areas; and, in connection with particular nerves, produces such symptoms as giddiness, deafness, anosmia and loss of taste, &c.

N O N A

As bearing upon influenza, a short digression may here be made to touch upon, very briefly, the peculiar disease which goes by the name of "Nona", and which attracted so much attention a few years ago.

The name was given to what was thought to be a new disease which arose in Italy, Bavaria, Switzerland and Russia, and possessing coma as its constant and most characteristic symptom. There were to be found at the time several clinicians who suspected that it was no new disease but simply a new name for a severe form of influenza, typhoid, or smallpox. The numerous reports which were received in this country stated that nona consisted of sudden and irresistible somnolence, coming on during or after an attack of influenza, ending in death in a few days. The following case of Braun's (Was ist Nona? Deuts che medicinische Wochenschrift, March 27, 1890.) will shew pretty clearly what occurs in this remarkable disorder:-

A girl, aged 14, who had been in perfect health, suddenly fell ill with severe fever and violent headache. The same evening, as well as the following days, the parents noticed that the girl, who had hitherto been of a bright and lively disposition, was seized with extreme somnolence: indeed, she slept almost without interruption. When roused, she stared at people as if she were quite absent-minded, did not answer questions, and failed to recognise her friends and relatives. When a cupful of milk was handed to her, and she was asked to drink, she took a few mouthfuls, after which her eyes closed: she dropped the cup, and fell asleep again. The doctor first saw her three days after the beginning of the illness. When fast asleep, she did not put out her tongue when asked to do so, and only muttered some inarticulate sounds instead. The pupils were dilated, and responded sluggishly and imperfectly to light. The complexion and colour of the lips was that of cyanosis. The tongue was dry, and shewed a black fur. Respiration was irregular but accelerated; the pulse likewise regular with a rate of 100. There was high fever and profuse sweating: the excreta had been passed in the bed. More or less rigidity of the neck was present; and any movement of the head, but more especially that of bending it forwards, appeared to be very

painful, and caused sobbing. There was no evidence of paralysis, but extensive hepatisation of the lower and middle lobe of the right lung. There had also been a preliminary vomiting and constipation. It was clear, therefore, that the girl had been suffering from pneumonia, and probably also from cerebro-spinal meningitis; and it was evidently owing to the somnolent condition in which the girl was that there was no cough or pain in the chest: in fact, besides rapid breathing and cyanosis, by the physical signs alone could the presence of pneumonia be detected. The next day the temperature was 104 degrees F.; the pulse 108 and regular; the sweating had ceased. There was also evidence of resolution in the lung, whilst the symptoms of meningitis remained unchanged, and the rigidity of the neck was even more pronounced. During the next two days the condition of the patient became still more critical; convulsive seizures followed one another with great rapidity, and the child died on the sixth day of her illness. Unfortunately, an autopsy could not be arranged.

Other cases, of a similar kind are recorded by such writers as Tranjen (*Die sogenannte Nona, Berliner Klinische Wochenschrift, June 2, 1890.*); Hallager (*El Tilfaelde of None, Hospitals Tidende, 1891, vol. 1x., p. 629.*); and Gillet de Grandmont (*Des accidents qui accompagnent la Grippe, Rec. d'Ophthalmol., Paris, 1890, p. 125.*). The latter, from the intensity of the eye symptoms in his patient, believes that what is commonly called nona, may in reality be an ophthalmoplegia following influenza.

The Crises of Influenza.

Although defervescence occurs by an ordinary simple crisis as already described, it may be of such a kind as to actually endanger life by failure of the heart's action, or arrest of respiration. To these conditions the names respectively of cardiac and pulmonary crises have been given.

(a), Cardiac Crisis.— During an attack of influenza attended by this feature, fainting fits or giddiness are very prominent symptoms. The pulse is sure to be weak, irregular, slow and difficult of estimation; or there may be palpitation, with perhaps pain over the apex of the heart. Consequently, there is marked pallor of the countenance, coldness or dampness of the skin, and a pinched and peculiarly anxious expression. The patient seems to be utterly prostrated and overcome by the disease; and he may lapse into coma and die. Should he survive, however the heart's action remains fickle and disturbed for months; the pulse may be so rapid as to be hardly countable, or, on the other hand, it may be remarkably slow, and the least thing, such as the act of lifting him out of bed, may prove immediately fatal. Usually auscultation shews no cardiac abnormality; but, in other cases, an inflammation of the valves or myocardium may be found.

Goodhart (System of Medicine, vol. 1. p. 382.) gives an interesting ^{case} ~~the~~ illustrative of the cardiac symptoms, which was that of a waiter, aged 35, who drank freely and was suddenly taken ill with influenza. He kept at his work until he had to stop from sheer inability. He was a well nourished man, and presented a pulse of 120. He was found to be panting in bed, with a livid countenance. His general condition resembled that of severe pericardial effusion, but there was no evidence of any increase of the precordial dulness: nor were the sounds muffled in any way. The impulse was diffused and palpable beyond the nipple; the first sound was metallic and flapping in character, but there was no murmur. The other viscera were in good order. These symptoms pointed to a condition of acute dilatation of the heart, with impending death. It is interesting to note that Str-
ychnine, given as a forlorn hope, led to his recovery.

Pawinski (Uber den Einfluss der Influenza auf das Herz, Berliner Klinische Wochenschrift, July 13 & 20, 1891) has produced evidence which goes a long way towards prov-

ing that cardiac crises are more apt to be encountered in the case of patients who have been afflicted with disease of the heart.

(b), Respiratory Crisis.— Death as frequently occurs from this as the former condition. The respiratory crisis is evidenced by a peculiar form of dyspnoea, which the sounds heard with the stethoscope fail to explain. There may also be spasm of the glottis, severe cough, and thoracic pain; the breathing is rapid and laborious, and the patient appears as if about to be suffocated. The absence of any physical signs of respiratory disease, such as bronchitis or pneumonia, renders the condition well nigh inexplicable. It has been referred to the nervous system by a number of authorities, some of whom attribute the phenomena to a kind of paralytic atelectasis of the lungs, consequent upon loss of elasticity in the alveoles, and bronchial paralysis. Huchard (Sur quelques formes clinique de la Grippe infectieuse, Gazette des Hôpitaux, 1890, 18.) holds that it is in reality a state of bronchoplegia. He was led to entertain this opinion from observation of the case of an aged woman who had exposed herself to cold during an attack of influenza, with the result that severe dyspnoea set in almost immediately afterwards, resulting in death within a week, during which time cyanosis was an additional and marked feature of her illness.

2. The Catarrhal Form of Influenza. -

This variety of the disease - which is also sometimes called by such names as "respiratory" and "thoracic" - is generally considered to be due to irritation of the nuclei of the vagus and fifth pair of nerves in the bulb, by the grippo-toxine.

The distinguishing feature of the attack is the general catarrh of the whole respiratory tract. The frontal sinuses, lachrymal glands, lachrymal ducts, conjunctivae, maxillary sinuses, pharynx, Eustachian tubes, tympanum, larynx and bronchi, present evidences of the catarrhal condition - superadded to which may be broncho-pneumonia. In mild cases there may be only a persistent irritative cough, which in certain cases imitates that of pertussis in its violence and frequency, as well as slow resolution; in addition to which there may be little or no expectoration.

Again, there may be a profuse discharge - at first serous, subsequently muco-purulent - from the various mucous membranes, especially from the nose and pharynx: so violent indeed may be the catarrh that the tonsils may slough off, and the voice become lost, or reduced to a whisper; oedema glottidis may set in, and the dyspnoea become even more distressing; the countenance anxious, and the patient seems on the point of death.

This catarrhal variety may be engrafted upon the nervous form of influenza owing to the patient rashly exposing himself to the cold before complete recovery.

Distinction between the Catarrh of Influenza and Common Catarrh. -

<u>In Influenza.</u>	<u>In Common Catarrh.</u>
(a), The inflammation affects the frontal sinuses, &c. as above.	It does not.
(b), Naso-pharyngeal secretion is profuse.	Less so.
(c), Headache, vomiting, &c. all indicate cerebral irritation.	These are absent.
(d), Expression of face denotes great suffering.	Does not.

Peculiarity of Influenza Bronchitis.-

This consists in its development towards the middle of the attack - on the fourth or fifth day, or later. It is of sudden invasion, and is ushered in by severe pain behind the sternum, with great difficulty of breathing out of all proportion to the physical signs. The latter may indicate only an incipient bronchitis, and yet the respirations may be so frequent as 40 or 50 in the minute. The gasping of the patient gives one the impression that death by suffocation is imminent; yet, in spite of this, the sufferer may seem quite recovered the next day. On the contrary, however, the case may merge into one of ordinary bronchitis; or, again, the latter may become very severe, and attended by copious expectoration, and an obstinate hacking cough. The case may then go on from bad to worse, the temperature remain high, and death ensue in due course.

The Rales.- These are of a peculiar sharp character and, according to Goodhart (Allbutt's System of Medicine, vol. 1, p. 386.), are of valuable diagnostic significance. They are extensively diffused over the bases of the lungs, and of medium size. Their quality is sharp, like what one hears in the case of viscidities of the bronchial mucus, thus differing from the rales met with in typhoid bronchitis, which are sibilant musical wheezings, with no great intensity of rale.

The chief danger of the condition is the tendency of the mischief to overspread the entire pulmonary system before resolving. The inability of the patient to expel the secretion is apt to result in his suffocation.

The cough sometimes presents the peculiarity that nothing seems to benefit it; and it may in its paroxysmal character resemble that of whooping cough.

The Pneumonia of Influenza.-

This likewise presents striking peculiarities. Its onset is usually about the fifth day of the grippal attack; it may be single or double, croupous or catarrhal. The pulse is very quick - 100 to 120 - but, according to Goodhart (Allbutt's System of Medicine, vol. 1, p. 385.), for the severity of the illness, it seldom underwent any proportionate acceleration, a pyrexia with one of 80 or 90 being his usual clinical experience of the disease. There is also great pain

in the side of the chest, copious expectoration, a hacking cough, and great depression, followed by a very tardy recovery, or a relapse into ultimate death. It is a peculiar fact that the quality of the expectoration affords no reliable guide as to the nature of the pulmonary mischief. One is frequently struck with the entire absence of rustiness of the sputum, even in the most severe cases. Numerous instances are recorded. (Vide Gray, "Influenza", London, 1897.).

Another form of pneumonia (catarrhal) which is to be met with only in influenza cases, and in both the nervous and the respiratory forms of the disease, is an hypostatic or congestive broncho-pneumonia. It commences about the second or third day, and is due not so much to Fraenkel's diplococcus, as to the streptococcus pyogenes, and the staphylococcus aureus, which same are to be found in the sputum in great abundance. An influenza patient, on the fair way to recovery, on exposing himself to cold, or getting out of his bed too soon, is suddenly seized with broncho-pneumonia, which presents the usual symptoms of the disease.

Forsyth (Brit. Med. Jour., May 30, 1891.) states that he has seen many cases in which the fever seems to have two distinct periods, the course of the one being run in three or four days, the other that of a relapse on the fifth day, the latter being almost invariably fatal.

Simon (Relation between Influenza and Pneumonia, Brit. Med. Jour., June 17, 1891.) lays stress upon the fact that the patient, having to all appearances recovered, the danger of complications may be overlooked. Auscultation may lead to the detection of rales accounting for the continued weakness or tardiness of the convalescence, shivering fits and easily excited perspiration, the latter being very common and varying from a coldness down the back to a drenching profuseness, the same being apt to recur with unabated obstinacy for months. (Vide Goodhart, Allbutt's System of Medicine, vol. 1, p. 686.). Owing to there being, perhaps, no perceptible rise of temperature to indicate this condition, it is of the utmost importance to use the thermometer night and morning with unfailing regularity. In the latter case it may register "04 degrees F., and the stethoscope

may at the same time reveal the presence of small and scattered spots of congestion. Percussion, as a rule, in these cases elicits nothing, and there is seldom any sign of pleurisy. Death is the usual result of such attacks, or failing that, the patient is maimed for life.

Emphysema. -

Has been seen several times by such writers as Mitchell Bruce (Lancet, May 30, 1891.) during the epidemic of 1890.

Nicholson, writing on the complications of influenza in the British Medical Journal of ^{16th. June} ~~May-30th.~~, 1891, says that when pleurisy occurs, the effusion is apt to be of a purulent character.

Part played by the Respiratory Nerves in the Catarrhal Form of Influenza. -

Comparison of the symptoms of ordinary catarrh with pneumonia, and the same occurring during influenza, would allow of our explaining them in the latter case as being due to a congestion of the nerves supplying the respiratory mucous membrane.

The particular nerves involved are the fifth and the vagus. The fifth pair have to do with the nutrition of the upper part of the respiratory tract and the eyes: the mouth, lips, tongue and hard palate. Congestion of these nerves would, therefore, produce a catarrh of the mucous membranes supplied by them, which fact has been proved by experiment. The lower part of the respiratory tract is controlled by the vago-accessory: which, with the fifth pair, freely anastomoses with the sympathetic, and congestion would, therefore, produce the respiratory phenomena described. A very full, and most interesting, account of the latter produced by experimental vagotomy, is given by Julius Althaus in the fifty-second volume of the Transactions of the Medico-Chirurgical Society, page 271.

Haemorrhage occurring in the Course of Influenza. -

Bearing in mind the probability of congestion being the cause of so many of the distressing symptoms of influenza, one can hardly be surprised that bleedings are so often encountered during severe attacks of the disease. The only possible explanation is that the grippo-toxine

irritates the vaso-constrictor centre in the bulb.. It is most commonly met with as follows:-

Haemorrhage from the Nostrils.-

In the male, epistaxis is by far the most common variety of bleeding. Koranyi has seen it in 35% of the cases amongst the pupils of the Honved Military Academy of Buda-Pesth. (Die Influenza Epidemie in Buda-Pesth, Wiener Medicinische Presse, 1890, 7).

The nasal haemorrhage may be so severe as to actually threaten life; this was the state of affairs in two of the fourteen cases treated by Mosler. (Zur Kenntniss der in Griefswald beobachteten Fälle von Influenza, Deutsche Medicinische Wochenschrift, 1890, 8.).

So also, one of Holz's cases nearly died from the severity of the nasal bleeding. (Holz, Schwere Zufälle bei Influenza, Berliner Klinische Wochenschrift, 4, 1890.). Immediate resort to vigorous plugging alone saved the patient's life.

Nelson Gwynne in the course of his 299 cases in Influenza, had occasion to treat for epistaxis in 29 of them. (Lancet, Aug. 20. 1891)

Ecchymosis of the Conjunctivae. may result from the violent coughing; but it cannot be attributed to cerebral congestion.

Haemorrhage from the Ears. is far from being an uncommon symptom. Huag had to deal with it seventeen times in eighty cases of influenza. (Hang, Acute haemorrhagische Paukenentzündung, eine Complication bei Influenza, Münchener Medicinische Wochenschrift, 1890, 3). In all of them, the ear presented unmistakable evidence of inflammation. The membrana tympani was of a livid color, swollen, and covered with ecchymoses, many of them ruptured, and blood oozed from the external ear.

Bleeding from the Lungs. is of common occurrence in influenza patients of a phthisical taint. Wiltschur has drawn particular attention to this; and from his observation of the frequency of haemorrhage from the lungs of consumptives, is of the opinion that, acting through the nerves, influenza is an especial depressant of the lung tissue. (Petersb. Med. Woch. 1890. 5.)

Haemorrhage from the Stomach and Intestines, has been somewhat more rarely encountered.

The Kidneys, may also suffer from the general congestion, and blood be detected in the urine, early in the attack, even in those who have not previously suffered from renal disease.

Purpura Haemorrhagica, has been met with by Pick, (Ein Fall haemorrhagischer Diathese nach Influenza, Prager Medicinische Wochenschrift, 1890.11).

He publishes a most interesting case of an healthy lad of 19. in whom the grippal attack was accompanied with epistaxis, haematemesis, and bleedings from the internal organs in general. Clots of blood were found at the autopsy in the meninges, lateral ventricles, Sylvian aqueduct, fourth ventricle, right occipital lobe, the pericardium, pharynx, and stomach.

Apoplexy. has been met with, but not often. That it has occurred has been proved by finding the clot at the necropsy. (Dücker, über die Ausbreitung der Influenza, Münchener Medicinische Wochenschrift, 1890,6).

Influenza in the Female.— Attention has been drawn to the extraordinary frequency of influenza amongst females, particularly when menstruating, by several writers, notably Anton (Beobachtungen über Influenza, Münchener Med. Woch., 1890,31): and Evershed (The Influence of the Influenza Wave on Menstruating Women, Brit. Med. Jour. Mar, 1., 1890).

The general opinion is that influenza exerts its pernicious action chiefly upon the uterus and its appendages, particularly in producing a sudden and alarming return of the menses, even a day or two after their cessation. So great may the loss be, that it may resemble a metorrhagia, even in women who have long passed the menopause.

Pregnant women are apt to have a miscarriage, should the influenza attack them, and such an event must always be considered as of grave prognostic significance.

3. The Gastric Form of Influenza.

In this form of influenza, in addition to the common symptoms of headache elevation of temperature &c. the disease in simple cases partakes of the form of a gastric catarrh: but, in severe cases, we have perhaps actual gastric crises.

Under the former condition, the patient of course feels very ill, is prostrated, depressed & cachectic. The tongue is coated with a dirty fur (sometimes not), the patient has a very unpleasant taste in the mouth, is flatulent, and complains of headache.

On the other hand, the condition may be a little more intense, and the symptoms be those of a severe gastric catarrh, with the usual epigastric pain, loss of appetite, thirst, pyrexia, and constipation or diarrhoea.

In the still more severe form of gastric, or gastrointestinal, influenza, the patient may be indeed seriously ill, and the gastric crises very much in evidence, just as we have them in locomotor ataxia. The patient is very sick, vomiting later on bile, blood, or mucus. Super-added to this condition - which may be as uncontrollable as it is intolerable - the patient suffers from abdominal symptoms; he has a weak slow pulse, an anxious countenance, and an abdominal pain of such peculiar intensity as to resemble that of peritonitis. Again the symptoms may resemble those of Cholera, in the vomiting, colic, and rice-water stools, which may be as often as twenty in the day. Such patients gradually go on from bad to worse; the voice becomes husky, the legs cramped, or even paralytic, and coma precedes death. Should, however, the patient rally, he remains for weeks as it were between life and death, and it may be weeks before he is quite himself again; and, even then, he has to exercise continual care over his diet, and habits, as the least indiscretion may cause a speedy return of his former disorder.

Several interesting cases, illustrating the above are recorded by; - R. Simon, (Brit. Med. Jour. June 13. 1891)

Probable Cause of the Gastric Crises.

Once again we may have recourse to the congestion

theory for an explanation of these distressing symptoms, especially in view of the origin and distribution of the nerves of the parts concerned.

It is a well-known fact that vomiting is caused, and secretion of urine arrested by faradisation of the central end of the vagus nerve, which appears to regulate, by its branches to the mucous membrane and muscular fibres of the stomach, the contractility and secretory powers of that organ.

The vagus likewise controls the glycogenic function of the liver, and the secretions of the pancreas and intestines. Remembering also the influence of the splanchnic nerves (uniting with the phrenic and right vago-accessory, forming the coelic plexus, arising from which are the phrenic, hepatic, splenic, mesenteric, and renal plexuses) on the blood vessels of the abdomen, one may readily understand how the toxine may irritate the nucleus of the vago-accessory nerve in the bulb, and so give rise to congestion in the abdomen, the shock travelling along the nerve paths just enumerated.

Collapse of Mental and Physical Strength.

This peculiar and characteristic condition is present to a marked degree in the more severe forms of influenza, both during and after the attack. A certain amount of exhaustion is common to all kinds of influenza, and requires special attention during the convalescence, far into which it persists.

This loss of both mental and physical vigour is out of all proportion to the amount of fever present; an ordinary attack of influenza may weaken a person more than any of the other fevers. This condition, however, is more apt to be found in the anaemic, the consumptive, the overworked, the neurasthenic, and those suffering from worry or anxiety, or leading a vicious life. The patient sometimes feels so weak as to be unable to sit up in bed, and there seems little more to be the matter with him than extreme exhaustion. His whole nervous system seems to be

quite unstrung, the circulation unstable, and he may die suddenly of syncope on very slight exertion. The necropsies of such cases reveal little abnormality - perhaps some slight degree of myocarditis, but quite insufficient in itself to account for the sudden death, which we may therefore, presume to be due to failure of the cardiac centre in the bulb.

Recorded cases, illustrating the above, are very plentiful, and to be met with in nearly every publication of importance dealing with influenza, such as Symes Thompson's "Annals of Influenza", 1890; Hamilton's "Memoirs of the Medical Society of London", 1758; Gray's "Medical Communications", London, 1787; and Huxham's "Observations on the Air and Epidemical Diseases", London, 1758.

Probable Cause of the Phenomena.-

Down to the time of Julius Althaus a sufficient reason for the mental and physical prostration was not forthcoming, and none of the older writers attempted to explain it. Althaus ("Influenza," 2nd. Edition, p 77) finds no difficulty in accounting for the phenomena on the supposition that the poison of Influenza attacks with preference the very sources of life - Flourens' "noeud vital" - viz; the cardiac and respiratory centres in the bulb; and this localisation of the poison makes it intelligible why the whole system and constitution of a person is often thoroughly shaken and as it were revolutionised by such an attack. Let us compare the sudden prostration felt on the very first day of grip with the state of things in the beginning of typhoid fever, where the patient often simply feels out of sorts, and is astonished when the doctor orders him to bed. In Influenza, on the contrary, the patient instinctively seeks the bed at once, without waiting for the doctor's orders, as he feels it useless for him to battle against the disease.

A further contribution to the study of the grip was made by J. Mackenzie (Medical Reprints, July 15, 1891) who stated that the influenza of late has not only affected the general health of sufferers, but has led to an excessive number of premature births, as well as imperfect

development of the foetus.

Preference of the Grippo-toxine for the Bulb and its Nuclei-

To explain why the toxine of influenza should elect to exert its virulent action upon the bulb and its nuclei is far from being an easy task, and authorities are by no means agreed thereon. Perhaps the most plausible theory is that of Althaus ("Influenza", p. 78, 2nd. Ed.). He reasons by the analogy of the elective affinity of other poisons for certain portions of the nervous system; such as Ergot, which is well-known to act by preference upon the posterior columns of the spinal cord; and the lathyrus cithera, or chicken pea (a species of vetch) which, on the other hand, act upon the anterior grey cornus. He considers it as admissible that the grippo-toxine should likewise have a preference for a certain portion of the nervous system of vital importance.

Post-mortem Evidence.- Althaus, however, has little opportunity of verifying his conclusions in this respect, as he usually found no signs of congestion in the necropsies of his influenza patients; its absence from the bulb he attributed to the stage of depression which is the immediate precursor of death.

He nevertheless received great encouragement to his views by the researches of others, notably Helweg ("Influenzaens Virkninger &c, Hospitals Tidende, Copenhagen, July 1890.) upon the 41 cases which he treated during the epidemic in the Aarhus Asylum, Denmark - 520 inmates, In all of the eleven cases upon whom he performed autopsies, he found a most abundant and remarkable hyperaemia of the brain and pia mater, of such an intensity, that the arteries at the base of the cerebrum seemed on the point of bursting with their contents. A fresh pachymeningitis was found in four cases, and a fresh lepto-meningitis in one. The other organs of the body all shewed signs of congestion or inflammation.

Goodall also had occasion to conduct autopsies on thirteen cases of influenza patients. ("Post-mortem Appearances of the Brain of Influenza Patients", Lancet, Feb. 20. 1892.) He found no congestion of the base in any of them. In two cases the internal membranes were congested; in another "perhaps congested". In two, the pia mater was almost bloodless. In the remainder, the lepto-meninges were to all intent and purpose normal, and hyperaemia was not very pronounced in any part of the body.

Maillart (before referred to) examined the brain in nine out of a dozen fatal cases occurring in the Cantonal Hospital of Geneva in the year 1891, and found definite lesions in each, implicating either the membranes, the blood vessels, or the substance of the brain; and, more significant still, none of the patients were, or had ever been, inmates of an asylum, but were such as usually seek relief at a public hospital.

MacDonald, writing in the Lancet of the 12th of March 1892, stated that he recently had the opportunity of examining the brain of an asylum patient (Dorset County), who had died from influenza. He found the pia mater to be thickened and excessively congested; there was an excess of sub-arachnoid fluid, and a more or less general cortical hyperaemia. But, the most remarkable pathological appearance was the intense congestion, almost amounting to capillary haemorrhage, of the medulla.

A T Y P I C A L F O R M S O F I N F L U E N Z A .

Influenza at times assumes so many forms, that one is frequently at a loss under what category to include certain cases, such being in consequence termed "atypical", "polytypical", "aberrant", or "many-typed". Of these the following are the most common varieties:-

The Rudimentary Forms;- Cases of this class are far from being uncommon, and are admirably described Zülzer (Ziemssen's Cyclopaedia of the Practice of Medicine, 1875) who states that "a considerable part of the population in fact, under the influence of the 'genius epidemicus', exhibits a state of indisposition which does not amount to a full febrile affection, but which is shewn to be a general invasion of the system by slight coryza, by confusion of the head, by one's quickly becoming fatigued, by disinclination for business, and often by sore throat, tickling cough. &c. "

The Complicated Forms.- The same authority draws attention to the fact that the features of the disease acquire still greater diversity from the various complications. This is especially true as regards the nervous symptoms, which may shew important modifications according as they affect more or less irritable individuals: in hysterical and such other patients influenza often assumes a pronounced nervous or spasmodic character.

In the case of haemorrhoidal affections, and in the rheumatic or gouty diathesis especially, the muscular pains will occur. With young children symptoms of congestion of the brain are often seen, and this perhaps may be the explanation of the unfavorable result sometimes observed in their cases.

"Chronic Influenza". This was the name given by Finkler (Twentieth Century Practice, vol. xv, pp, 11, 51., s.v. "Influenza") to the chronic bronchitis, or chronic pneumonia, caused by some of the bacilli remaining in the system, as they undoubtedly do in, certain cases, for weeks or more, as evidenced by examination of the sputum. The cough and expectoration, never entirely absent, may return, with their accompaniments of coryza, sore-throat, pyrexia, &c. at intervals, the same being attributed by the patient to "changes in the weather".

C O M P L I C A T I O N S A N D S S E Q U E L A E O F
I N F L U E N Z A .

The complications and sequels of influenza are both numerous and various, the malady having a marked tendency to graft itself upon other maladies, finding out as it were the weak spots of the patient's constitution. Males are more often affected in this way, and especially between the ages of thirty and forty.

1. POST-GRIPPAL PSYCHOSES.

D e l i r i u m . . .

(a)., During the attack, We have already seen that this distressing disorder may occur during the grippal attack, and continue for a greater or less period after the crises; and again, severe seizures are often ushered in by it. Although not in itself dangerous, it is usually indicative of the severity of the disease, and is always of grave portent in the neurotic and alcoholic. Van Deventer reports three cases of the latter in whom the delirium was a most conspicuous feature, and Miropolsky a case of the former type of individual in whom it had a fatal termination. (Van Deventer, *Über Influenza verbunden mit Geisteskrankheiten*, Centralb. f. Nervenheilkunde, Mai, 1890; Miropolsky, *La Grippe à Paris et dans les hôpitaux en 1899-90*. Paris, 1890).

(b). After the Crisis, Delirium, and mental derangements, have been seen, to a varying degree, after the fever has left the patient. Several cases of such are recorded by Kraupelin (*Archiv für Psychiatrie*, vol, xi., p. 137. 295 & 649; vol. xii, p. 287; Berlin, 1881-2.), occurring in his practice during the epidemic of 1889-90; and further instances are given in the writings of Savage (*The Neuroses of Infl.* Lancet. Nov. 7, 1891; Brit. Med. Jour., Nov. 7. 1891) Pick (*Neurol*, Centralb., 1890-4). Becker (*ibid*, 1890-6) Pons (*Journal de Méd, de Nordeaux*, 22 Févr. 1890). as well as many others.

C L A S S I F I C A T I O N .

The various forms of post-grippal psychoses commonly met with can be with advantage, divided into four main groups;-

- | | | |
|-----------------|---|---|
| First Division, | | Neurasthenia, hypochondriasis, and melancholia. |
| Second | " | Acute asthenic delirium, delirium of collapse or inanition. |
| Third | " | Mental affections grafted upon pre-existing neuroses. |
| Fourth | " | General paralysis of the insane. |

First Division.

Cases of Neurasthenia, Hypochondriasis, and Melancholia. (Mental Depression).

These patients exhibit all phases of mental depression from simple neurasthenia, to extreme hypochondriasis, melancholia, and depressive insanity. The patient is utterly unfit for any kind of exertion, and falls into a depraved melancholy condition. He is subject to delusions, such as having committed murder and the like, has forebodings of evil, and may exhibit a suicidal tendency. Althaus (Infl. pp. 88-90) describes two cases of this peculiar condition, the first being neurasthenia with hypochondriasis, the other melancholia. Many other instances are to be met with in the writings of Thomas D. Savill (Clinical Lectures on Neurasthenia, 2nd Edition, 1902); Leledy (La Grippe et l'alienation mentale. Paris 1891); Snell (Infl., Allg. Zeitschrift f. Psychiatrie, Berlin, 1890, p. 418); Ladame (Annales medico-psychol., Paris, 1890, p. 20); and Mairet (Montpellier médical, Mai et Juin, 1890.). Mairet's case is very characteristic, and was that of a middle-aged woman whose family history was in every way satisfactory. The influenza seized hold of her in January 1890, but was a very mild form indeed. On the seventh day, however, her mind gave way, and the aberration assumed the form of low delirium and melancholy. She imagined that her family were ruined, and reduced to

penuary. This state of appairs continued for ten days, when she has an apoplectic seizure, and lapsed into unconsciousness. Her melancholy gradually became worse, and she imagined that she had been the cause of all the deaths in the parish which had resulted from the influenza. She accused her husband of soaking matches in her drink, she saw spiders floating in the air; she imagined herself surrounded by water, and endeavoured to drown herself in it. She ultimately had to be confined in an asylum.

The cases described by other writers present features pretty much in common with this.

Ladame's cases was a middle-aged neurotic woman, who suffered from the influenza at the close of 1889, Melancholy set in after a few days, and was of a most distressing kind, which, with various morbid delusions, lasted for two months. He also quotes a cases of Martin's, a coffee-house keeper, aged 45, a man of temperate and regular habits, in whom the melancholy developed upon the third day, resulting in suicide after a fortnight of extreme desponsency.

Snell's patient was a young woman, aged 18, in whom the malancholy developed with the defervercence of the grippal attack. She anticipated her admission to the asylum by hanging herself.

Second Division.

Acute Asthenic Delirium, Delirium of Collapse or Delirium of Inanition.

(Mental Excitement).

To instance the peculiarity of the class of influenza patients which come under this category we may quote in extenso a case which came under the care of Julius Althaus (Influenza, pp. 90-92., 2nd. Ed.). The patient was an accountant's clerk, aged 26, single, who presented himself for treatment in May, 1891. He was in every respect a very temperate and steady youth, of excellent personal and family history. The influenza attacked him, in a somewhat mild form, in April 1891. After a week in bed he,

contrary to the advice of his medical attendant and employer, insisted upon resuming his occupation, which he now followed in a most unsatisfactory, careless, and slovenly manner. His own bedroom was now kept in a state of great confusion. His strange conduct in the streets attracted the attention of the police. During this time, he had no appetite, and suffered from insomnia. Gradually his memory gave way; he accused his fellow-clerks of robbing their employers; said there were too many cats and dogs about the place, and expressed a fear that he was going to be prosecuted for perjury. The following night he got out of bed, about 2 a.m. and ran to the office, where he created a disturbance by raising the alarm, thinking that there were thieves about the place. On examination, the following day, he was found to be in an excited condition, and behaved in a foolish manner, as if insane. His tongue was coated, his breath foul; pulse 140 and weak; the temperature subnormal, and he had a frequent tendency towards fainting. Under a few months of treatment, he ultimately recovered.

Several more excitable cases are described by writers, such as Mairret, Schmitz (*Allg. Zeitsch, für Psychiatrie, Berlin, 1890, p. 288.*); Lelady; and Bartels (*Einfluss der Influenza auf Geisteskr., Neurol, Centralb., 6. 1890*).

Mairret's patient was a middle-aged gentleman, who had always been in good health. The unsatisfactory point in his family history was that his mother had died at his age (50) of softening of the brain with dementia. He took the influenza in January 1890, and made a good recovery in twelve days. Five days afterwards, he returned from open-air exercise with a bad headache, which developed into delirium with hallucinations. He felt convinced that he had ruined both himself and family, and that murderers were concealed in his bedroom. The constant supervision of his attendants alone prevented him from jumping out of the window. He suffered from paresis of the bladder; never slept, and was always confused and thick in speech. He became gradually worse, and seemed upon the point of death. Nevertheless, after ten days of suffering, the vesical paresis, delirium and dementia left

him; and, in three weeks, he was quite well again.

Schmitz's case was that of a shoemaker, aged 24, of good family history, who, in January 1890, took a mild form of influenza. About the fifth day, he developed hallucinations, imagining that two men and a woman were waiting at the window to drown him. He slept none, kept jumping in and out of bed, bolted the doors, and listened intently for the approach of his supposed enemies. He developed a tendency to assume the defensive with knives and a pitchfork, which he flourished whilst running about the streets; this alarmed the whole locality, and necessitated his compulsory retirement to an asylum, where he recovered in a few weeks.

Leledy reports the case of a priest, aged 46, who was similarly afflicted, and who imagined himself to be a distinguished ecclesiastic, and become so maniacal and erotic as to require male restraint. He behaved in a blasphemous and violent manner in church; and on the way to the asylum, breaking the windows of the carriage, shouting, screaming, and foaming at the mouth; in short, behaving like a raving lunatic. This condition subsided in four days, and he was convalescent in a month.

All cases, however, do not recover so thoroughly as these. Mispeldaum (Über Psychosen nach Infl., Allg. Zeit, für Psych., 1890, p. 127.) had under his care a lad of 16. whose mother had, in her youth, been an inmate of an asylum. He was confined to bed, in December 1889, for two days with an attack of influenza; but went to work at the end of the week, where he continued in his capacity of mason's apprentice for five days, when he developed symptoms of delirium and hallucinations. He could not swallow, passed his excreta where he lay, imagined another lad was in bed with him, and that he had perjured himself. He could not recognise his friends, had visual hallucinations, vertigo, and fits of vomiting. The condition wore off in about four months, but he remained permanently demented.

Bartels has endeavoured to prove that the delirium of inanition may be brought about by an attack of influenza in those who have been previously insane, and describes a case in point, viz, that of an aged lunatic, the subject of delusions, who, after the influenza, had hallucinations, anxiety, and confusion during which he died from pachymeningitis.

Third Division.

Mental Affections Grafted upon pre-existing Neuroses.

It is a well-known fact that influenza can accidentally excite a mental aberration. A case coming under this head would, therefore, be one in which a previously insane, pre-disposed, or very neurotic person, with the onset of influenza becomes, as it were, by accident mentally afflicted. Thus, the disease may cause a delirium tremens in an alcoholic person, or a mania in a former lunatic, and in all of these cases homicidal or suicidal tendencies are apt to be a marked, and almost characteristic feature.

The literature of the condition is very plentiful, but it will be sufficient for our purpose to quote a few typical instances:-

Snell (Infl. Allg. Zeitschrift f. Psychiatrie Berlin, 1890, p. 418.) describes how a factory girl, aged 17. during her treatment for melancholia in the Hildesheim Asylum, took the influenza, followed in the course of a month by great weakness and vomiting, ending in violent mania.

Leledy (ref. ante) mentions the cases of a woman, aged 35, whose father was a drunkard - later a lunatic - and her mother a victim to heart disease. Her mental condition at the time could hardly be called normal, and her religious views were peculiar. Having experienced a business disappointment, she became even more morose, when in January 1900, she was seized with an attack of influenza. Soon after her recovery, she became excitable, violently deluded, and took to wandering about the country. On admission to the asylum, she behaved in a peculiarly offensive manner, quarrelling and fighting with the

attendants, in addition to biting, tearing the bedclothes, and refusing to sleep. This state became worse and worse, requiring her detention in the padded room.

Kraepelin (ref. ante.) once had occasion to treat a farmer's son, aged twenty, of bad family history. His brother was a stammerer, and two of his cousins lunatics. He had been afflicted for many years with spasmodic torticollis, and was very peculiar in his ideas. He recovered from his grippal attack in a week, returned to work, suffered a relapse, complicated with delusions and restlessness.

Althaus (Influenza, p. 93.) describes the case of a broker, aged 33, married, the subject of hypochondriasis for twelve months prior to 1889. In December 1889, he had a severe attack of influenza. His condition in February 1890 was that of irresistible homicidal impulses, such being towards his wife and children. He used to rush out of the room at meal times, because the sight of the knives on the table made him feel as if he were compelled to cut the throats of his wife and children. He was quite incapacitated from attending to his business, and suffered from vertigo, insomnia, tenderness in the head and over the upper part of the spine. His pulse at this time was 112, and his temperature 98.8 degrees F. His bowels were constipated, and the urine loaded with phosphates. He became practically well again in six weeks.

Fourth Division.

General Paralysis of the Insane.

Instances of this condition, as caused by the grippal attack, are by no means rare, some degenerative lesion of the cerebral cortex being induced by the toxine.

Althaus (Infl. pp. 94 - 96.) mentions two such typical cases, one of which died and the other recovered.

The first was a merchant, aged 52, married, and the father of three, and of good family history. He contracted the influenza in January 1890, and made a satisfactory recovery; but it again laid him low in the following April, with disastrous effects. His entire condition seemed

changed. Nothing seemed to interest him, and he had the utmost difficulty in both walking and standing, as well as in using his hands. He seemed to be quite absent-minded and silly at times. He had a left hemiplegia in August, and he died comatose a few days after.

The second case cited by Althaus, and which happily recovered, was a merchant, aged 51, married, and the father of three children, of good family history, and of temperate habits. The influenza attacked him in the April of 1891, and he was for months afterwards the sufferer of an incipient general paralysis of the insane. He shewed signs of both mental and bodily failure, followed by ~~both~~ epileptiform seizures and insomnia. There was marked exaggeration of both knee jerks.

MODE OF ORIGIN AND DEVELOPMENT OF POST-GRIPPAL
PSYCHOSES. -

Consideration of the clinical features of the various nervous disorders following attacks of influenza, naturally us to enquire into the various factors producing them: such as the pyrexia, the toxine, and the patient's idiosyncrasy.

(a), The Influence of the Fever. -

The rise of temperature found in influenza cannot do otherwise than disturb the general nutrition and metabolism of the patient's system, including that of the entire nervous mechanism, on which it acts as an irritant, by causing increased oxidation of the free albumen of the brain. Loewy (Virchow's Archiv. Berlin, 1891, vol. cxxvi, p. 218.) has proved that this destruction of albumen always occurs in fever, leading to a depression of the mental faculties. The heart being accelerated by the accession of the fever, the irritation is contributed to, causing the brain troubles as just described. With the fall of the cardiac rate, a passive congestion is believed to occur in the meningeal and cerebral veins, leading to anaemia of the cerebral substance, which is now imperfectly nourished, and may fall into a state of oedema.

(b), Influence of the Grippotoxine. -

The fact of the early onset of the delirium in many of the cases of influenza which we have described, would point to the likelihood of the poisonous toxine, with its special affinity for the medulla, circulating in the blood and irritating the brain. This is believed by Savill (Clinical Lectures on Neurasthenia, 1902, p. 62.), and other neurologists, to be the principal agent in the causation of the influenza neuroses; which, as we have already noted, are to be met with when the temperature is not high - perhaps 101 or 102 degrees F. - shewing that the degree of the fever present bears no relation to the mental derangements.

(c), The Idiosyncrasy of the Patient. -

Many observers hold that a neurotic predisposition exists amongst everyone of the patients afflicted with these psychoses. The strongest upholders of this theory are: - Kraepelin (ref. ante.), Ladame (Annales Medico-psychol., Paris, 1890, p. 20.), and Savage (Lancet, Nov. 7, 1891.). These writers opinions on the question are by no means, however, universally accepted. Althaus (Infl., p. 147.) warmly combats them as he found no predisposition in any of the cases which he examined, and only in about some 37.2% of those reported by others. One cannot deny the fact that alcoholism, and other debilitating factors, may render the patient's system more amenable to the development of the grippal psychoses; but they cannot be considered as in themselves etiological: for, one frequently meets with, in everyday practice, intensely neurotic persons who have had as many as three or four attacks of the influenza, and who, nevertheless, have not been afflicted with any kind of nervous derangement in consequence. Althaus believes that in cases where psychoses follow the feverish attack, a toxine of a specially deleterious influence upon the grey matter of the cortex may have been formed in the system. In view of our present knowledge of the disease, his opinion is, in all probability, the correct one.

Has the Grippotoxine a more specifically noxious influence upon the cerebral nutrition than any other morbid poison?

Kraepelin and Ladame (referred to) think not; others, again, hold that the toxine is especially noxious in its

effects upon the nervous economy; for, reasoning by analogy, we find that the psychoses are seldom to be met with in such general diseases as measles, whereas they are so common in influenza which attacks only about one-half of the community. It is likewise remarkable that a much greater variety of the nervous disorders follow influenza than any other febrile disease.

(d), Influence of Sex and Age. -

It appears certain that post-grippal psychoses are most likely to attack the individual between the ages of 21 and 50. Althaus (referred to) found this to be so in about 68% of his 97 cases. The following statistics are taken from the 123rd. page of his work.

0 cases of psychoses were found between 1 and 10 years.

16	"	"	"	"	"	11	"	20	"
22	"	"	"	"	"	21	"	30	"
22	"	"	"	"	"	31	"	40	"
22	"	"	"	"	"	41	"	50	"
8	"	"	"	"	"	51	"	60	"
6	"	"	"	"	"	61	"	70	"
1	"	"	"	"	"	71	"	80	"

The same observer also found that the male sex was much more predisposed to these maladies than the female. Out of 166 cases, 96 were of the former, and 70 of the latter.

Can Influenza Cure Insanity?

This must, of course, remain an open question, but it is, nevertheless, one of great importance: authorities are much divided in opinion concerning it.

Metz (Heilung einer Paranoia nach Influenza, Neur. Centr., 1890, 7.) reports a remarkable case of a labourer, aged 33, who was confined in the asylum for attempting to shoot himself, wife and landlord, whilst suffering from mania and delusions. An attack of influenza in January 1889, resulted in his recovering both health and reason.

Helweg (ref. ante.) furnishes the description of two cases proving that influenza may have some salutary effect upon the insane condition. One of them was a woman, aged 28, who became insane after an attack of puerperal fever, and was quite cured by her grippal seizure. The other cases were equally fortunate in recovering - the insanity

being due to the same malady.

Psychologists admit that a shock to the nervous system may cure insanity. Thomson relates how such a happy result followed a fall from a second storey window, in the Lancet of December 19th., 1891. The probable explanation is that such cases are attended by cerebral anaemia, which the congestion of the influenza neutralizes, leading to restoration of the vascular equilibrium.

In spite of this, however, we often meet with instances of insanity being made much worse by an attack of influenza. For example, Bartels (Neurol. Centralb., 6, 1890.) mentions the case of a man, aged 30, the subject of paronia, who was on the fair way to recovery, when he was attacked by the influenza on January 4th., the same being complicated by much mental disturbance, resulting in death on the 23rd. of March, from chronic meningitis, with granulations on the ependyma of the ventricles.

11. POST-GRIPPAL DISEASES OF THE BRAIN AND ITS MEMBRANES. 1, Hyperaemia. -

The necropsies made on many cases of influenza have proved that hyperaemia is by no means of rare occurrence. The researches of Helweg and Maillant have already been given.

Kohts (Therap. Monat., Dec., 1896.) describes the autopsy on a girl, aged 3, in whom he found hyperaemia of the dura mater, cortex and central ganglia.

Piggott (Lancet, Aug. 1, 1893.) reports the occurrence of influenza in a child, aged one year and ten months, the symptoms all pointing to severe cerebral hyperaemia. The temperature of the infant (a male) was 105 degrees F., and the pulse 140. The conjunctivae were injected, and the reflex of the same abolished; the breathing was stertorous, and the patient unconscious. He, nevertheless, made an excellent recovery.

Hall of Rothway (Glasg. Med. Jour., Oct., 1890.) mentions how both his brother and sister were attacked

with the influenza at the same time; the latter recovered, but the former died with symptoms indicative of sudden and intense cerebral hyperaemia.

2, Haemorrhage. -

This is very commonly met with in influenza, and it is sometimes of a very severe and extensive nature.

Senator (Berl. Mrd. Gest., Nov. 25, 1891.) had a case which had a severe attack of the grip, and in whom there was a right hemiplegia with profuse epistaxis. The autopsy revealed haemorrhages in the ^{left} ~~right~~ cortex, with numerous abscesses round the clots.

Maillart (Etude Clinique sur la grippe pandémique, Genève, 1891.) describes the post mortem examination of a man aged 47, who had died from influenza with cerebral symptoms, and in whom he found profuse haemorrhage of the brain on both sides, and in the middle fossa. It had taken place under the arachnoid, and extended into the upper portion of the spinal cord, the actual cause of the haemorrhage being rupture of an aneurysm on the basillar artery.

Fürbinger (Deutsche Medicinische Wochenschrift, Jan. 21, 1892.), at the autopsy of a servant girl, who had died from influenza with cerebral symptoms, found haemorrhages in the omentum, small intestines, longitudinal sinus, and adjoining veins: as well as thrombosis of the veins of the pia mater superiorly, together with general infarctions of the convolutions of both hemispheres.

3, Inflammation. -

Considering the great affinity which the congestion of influenza has for the head, one naturally expects meningitis to be a common complication; and of this condition the literature teems with instances.

Maillart (ref. ante) again reports three cases. One of them was a man, aged 40, who had died on the seventh day, with delirium and hallucinations. At the autopsy, the pia mater was found to be severely congested, and covered with a thick layer of opaque serum. Another patient was a woman aged 60, who had paid little attention to her illness, and endeavoured to "work it off", during which procedure she was attacked by pneumonia. On the ninth day, she began to vomit, presenting a temperature of 104 degrees F., as well as a small and very irregular pulse. She rapidly became

comatose, perspired profusely, had one pupil (the left) larger than the other, and died after enduring this condition for eighteen hours. At the necropsy, the pia mater, at the base and convexity of the cerebrum, was found to be oedematous, and covered with a layer of greenishropy pus (containing streptococci), which also filled the lateral ventricles; the brain itself, however, was found to be of natural consistence.

The third case of Maillart's was that of a hairdresser aged 40, who was suddenly taken with fever, accompanied with congestion of the conjunctivae and contracted pupils. He became violent and seemed to have visual hallucinations, and was incessantly muttering. He died on the seventh day; and his brain was subjected to examination. Both it and the dura mater were of the normal consistence and appearance: but the base and convexity of the pia mater shewed oedematous infiltration, and great distension.

Nicholson - in his article on the Complications and Sequelae of Influenza in the British Medical Journal of June 13th. 1891. - states that he has met with meningitis in the person of a woman, aged 42, who died on the seventh day of the grippal attack. The autopsy revealed the condition of meningitis suspected, the same being of a purulent character. Purulent lymph was found covering the tempero-sphenoidal lobe, and the parietal, on both sides, especially the base, and spreading on each side into the Sylvian fissure. Congestion and oedema of the pia mater generally, existed with serous effusion over both of the cerebral hemispheres.

Fürbinger - referred to - furnishes similar examples of this condition. In one of his cases, which recovered, the symptoms distinctly pointed to meningitis.

Hebblethwaite (Lancet, Dec. 12, 1891.) mentions a fatal case which was complicated with what looked like a tubercular meningitis; unfortunately, an autopsy was not allowed.

Baumler (ref. ante.) describes the case of a cooper, aged 19, who took the influenza towards the close of 1889. He suffered from headache and shivering fits, and his temperature was 104.4 degrees F. A swelling, tender on pressure, and the size of a half-crown, appeared on the right side of the forehead. He became delirious, had rigors and

irregular temperature, as well as vomiting, vertigo, paralysis and anaesthesia of the left side of the body. On opening the swelling, it discharged much pus having an offensive odour. Death occurred on the sixteenth day of the illness. At the autopsy pus was found to have formed under the dura mater, flattening the right hemisphere, and filling the right frontal sinus.

Reference to Bristowe's article upon Cerebral Suppuration in the British Medical Journal of July 4th., 1891, brings to our notice the case of a girl, aged 18, who died of pneumonia, with meningitis and mania, on the ninth day of the grippal attack.

Eichhorst (Über Infl., Blatt. f. Schweizer Ae. vol. xx., 1890.) had occasion to perform an autopsy on a woman, aged 60, who died under circumstances similar to the above, on the twenty-first day of the influenzal attack. On opening the head, he found purulent meningitis, and effusion into the ventricles.

Ewald (Deutsche Medicinische Wochenschrift, Jan. 23, 1890.) describes how, at the autopsy, he found basal meningitis, in the case of a young woman who had died during the convalescence of influenza.

Many other cases of influenza patients meeting their death from meningitis - at all ages, and in both sexes - are recorded by such writers as Sokolowski (Schmidt's Jahrb., 1890, p. 243.); Leyden (Weitere Mittheilungen über die in Berlin herrschende Infl. Epidemie, Deutsche Medicinische Wochenschrift, 1890, 49. †; Berliner Klinische Wochenschrift, 1890, 10.); and Kormann (Weiner Medicinische Blätter, 1889, 51, 52.).

4, Cerebral Abscess. -

A careful perusal of the literature of influenza brings to light the records of several cases of abscess of the brain, but it does not seem to be a common complication of influenza.

Weichselbaum (Weiner Klinische Wochenschrift, 1890, 7.) in nine cases found an accumulation of pus in the accessory cavities of the nose; in one of his patients, the pus, containing the capsulated cocci, had spread to the dura mater, causing meningitis with cerebral abscess in front,

working into the lateral ventricles.

The report on the influenza epidemic in the Prussian army, contains a notice of a case of abscess of the left frontal lobe.

Bristowe (Brit. Med. Jour., July 4, 1891) mentions two cases who suffered from symptoms indicative of a cerebral abscess, in one of whom it was actually discovered at the necropsy.

Aczel (Allg. Med. Cl. Zei., 1890, 28.) describes having found an abscess the size of a filbert nut, in the left prefrontal lobe, corresponding to the median portion of the central sulcus.

Truckenbrod (Berliner Klinische Wochenschrift, Nov. 16, 1891.) reports a case of cerebral abscess, in the left temporal lobe, from otitis media following influenza.

5, Embolism and Thrombosis.—

To this dangerous condition, complicating influenza, Leichtenstern (referred to at the beginning of this work) has given the name of "apoplectic influenza"; and he reports no less than seven cases, of whom three recovered, but two contracted hemiplegia and died.

Fürbringer (Deut. Med. Woch., Jan. 21, 1892.) has met with at least one instance.

Senator (Berl. Med. Woch. Ges., Nov. 25, 1891.) has placed on record two cases, both of them fatal; one in a woman, aged 27, the other in a man, aged 33.

Althaus states that he has seen several cases, three of which he describes in his work on influenza — pp. 143-7.

Embolism of a large cerebral artery may occur at the very commencement of the influenza attack, from the coalescence of a number of small thromboses circulating in the blood.

These cases present nothing peculiar in the way of symptoms, which are pretty much those described in the various text books.

111. DISEASES OF THE SPINAL CORD AND ITS MEMBRANES. -

1, Inflammation. -

The inflammatory process is very apt to attack the spinal cord or its membranes, and the literature of influenza is full of instances.

Laviran (Soc. Méd. des Hôpitaux, Feb. 21, 1890.) has seen this condition in an influenza case complicated with pneumonia. The patient had a complete paraplegia, and died of asphyxia - the paralysis rapidly invading the upper region of the body and the bulb.

Bidon (Rev. de Med., Paris, Aug. et Oct., 1890.) mentions an instance in which the condition, though severe, ended in recovery.

Foa (Sulle alterazione del midollo spinali nell'Infl., Il Policlinico, 1890, No. 5.) has seen cases of meningo-myelitis in the case of a middle-aged woman, who died from a severe attack of the grip, complicated also with pneumonia. The cord showed hyperaemic patches scattered throughout its substance.

Fereol (Soc. Méd. des Hôpitaux, Feb. 21, ~~1890~~ 1890.) found acute ascending myelitis in the spinal cord of an over-worked medical practitioner, who died from the respiratory form of influenza, and who suffered during his illness from paraplegia, extending ultimately to the bulb.

Streeten (Die Grippe-Epidemie in deutschen Heere, 1889-90; Bearbeitet von der Medicinal-Abtheilung des K. Preuss. Kriegsministeriums, Berlin, 1890.) mentions how Appleton, during the influenza epidemic of 1836-7, met with inflammation of the spinal marrow, in some cases which had been overlooked at the commencement.

Mackay describes, in the Lancet of August 1st. 1891, an interesting case which he treated for meningo-myelitis following influenza.

2, Sclerosis of the Spinal Cord. -

As in the case of syphilis, the various scleroses of the spinal cord may be either primary or secondary; i. e., they may appear as primary sequels, or at a later period, even after the other neurotic affections have appeared and vanished again.

Althaus (Infl., pp. 152-162.) has met with the follow-

ing varieties:-

- 1, Hemi-anaesthesia followed by Spastic Spinal Paralysis.
- 2, Progressive Locomotor Ataxia.
- 3, Cervical Tabes.
- 4, Postero-lateral Sclerosis.

All of the above presented characteristic symptoms and need not be described here.

Herzog (Berliner Klinische Wochenschrift, 1890.) describes a nerve lesion in a boy of eleven, who had a severe grippal attack in December 1889, and who thereafter developed symptoms of transverse myelitis.

Leichtenstern (Deutsche Medicinische Wochenschrift, May 29, 1890.) has seen a similar case, in which the "girdle-pain", exaggerated tendon reflexes, and violent pain in both legs, were consequent upon influenza.

Villard (Leçons cliniques sur la Grippe, Paris, 1890.) reports the case of a woman, aged 38, who had tabes, with so much loss of power that she was unable to walk without the aid of a support. With the invasion of the grippal attack, she suffered agonizing pain in the dorso-lumbar region, which resisted all kinds of sedatives for a week, after which she remained paralysed in the legs, and paretic in the arms.

Bidon (referred to) describes the case of a middle-aged woman who had suffered from myelitis for nearly a year. She was paralysed in the left leg, had retention of urine, weakness of the arms, "pins and needles" all over the body, "girdle-pain" and "lightning pains" in all the extremities, muscular wasting, and abolition of the tendon reflexes. The attack of influenza began with a violent headache, and had the effect of aggravating the previously existing ailments. So intense was the hyperaesthesia, from the increase of the myelitis, that she could not even be touched. After the crisis, the legs remained in a condition of total paralysis, with the arms utterly useless and the unfortunate patient bed-ridden. She became worse and worse, and the legs even more painful and useless. The arms were next attacked with so intense a pain that she could not even sleep; and, at the same time, she lost control over the bladder.

IV. DISEASES OF THE PERIPHERAL NERVES.

During influenzal attacks, changes in the nerves or their peripheral endings are by no means rare, especially hyperaemia and neuritis.

Sanson - writing in the Lancet of January 2nd., on "Some Painful Affections following Influenza" - accounts for all the sequels, primary or secondary, on the basis of their being caused by a peripheral neuritis affecting the sympathetic ganglia and nerves, the vagus, and the sensorimotor nerve trunks. This view, however, has not been generally been accepted by others who are inclined to believe, as we have already seen, that the post-grippal psychoses and diseases of the brain and spinal cord are purely central diseases.

(A), THE CRANIAL NERVES.

1, The Olfactory Nerve. -

Anosmia is a very common complication, or sequel, of influenza, and is frequently met with in the daily routine of practice, especially in the catarrhal form of the disease. Such has been variously accounted for: it is possibly due to an olfactory neuritis, from compression of the endings of the nerve in the Schneiderian membrane of the nose, by the accumulation of the purulent secretion, which is so apt to gather there as part of the catarrhal state. This opinion is upheld by both Senator and Leichtenstern.

2, The Optic Nerve and the Motor Nerves of the Eye. -

This subject will receive attention later on.

3, The Fifth Nerve. -

Of all the painful affections following influenza, the most common are those of the fifth nerve.

Neuralgia is of very frequent occurrence, and most resistant to treatment. It is often to be found in connection with the supra-orbital branch, following its area of distribution: though not so common in the second and third divisions.

Holtz (Berl. Klinische Woch., 4, QIOP.) describes the case of a man, aged 35, who had been afflicted with syphilis

and who, after the grippal attack, was seized with excruciating headache, which utterly disabled him, resisted all remedies, and almost sent him insane. This soon turned into a neuralgic affection of the first and second branches of the fifth nerve - the entire condition yielding to large doses of potassium iodide.

Amann (Münchener Med. Woch., 1890, 9 & 10.) states that he has met with supra-orbital neuralgia in some 40% of his patients: it being due to an acute neuritis affecting the nerve primarily, or extending to it from the inflamed osseous canal in which it may happen to lie.

Sanson had occasion to treat a man, aged 38, for supra-orbital neuralgia, the neuritis being suspected to be due to a former attack of syphilis which the influenza now revived.

Althaus (Infl., p. 168.) instances the case of a clerk who suffered from post-grippal neuralgia for three months.

Anaesthesia, in connection with the lingual nerve, has been seen by Frey (Deutsche Med. Woch., Mar. 19, 1891.). There was numbness, loss of sensation in the tongue, and abolition of taste.

4. The Facial Nerve (Portio Fura). -

That part of the seventh pair of nerves of Willis, controlling the muscles of facial expression, is very frequently the subject of neuralgia.

Paralysis of the facial nerve is also common. Julius Althaus had occasion to exhibit such a case before the members of the Clinical Society of London, on May 23rd. 1890. Referring to the 23rd. volume of the Transactions, we find that the patient was a clerk, aged 45, of excellent family and personal history, who had not even undergone exposure to cold. The influenza attack was accompanied by severe prostration. So altered were his features by the paralysis, that his friends could recognise him only with great difficulty. His facial expression was statuesque, and he had much difficulty in mastication from buccinator paralysis. He could not smoke, owing to labial paralysis,; he was unable to restrain his tears, sniff, or articulate.

Facial Palsy with Hyperacusis, or morbid acuteness

of the sense of hearing, is recorded by the same observer (Infl., p. 172). The patient, a tradesman, aged 29, appeared for treatment in October 1890, suffering from paralysis of the right facial nerve. His hearing on the right side was painfully acute, so that the least noise distressed him: and it appeared to him as if people who were talking in the ordinary way were actually shouting into his ear at the top of their voices.

Spasm of the Facial Nerve - the so-called "Tic Convulsif" - has been brought about by influenza.

Bidon (Revue de Med., Paris, Aug. & Oct. 1890.) instances the case of a woman, aged 52, who, during her convalescence, from the influenza, was seized with tonic spasm of the left facial nerve alternated, every two or three minutes, with clonic spasm.

5, The Auditory Nerve. - (8th. Cranial - Portio Mollis of 7th.).

(Wide section on diseases of the ear - later.).

6, The Pneumogastric Nerve. - (10th. Cranial).

This important nerve is in action both sensory and motor; it arises from the floor of the fourth ventricle, and is distributed to the ear, pharynx and larynx, the lings, oesophagus and stomach. It has a multitude of branches, for example, the auricular, pharyngeal, laryngeal (superior and inferior), recurrent laryngeal, cardiac, pulmonary, oesophageal, gastric, hepatic, communicating, and meningeal. One may, therefore, readily understand what great systemic disturbance may be brought about by grippal affections interfering with it.

(1), The Pharyngeal and Oesophageal Plexuses have, in a few instances, been subject to anaesthesia and paresis.

(a), Post-grippal paralysis of the soft palate has been described by Joachim (Lähmung des Gaumens, Schmidt's Jahrbücher, 1890, p. 245.) occurring in a woman, aged 36, in whom it could not have been due to diphtheria, as she had not at any time suffered from that disease. On the tenth day of the influenza attack, she developed nasal speech, and fluids regurgitated through the nose.

A somewhat similar case is described by Heymann in the Proceedings of the Laryngological Society of Berlin, February 7th. 1890. The patient was a child of twelve, in whom

the influenza produced a bilateral paralysis of the soft palate.

Jankau, in the same publication, reports the same disease co-existent with otitis and ozena.

(b), Laryngeal Paresis, though perhaps more common than the former, is not so often encountered in general practice.

Althaus (Infl., p. 175) says that he has seen aphonia, resembling the loss of voice so often noticed in connection with hysteria, with temporary paralysis of the adductors of the vocal cords, and that in a patient in whom there was no inflammation or factor likely to produce it.

Cazeaux, writing in the *Revue Générale de Clinique et de Thérapie* of 10th June, 1891, describes the case of a girl, aged 21, who was the subject of hysterical aphonia - but otherwise healthy. She became gripped in December 1899. During the febrile attack she suffered from dyspnoea with inspiratory stridor, lasting until July 1890. There was found to be nothing in the way of tracheal, bronchial, or pneumonic disease to account for this; but laryngoscopy disclosed paresis of the posterior orico-ary muscles preventing the glottis from opening properly during the inspiratory act.

(c). Spasm of the Glottis, has proved fatal in one of Revilliod's cases (*Rev. Méd. de la Suisse romande*, Mars, 1890. p. 145); the spasmodic laryngeal cough was a distressing symptom.

Strange (*Brit. Med. Jour.* Sep. 13. 1890) mentions a peculiar affection of the vagus nerve, due to influenza, occurring in the person of an elderly and healthy gentleman (medical) who, during the epidemic on Worcester in 1890, was seized with a peculiar weak, painless feeling, with a sense of oppression over the cardiac region, like that of impending death. His pulse at bedtime was only 29, and he felt cold all over. This condition wore off in six hours. The following night he was seized with a violent spasmodic hacking cough, lasting continuously for several hours, and occurring the next two or three nights. Then set in a violent gastric catarrh lasting for many days. We quote this case at length in order to shew how the toxine of influenza can irritate more than one branch of the vagus nerve at the

same time.

(d). Tachycardia, or abnormal paroxysmal rapidity of the cardiac action. in which the rate may reach even 200, is a comparatively rare affection. It is due either to paralysis of the inhibitory nerve of the heart, or to a stimulation of the cardiac acceleratory nerves.

Althaus (Infl., p. 177) has seen a case of this condition, the patient being a married healthy gentleman, aged 35, who at the Xmas of 1899 was for a week laid up with the Influenza. He complained of intense pain, chiefly over the cardiac region, had a hacking cough, and great difficulty in breathing. He remained indisposed up to July 1890, during which time his pulse was 160, and of so little tension that it could be stopped by finger pressure.

Sanson has reported several instances of pain in the cardiac neighbourhood; one of them resembled severe angina pectoria, the other a mild variety of the same. These cases, and others, all differed from true angina in having pulses of low tension.

(e). True Angina Pectoris. is one of the most common sequels of influenza, the majority of cases met with, at least in this locality, being attributed by the sufferers to the same.

Röhring (Neurologisches Centralblatt, 1890, 15) has met with it in a sergeant, previously healthy, aged 33.

Sanson has seen many cases of angina: in most of them the pain was paroxysmal, nocturnal, and accompanied by pyrosis or vomiting.

Peter (Bulletin Médicale, Feb. 2. 1890) reports the death of a merchant during a violent attack of angina, following influenza complicated with hypostatic pneumonia.

Carageorgiades writes, in the British Medical Journal of 21st June, 1891, of a case of uncomplicated angina pectoris, following influenza, which has many points in common with Röhring's instance.

7. The Spinal Accessory Nerve.

This important nerve (11th cranial) is concerned with motion alone, and arises from the floor of the fourth

ventricle to supply the sterno-cleido-mastoid and trapezius muscles. Its branches are mere filaments.

The grippo-toxine has been known to produce a paralysis of this nerve, and so induce "wry-neck" or torticollis. The recorded instances of this condition are not numerous. A case of Montague Miller's is described on the 181st page of Althaus's work on influenza. It was that of a lady, aged 50, who became gripped in the November of 1889. Towards the termination of her illness she became afflicted with a very acute spasmodic torticollis of the left side, which continued without intermissions night and day. Her memory likewise began to fail, and her tendon reflexes were exaggerated.

8. The Hypoglossal Nerve (12th cranial).

This nerve is also concerned with motion, and arises in the floor of the fourth ventricle; is distributed to the hyp-glossus and the hyoid muscles. It has several branches. *w. g.*, descendens noni or hypo-glossi, thyrohyoid, genio.hyoid, and meningeal.

Here again the recorded instances of paralytic conditions of this nerve are but few. Flatten (Duet. Med. Woch., 1890,8) mentions a case which he had of its complete paralysis on the right, in a woman, aged 54.

9. Polyneuritis of the Cranial Nerves.

The cranial nerves arise in some part of the cerebro-spinal centre, and issue from the skull through the foramina at the base. They are twelve in number, and are named according to the order in which they pass through the dura mater, as follows from before backwards:

1st.	Olfactory.	7th.	Facial (Portio dura).
2nd.	Optic.	8th.	Auditory (Portio mollis).
3rd.	Motor oculi.	9th.	Glosso-pharyngeal.
4th	Pathetic.	10th.	Pneumogastria (Per vagum).
5th	Trifacial (Trigeminus)	11th.	Spinal accessory.
6th.	Abducent.	12th.	Hypoglossal.

Polyneuritis of these chiefly affects the motor nerves of the eye.

An interesting case is published by Althaus (Infl. p. 182), of an affection of this class, in connection with

the third, fourth ($\frac{1}{2}$) fifth, and sixth nerves, complicated with herpes in the face and eye. The patient, a lady aged 56. took the influenza in January 1890. The intense headache developed into delirium on the second day, when a crop of serous desicles appeared upon the left brow, temple, eyelid, and left side of the nose - the eye simultaneously being inflamed and closed up. After a week or so the pain subsided, the vesicles dried up, and the eye could be re-opened, but was useless for vision for months afterwards. In July 1891 it was in the right eye $\frac{1}{10}$ in the left $\frac{1}{10}$. Ptosis, nyctagmus, paresis of the rectus internus, and old *iritis* were discernible. The patient suffered from intense neuralgia of the brow, temple, eyelid, and left side of the nose. A condition of somnolence was induced by pains, sensations of trickling of water, biting of insects, formication, pricking by pins, and the like. In addition she suffered from anaesthesia of the region of distribution of the supra-orbital nerve. but there was no loss of mental or physical power.

Another case is described by Schirmer (*Zehender's Klinische Monatsblätter für Augen-Heilkunde*, 1890., p. 312). The patient, a middle-aged woman was attacked with severe headache, fever, & bronchitis. The following day, right ophthalmoplegia set in. The fifth nerve became affected, as evidenced by anaesthesia of the right frontal region, the conjunctive and cornea, the eyelid, cheek, nose and lips, and by paralysis of the masticatory muscles. In addition she had paresis of the facial and hypoglossal nerves.

Cases, having many points in common with these, are reported by Uthoff (*Deut. Med. Woch*, 1890. 10); Guttman (*Berliner Klinische Woch.*, Dec. 1, 1890). and Phlûger (*Berliner Klin. Woch.*, 1890, 28); the symptoms of which were those of acute superior and inferior polio-encephalitis - so described, but in reality acute nuclear ophthalmoplegia. They attributed the paralysis of the third, fourth, and sixth nerves to acute inflammation of the grey matter on the floor of the fourth ventricle, and the third as well. A careful study, however, of the cases, and the literature upon the subject. must lead one to the inevitable conclusion

that the seat of the mischief is located, not centrally but at the base of the brain in the middle cranial fossa, and the nature of the malady to be a polyneuritis rather than a polio-encephalitis.

DISEASES OF THE SPINAL NERVES.

The spinal nerves consist of 31 pairs taking origin by an anterior or motor root, and a posterior or sensory root, from the spinal cord, proceeding to their respective destinations through the intervertebral foramina on either side. They are arranged into groups, corresponding to the region of the spine through which they pass; viz.,

Cervical	8 pairs.
Dorsal	12 "
Lumbar.	5 "
Sacral	5 "
Coccygeal	1 pair.

Intercostal Neuralgia is by far the most common affection of the spinal nerves, and the literature of influenza teems with instances.

Polyneuritis of other Spinal Nerves is also as frequent in influenza as in other infectious fevers.

It may be in a severe form, and associated with anaesthesia or paralysis, or with paraesthesia or paresis.

Remak (Berliner Klin. Woch., Feb. 24. 1890) describes the case of a gentleman, aged 50, who developed paralysis of both legs and arms a week after the grippal attack. The reaction of degeneration was noticeable in the region supplied by the musculo-spiral nerves, with the sole exception of the supinator longus muscle. Paralysis, with its usual clinical features, affected the crural nerves, the ulnar and median nerves, the case being one of multiple degenerative neuritis, or amyotrophic degenerative polyneuritis.

Henoch (Berliner Klinische Wochenschrift, Feb. 24. 1890) reports a case of peripheral paralysis, from simple neuritis, in a girl of eleven, several weeks after the grippal attack.

The Polyneuritis may assume a milder form, and

instead of afflicting the patient so severely as the above, may stop short at a paraesthesia or paresis,

Althaus (Infl., p. 187) reports an instructive case occurring in a woman, aged 39. who took the influenza in March 1890. After a week in bed she complained of powerlessness, and a variety of sensations, such as tingling, pricking, creeping, fluttering, pinching, tearing, throbbing, and the like. Attempts at standing were frustrated by the speedy onset of tremors: consequently she could not walk without aid. There was also numbness and loss of power in the upper extremities; writing and delicate manipulations were impossible; she complained of neuralgias, and had frequent attacks of giddiness. She remained unrefreshed by sleep, and her memory was a blank, and her ideas confused. All the superficial and deep reflexes - excepting the knee-jerk- were either diminished or lost. There was great tenderness on pressure over the great nerve trunks, and sensibility was impaired generally, especially in the forearm, hands, legs, and feet. These parts showed wasting, and responded slowly to electricity, which agency ultimately effected a cure.

Pain in, or about, the spine - Rachialgia - has at times resulted from an attack of influenza. Althaus mentions (Infl., p.189) such a case in a woman, aged 37, who for some three months subsequent to her illness, had suffered from darting pain in the back, arms, and hands. The whole of the vertebrae, especially the four upper, cervical, were extremely tender on pressure, which same caused shooting pains into the arms to the finger tips.

Sansom (Symes Thompson's Annals of Infl., 2nd. Ed. p. 397) describes several cases; one that of a lady, aged 25, who for four months after her influenza illness, had suffered from darting pain, causing her to scream, in both arms, especially at night. Another patient was a gentleman, aged 41. the pain in his case being in the left lumbar region, right shoulder and left wrist, course of the sciatic nerve, and in the thigh muscles. Agonising nocturnal exacerbations were also a feature of this case. A third patient was a woman, aged 33, in whom the pain,

aggravated by the taking of meals, was felt in the muscles of the calves of the leg and of the thigh. A fourth instance occurred in a woman, aged 23, who suffered from acute pain in the thigh and leg, worse at night, and following the course of the right sciatic nerve. The illness was also complicated by syncopal attacks and shooting pains in the epigastrium.

Sansom's fifth patient was also in a female, aged 48, in whom the pain was located in the right hip and right arm, extending from the right shoulder to the fingers, and aggravated by any kind of movement.

Embolism has been known to either precede or complicate the neuritis. Such an occurrence is reported by Eichhorst (Corresp. Blatt. f. Schweizer Aerzte, vol. xx. 1890), the patient being a young man, aged 22, who after the subsidence of the fever was seized with a severe pain in the left foot, with livid discolouration, and complete anaesthesia, which disappeared under massage and fomentations. This, however, was followed by paralysis of the right brachial plexus in about a week. But the nerves showed no reaction of degeneration.

Post-grippal Multiple Neuritis has also been described by Westphalen (Petersb. Med. Woch., 1890, 48) in the person of a circus manager, aged 29. in whom there could be traced no history of alcoholism or syphilis. On the seventh day of a mild influenza he complained of sensory disturbances in the fingers and toes, following which, in another week, were weakness in the arms and legs, paresis of the right facial nerve, vertigo, and dysphagia. The tendon reflexes of the biceps and triceps muscles were lost, but there were neither angle-clonus, anaesthesia, bladder or rectal trouble.

Draper published in the New York Medical Record of 1890, 9, a case of peripheral neuritis of the left musculospiral and median nerves, in whom the muscles supplied by them underwent paralysis and atrophy.

Honèn (Finska Läkarsälls Kapets, vol. xxxii, 12) has seen a case very similar to that of Draper, and occurring under similar conditions.

Havage (Rev. de Med., Feb. 1891, p. 138) had occasion to treat a case of polyneuritis in the person of a publican. Although immediately following his grippal attack, one must take into consideration the possibility of its being due to alcohol.

Two cases of Multiple Degenerative Neuritis, which recovered, have been reported by Church (Jour. Amer. Assoc. Nov. 1. 1890). Both patients had been previously healthy and the disorders seized them a week after the subsidence of the fever. In them were noted pain, anaesthesia, paresis, abolition of the knee-jerk and planter reflex, muscular atrophy, and the reaction of degeneration.

The Breast, Coccyx, Hip-joint, &c., have frequently been found to be attacked by severe post-grippal neuralgias. Herpes Zoster has also been placed on record by Brakenridge (Edin. Med. Jour. May 1890).

V. DISEASES OF THE SYMPATHETIC NERVES.

In order to thoroughly understand the various symptoms produced by post-grippal disorders of the sympathetic nerves, it is very necessary to bear in mind their anatomical relations.

This system of nerves consists of four essential component parts, viz;—

- (a). Ganglia extending from the base of the skull, down each side of the spine as far as the coccyx.
- (b). Three great gangliated plexuses situated respectively in the thorax, abdomen, and pelvis, in front of the spine.
- (c). Smaller ganglia situated in relation to the abdominal viscera.
- (d). Numerous nerve fibres, or branches of distribution.

The diseases which attacks of influenza may induce in this important nervous mechanism are as numerous as varied, and commonly met with in the literature and reports of societies.

1. Paralysis by Compression, has been described by Holz (Berliner Klinische Wochenschrift, 4, 1890). The patient was a man, aged 31, who had been subject to hyperidrosis

on the right side of the head for five hours. Having neglected himself during his second attack of influenza, he was suddenly seized with dysphagia and choking, from acute thyroiditis. The right side of the gland enlarged to the size of a small apple. The proptosis present made the case appear like one of Graves's disease. On the third day appeared ptosis of the right eyelid; the right pupil was "pin-hole", but responded to light and accommodation. The former hyperidrosis on the right side of the head was now converted into a condition of anidrosis, whilst a vicarious hyperidrosis developed upon the left side. The pulse now became accelerated, and the blood vessels of the fundus of the eye narrowed. The symptoms were, therefore, exactly similar to those produced by section of the cervical sympathetic nerve, and produced either by compression of the enlarged gland, or the adjacent inflammation of the second and third cervical ganglia. With decrease in the swelling the symptoms abated.

2, Hemicrania, Disturbances of an headache-like character such as megrim, are exceedingly common sequels of influenza, If persistent, the condition is apt to be aggravated, and may last for months, especially in neurotic females, resisting remedies, and shattering the sufferers health.

Again, congestive headaches are by no means rare. The pain is apt to be "dagger-like"; it shews a decided preference for the temporal region, and is sometimes of an acuteness almost past enduring, necessitating shaving of the head. The patient may also have photophobia, and the pain is nearly always made much worse by partaking of food or stimulants. In view of its congestive character one is not surprised that it should give way to the iodide of potassium after resisting all other remedies.

3. Scintillating Scotoma. In this peculiar condition there is a fixed spot or space in the field of vision, corresponding to some abnormality in the retina or optic centres of the brain; when the serrated margins extend peripherally, and produce a large defect in the visual field, the scotoma is then said to be scintillating.

Althaus (Infl., p.199) has reported a case of it in a previously-healthy girl, aged 17. With the subsidence of the influenza attack she complained of excruciating pain at the back of the eyes, and of peculiar visual sensations likened to "Silver and gold floating in the air", together with headache, and attacks of temporary loss of sight lasting for some twenty minutes at a time. She also presented hysterical manifestations.

4. Exophthalmic Goitre., has been occasionally met with in connection with influenza.

Colley (Deut. Med. Woch., Aug. 29, 1890) mentions the case of a woman who developed by-lateral bronchocle within a month after her influenza attack.

Graefe's symptom - failure of the eyeball to follow the upper lid in glancing downwards - was absent, but there was deficient convergence.

Villard (Leçons sur la Grippe, Paris, 1890) has seen a somewhat similar instance; the Graves's disease having existed in his patient, a man aged 36, for eight years. The main symptoms were the unsightly thyroid enlargement and tachycardia. On taking the influenza, the pulse rose to 160, the lower limbs became paretic, and the upper ones tremulous. The former, next day, were in a state of paralysis, and the palpitation and thyroid enlargement became much worse. The tremors then became generalised, and exophthalmos was noticeable.

5. Diseases of the Abdominal Sympathetic Plexuses.

Sansom (Lancet, Jan. 2, 1892) states that he has seen several cases of visceral neuralgia, such as gastralgia and heptalgia, which he attributed to influenza affecting the sympathetic fibres and nerves.

Ferguson (The Alienist and Neurologist, Oct. 1890) reports visceral neuritis, occurring during the convalescence from influenza. The pain was located in the abdomen, absolutely resisted treatment, and killed the patient by its intensity in ten days. At the recropsy, the abdominal nerves and ganglia were found to be in a state of acute inflammation.

6. The Vesical Plexus. This arises from the fore part

of the pelvic plexus, and accompanies the vesical arteries, to supply the vesiculae seminales &c.

Knowing what we do concerning the virulence of the grippo-toxine, there can be no reason to doubt that bladder troubles may be met with in certain cases, although the literature contains but few references to such, Althaus, (Infl., p. 202) however mentions a case which he had, a woman aged 32, who for six weeks after her recovery from the influen^{za} suffered from such irritability of the bladder that the urine had to be avoided every half hour.

V1. GENERAL NEUROSES.

1. Epilepsy.

This distressing malady is not so infrequently met with after influenza especially in the neurotic. The grippo-toxine seems to have the power of not only inducing it, but can also revive a former epileptic tendency. The condition induced may be either an epilepsia mitior, or an epilepsia gravior. Althaus (Infl., p. 204) describes a case of each variety, which present nothing extraordinary in symptoms. The patients were both intensely neurotic, but had been free from serious affliction prior to this.

Headley Neale (Brit. Med. Jour., Feb. 27, 1892) describes a case in which epilepsia gravior was a sequel of influenza. The patient was an excitable neurotic woman, aged 25. but of satisfactory family history. The influenza seized her in the spring of 1890, leaving ptosis behind it; the following year she had a second grippal attack. On the fifth day she had an epileptic fit, but recovered from it and the pre-existing ptosis in a few days.

Jacksonian Epilepsy is said to have been encountered by Erlenmeyer (Berliner Klinische Woch., 1890, 13). This form of epilepsy consists of spasmodic contractions in certain groups of muscles, due to local disease of the cortex; is always confined to one-half of the body, and is attended with retention of consciousness. His case was that of a young medical practitioner, aged 25, with

petechiae on the face, neck, breast, tongue, &c. He had the usual symptoms, as above, which our authority explains on the assumption that the influenza caused a localised disease of the cortex, like to a small haemorrhage in the cortical centre for the left arm similar to the petechiae on the body.

We have already noted that the grippo-toxine may revive an old epilepsy. Such an unfortunate circumstance occurred in one of Althaus's patients, a man, aged 32. (Infl., p. 200) who had been free from his 18-year-old epilepsy from October 1887, to February 1890, when he took the influenza again in November of the same year, and a third time in May 1891. The petit mal occurred twice after the second attack, and the more serious form after the third.

Van Deventer furnishes an account of an old epilepsy being revived by an attack of influenza; and a similar occurrence is recorded by Kaepelin.

Epileptic Automatism. The performance of acts without apparent volition has been described by Savage (Lancet. Nov. 7. 1891). The patient was a coastguardsman, who has a severe head injury twelve years ago. Returning to work after the influenza, he was observed to perform his duties quite automatically, and without remembering what he had done. With the object of combatting an ardent desire to kill one of his children, he wandered away from home, and ultimately gave himself up to the police on the supposed crime.

2. Infantile Convulsions. Apart from the fact of these introducing many ailments in children the influenza attack may begin in this way also, and with other symptoms resembling meningitis. Sevestre (De la Grippe chez les Enfants, Mercredi Médical, 1890, 13) has described many such cases. Kinnicut (Clinical Notes on the Complications and Sequelae of Infl., New York Med. Record, Feb. 22. 1890) also publishes an interesting account of a kind of convulsive epidemic occurring in the same family, three of whom took the influenza simultaneously. The oldest patient had eclampsia, the remainder general convulsions.

In Koht's patient (Therapeutische Monatshefte, Dec. 1890), an infant, aged three, there were unilateral convulsions, which the necropsy proved to be due to hyperaemia of the dura, pia, and cerebral substance, especially the central ganglia. During the course of the grippal attack she also has a left hemiplegia, paralysis of the sixth nerve and portio dura, nystagmus and aphasia.

3. Tetanus Churchouse (Brit. Med. Jour. Mar. 29. 1900) has met with a case of idiopathic tetanus following an attack of Russian Influenza, in the person of a strong healthy girl of sixteen. Having suffered a week from the influenza, she one day found herself unable to effect the act of deglutition. The next day she fell, and was unable to rise, owing to stiffness of the back, and this, together with the dysphagia, became worse the following day. The usual symptoms of tetanus now appeared, her pulse was rapid and weak, the temperature 100° , and the bowels constipated. A few days after this she had spasm of the glottis, and she died on the ninth day.

Moretti (Gaz. degli Ospitali, Dec. 2. 1891) has published a case of tetanic convulsions, similar to the foregoing, in a woman, aged 45. There was in this case also no history of scratch or abrasion. The patient made a good recovery.

Further instances of the same condition have been reported by Monoguido (ibid., No. 77); and Alison (Archives Générales de Medicine, April & May 1890).

4. Hystero-Epilepsy. Althaus (Infl., p. 212) dilates at some length on a case of this affection, which occurred in a young woman, aged 20, at the fourth day following the grippal attack. Although interesting, the case presented nothing extraordinary in the way of symptoms.

5. Hysteria. This functional malady constitutes a very common complication or sequel of the grippal attack, and instances of it, in both sexes, are plentiful in the literature. The following are a few of the Authorities and references:-

Railton.—"Case of Hysteria in a Child Six Years of Age, following Influenza", *Lancet*, Oct. 10, 1891.

Mouisset and Huchard.—"Complications of Influenza", *Lyon Médical*, 1890.

Segals.—"Clinical Study of Influenza", *Société Méd. des Hôpit.*, Mar. 21, 1890.

Bidon.—"Clinical Study of the Action Exerted by Influenza on the Nervous System, 1889-90", *Rev. de Méd.*, Paris, Aug. & Oct., 1890.

Duhomme.—"La Grippe", *Soc. Thérap.*, Feb. 1890.

Le Joubioux.—"Hysteria following Influenza", *Thèse de Paris*, 1890.

Guibert, - *Ibid.*

6, Astasia-Abasia.-

This peculiar and rare disease - a form of hysteria - is one of motor incoördination for standing or walking without any morbid symptoms in the legs to account for it.

Helfer (*Schmidt's Jahrb.*, vol. cxxvii, p. 27, 1890.), and Mobius (*ibid.*), have each reported a case of this condition. The sensibility and muscular power of the legs were in both instances quite normal; so also the tendon reflexes, and the patients could coördinate whilst sitting or lying, and move about by hopping or creeping.

7, Catalepsy.- This peculiar neurosis is characterised by loss of will, and muscular rigidity; and is due to a diseased condition of the central nervous system. It occurs chiefly in those of the neurctic temperament, and usually between the ages of 20 and 30. It is commonly associated with hysteria, but sometimes also with various psychoses. The literature of influenza contains numerous instances of its occurrence, from which we select, as typical, the following case of Inglott's (*Brit. Med. Jour.*, April 12, 1890.): - The patient was a woman, aged 32, in poor circumstances, and the mother of three healthy children. On the fourth day of the febrile attack, on getting out of bed, she was seized with a sudden loss of consciousness, in which state she remained for two hours with her eyes wide open. Her pulse was weak, and her face pale. On raising the arms or legs, or body, the new position was maintained.

8, Trance. -

This term is usually intended to refer to a kind of catalepsy, without muscular rigidity, and is characterised by a prolongation of abnormal sleep, in which the vital functions are reduced to a minimum, and from which the patient cannot, ordinarily, be aroused. The breathing is almost imperceptible, and sensation is abolished. The onset and awakening are both very sudden.

Cases are recorded by Raw (Lancet, Aug. 16, 1890.), and Barrett (Brit. Med. Jour., May 10, 1890.), in which absence of rigidity excluded catalepsy; and impossibility of rousing, hysteria.

9, Chorea. -

This functional nervous disorder has at times resulted from an attack of influenza: in some cases even occurring during the febrile attack, or before the convalescence is fairly established.

Althaus (Infl., p. 224.) describes two cases of the malady. One of them was of great intensity, and occurred in a child of 15, and was complicated by aortic disease and enlargement of the left ventricle. The other patient was a child of nine, who had suffered from scarlet fever two years before. The attack of influenza was a very severe one and the chorea appeared on the sixth day.

Villard (Leçons clinique sur la Grippe, Paris, 1890.) mentions the occurrence of chorea on the ninth day of influenza, in a child of nine.

10, Agoraphobia. -

This condition - which is a sense of morbid fear of open spaces, or dread of assemblies, dislike of crowds, or of association with others - has been met with somewhat frequently after the grippal attack.

Althaus (Infl., p. 227.) describes a case of such, occurring in a merchant of neurotic temperament, who had become involved in financial difficulties, and took the influenza in April 1891. During the convalescence he was able to walk as usual about the house, but as soon as he attempted to go into the open air, he was seized with a terrible sense of anxiety; his head and whole body felt as

hot as fire, and he swayed about like a drunken man, unless supported by the arms. He was otherwise healthy, and a change of air led to his complete recovery.

VII. DISEASES OF THE EYES.

Visual defects are perhaps amongst the most common of derangements of special sense due to the action of the influenza toxine. Authorities differ somewhat as to there being any particular ocular affection characteristically a complication or sequel of the disease. In the large number of instances, the eyes, prior to the grippal attack, have been quite healthy, and their being implicated, with such extraordinary frequency during epidemics, is probably due to the irritation of the fifth pair nuclei in the bulb, on the integrity of which the health and nutrition of the various ocular structures depends. This opinion is advocated by Guttman (Berliner Klinische Woch., Dec. 1, 1890), and Galezowski (Rec. d'ophthal., 1890, 2.).

T. S. Dowse (Brain and Nervous Exhaustion, p. 113.) holds that post-grippal visual defects may be of either peripheral or central origin: e.g., paresis of the nerve cells of the ciliary ganglion on the course of the nerve fibres of the iris: or to the ciliary muscle or dilator fibres of the iris: or, again, an ischaemia of the retinal vessels; a neurop-retinitis; changes in the optic tract or optic nerve; or alterations in the cuneus or its immediate neighbourhood. Changes in the optic field are almost always connected with paretic or paralytic conditions, or defects of speech. This may be due to grippal inflammation of the pia mater and arachnoid, resulting in adhesions leading to atrophy or softening of the convolutions.

Observers, such as Wicherkiewicz (Internationale Klinische Rundschau, 1890, 2 & 4.), stand practically alone in advocating the opinion that influenza is no more liable than any other disease to be followed by ocular disorders, and that none of them are characteristic of a grippal origin.

A mere cursory glance at the voluminous literature of post-grippal eye affections, should satisfy the most sceptical as to their being of very great frequency.

The names of the various authorities, and their cases, will be enumerated at the end of this composition.

1, Conjunctivitis is, perhaps, by far the most common ocular complication of influenza, so much so that some oculists have expressed their ability to diagnose the disease from the condition of the eyes alone. Others, such as Gradenigo (*Allgemeine Medicinische Centr.*, vol. Lix, 1890.), consider the conjunctivae to be the actual point of entrance to the system of the bacillus of Pfeiffer. Bezley Thorne (*Lancet*, Dec. 12, 1891.) is so strongly convinced of this, that he advocates the possibility of being able to abort the grippal attack at the outset by an immediate recourse to strong collyrium. On the other hand, however, Wicherkiewicz strongly refutes the idea of the bacillus gaining its entrance to the body through such a delicate membrane and sensitive structure as the conjunctivae; but, at the same time, he admits that the early onset of the conjunctivitis (on the first day), its exceeding great intensity and accompanying neuralgic pains, photophobia, lachrymation, &c., must be considered as significant.

Eversbuch (*Münchener Med. Woch.*, 1890, 6 & 7.) is of the opinion that the grippal conjunctivitis is quite different to the ordinary form in its more sudden onset and subsidence.

Landolt (*Manifestations oculaires dans le cours de l'épidémie actuelle, Semaine Méd.*, Paris, 1890, Mar. 5.) describes a case in which it was present chiefly during the convalescence, not at the outset of the fever: this being at least one objection to the opinion of those who believe that influenza can be diagnosed with certainty from the state of the eyes at the commencement of the illness.

2, Elepharitis, or inflammation of the eyelids is also common, and has been known to lead to oedema and abscess. Landolt drew attention to its great prevalence during the Parisian epidemic of 1889-90. In one of his patients a soft pinkish oedema appeared suddenly during the night, occluding the whole orbit; it was, however, uncomplicated by erysipelas and did not last long.

Madame Pokitoff (*Contribution a l'étude des complications oculaire de l'influenza*, Paris, 1890.) records the occurrence of an abscess on the eyelid of a young man, which grew to be as large as a pigeon's egg.

3, Inflammation of the Lachrymal Sac (Dachryocystitis)

when met with has always been unilateral and benign, even though accompanied with inflammation of the cellular tissues of the orbit, the periosteum, and the capsule of Tenon.

Fusch (Tenonitis nach Influenza, *Weiner Klin. Woch.*, 1890, 11.) has treated four cases of this condition; and Schapringer (*New York Medical Record*, June 14, 1890.) one ~~to~~ every similar to these .

4, Keratitis, though sometimes occurring during the febrile stage, is more often met with in the convalescence. It assumes two forms: keratitis punctata superficialis, and keratitis dextritica exulcerans - the "herpes corneae cachecticus" of Eversbuch. In the latter variety, pain, photophobia and lachrymation are absent - whilst present in the former - the cornea is anaesthetic from the first, and leaves large opacities behind it.

Galezowski holds that grippal keratitis always commences in one way, and that by lachrymation, and the most intense photophobia, neuralgic pain, and blepharispasm. From the constant occurrence of anaesthetic patches of ulceration, which he considers pathognomonic of influenza, he has given to the condition the name of "the triangular keratitis of grippe"

Bock (*Augen-und oherärztliche Erfahrungen während einer Infl. Epidemie*, B's Memorab., vol. xxxv., p. 257.) states that he has come in contact with many cases of corneal inflammation of a vesicular character, which he calls by the name of "keratitis vesiculosa" or "herpes corneae".

Several cases of serpiginous keratitis have been described by Delacroix (*Complic. oculaire de l'Infl.*, , Rheims, 1890.), and Rampoldi (*Annali di Ottalm.*, vol. xviii/517.

4, Iritis and Irido-chorioiditis. - A few cases of simple inflammation of the iris, and of the chorioid as well, have been published by Hosch (*Corresp. Bl. f. Schweizer Aerzte*, Mar. 1, 1890.), and others.

Pflüger (*Berl. Klin. Woch.*, 1890, 28.) has seen several cases of uveitis, and panophthalmia after influenza, of so great an intensity as to necessitate removal of the eye; also a severe case of bilateral irido-cyclitis, leading to

total blindness.

On as many as seven occasions, Rampoldi has met with glaucoma during the convalescence; so also Gradenigo, Eversbuch, and Radal.

5, Post-grippal Diseases of the Optic Nerve, are somewhat rare in occurrence. Some of the recorded cases are as follows:-

Acute Optic Neuritis.- Hillemann; *Über die Augenaffectionen der an Infl. Erkrankten*, Bonn, 1890.

Retinal Hyperaesthesia and Optic Atrophy; Pflüger (ref. ante).

Retro-bulbar Neuritis and Incipient Papillitis; Denti (" ").

Retro-bulbar Perineuritis; Reigmeister (*Weiner Kl. Woch.*, /90, 10.

Papillitis and Atrophy of the Papillae; Gazis, *Rec. d'Ophth.*, 1890, p. 402.

Optic Atrophy with Central Scotoma; B. Remak, *Deut. Med. Woch.* 1890, 2.

Blindness; Weeks, *New York Medical Journal*, Oct., 1891.

Dyschromalopsia; Stower, *Deut. Med. Woch.*, Aug. 28, 1890.

Primary Optic Atrophy; " "

Embolism of the Arteria Centralis Retinae; Hilleman.

Yellow Vision; Brieger, *Gesellschaft der Charité-Aeazte*, Jan. 23, 1890.

6, Diseases of the Motor Nerves and Ocular Muscles .-

These are by no means uncommon sequels of the grippal attack, and are due respectively to perineuritis and myositis. Such patients suffer very severe pain, except when the eye is at rest. The literature contains examples such as the following:-

Exophthalmos and External Ophthalmoplegia; Callan, *New York Medical Record*, June 12, 1890.

Paræsis of Accomodation; La Clinique, Brussels, Jan. 30, 1890.

External Ophthalmoplegia; Unthoff and Pflüger.

Bilateral Paralysis of the Fourth Nerve; do.

" " " " Sixth " ; "

(*Deut. Med. Woch.*, 1890, 10; and *Berlin. Klin. Woch.*, 1890, 28).

IX. DISEASES OF THE EAR.

Auditory defects are very common after an attack of influenza. Aurists have chiefly to endeavour to treat those which are visible, such as affections of the external and middle ear; whilst those due to an alteration of the brain come under the care of the neurologist, and are apt to be difficult of direct diagnosis..

Whilst existing disease of the ear is usually brought into prominence, or intensified, by the influenza attack, a severe affection has been known to have been directly started by it. With this assertion, however, Dalby (Lancet, Feb. 20, 1892) does not agree, but gives it as his opinion that a person with healthy ears has little to dread from influenza so far as the mucous surface is concerned, but it may become a serious trouble to one whose ears have formerly been the seat of inflammation. Nevertheless, the consensus of medical opinion is at variance with Dalby upon the point, and goes towards proving that, as a rule, in post-grippal disease of the middle ear at least, no history of an ear trouble pre-existent can usually be found. The various writers on the question will be noted at the end of the thesis.

Myringitis Haemorrhagica Bullosa. -

Haug (Münchener Med. Woch., 1890, 3); Schwabach (Berl. Klin. Woch., 1890, 3); Tschudi (Militär-Ärztl. Verein, Wein, Feb. 1, 1890); and Politzer (Wl. Med. Woch. Bl., 1890, 9) have directed attention to the frequency with which haemorrhagic inflammation of the membrana tympani occurs: even so early as the first or second day of the influenza attack. The patient complains of great pain, especially when the inflammatory process has invaded the tympanic cavity, and may become quite deaf; but, as a rule, does not suffer from vertigo. The inflammatory process may also set up a periostitis of the external meatus. The membrana tympani - which shews redness, lividity, blueness, and lenticular blebs on examination - undergoes spontaneous perforation in about ten hours, leaving a profuse and somewhat chronic otorrhoea.

Otitis Media. -

This may be either catarrhal or purulent, and begins

as late as the fourteenth day, commencing with pain and pyrexia. The patient is giddy and unable to hear. The pain is of such severity as to be unrelieved by the perforation of the drum, and is apt to develop into a chronic condition of neuralgia.

Mastoid Abscess. -

Is not at all rare, and pursues an ordinary course. Politzer and Gruber (Weiner Med. Blät., 1890, 8.), have each had a patient in whom the malady proved fatal, by causing meningitis or cerebral abscess.

Hugh Jones (Lancet, Mar. 19, 1892.) has reported a case in whom the abscess led to metastasis and capillary embolism, but the condition yielded on trephining the mastoid process.

Otitis Interna. -

This is not such a rare sequel of influenza as one might suppose.

Bowie (Lancet, July 11, 1891.) has published a case in which tinnitus became a troublesome and chronic symptom, even after the aural affection had healed, and the patient's health otherwise restored.

Dowse (Neurasthenia &c., 5th. edition, 1895, p. 116.) points out how difficult tinnitus is both to estimate and cure, being of a purely subjective nature, and associated with deafness and "noises in the head".

Lannois (Therap. Mon., 1890, 2.) has shewn that the disorder may end in permanent deafness.

Dalby describes cases in which previous ear disease has been rendered much worse by the grippal seizure.

Mènière's Disease. -

This, owing to the frequency of influenza outbreaks, is becoming a much more common disease than formerly. It is essentially a paroxysmal disorder. The patient feels as if he were "slipping off the earth", necessitating his making desperate clutches at any support which may be handy. He does not become actually unconscious, but feels very faint; his skin becomes pale, cold and moist; the pulse is small and weak; he feels intensely sick, and may vomit; but the constant and characteristic symptom is the vertigo. The

attacks, like those of epilepsy, may come on at irregular intervals, and gradually increase in frequency and intensity. The only cure for the distressing noises in the head is the occurrence of deafness, when there will be no more attacks.

Dowse also (Neurasthenia &c., p. 118.) draws attention to a serious form of post-grippal deafness, associated, as a rule, with a cerebro-spinal meningitis, vomiting, ⁺transitory paralysis. The condition is curable, so we are told, in no instance.

DISEASES OF THE ORGANS OF CIRCULATION.

Pericarditis and Endocarditis. -

These two conditions are not so commonly met with as might be supposed, during, or after, the influenzal attack.

During the epidemic which raged amongst the 55,264 men of the German army from 1889-90, only six cases of the former, and four of the latter, were reported: all of which recovered; as did also the four cases recorded by Gordon Black in the Lancet of 31st. January, 1892.

Fatal cases, however, have been reported by Leichtenstern, Tyson, Fürbringer, and Neidhart (Deutsche Med. Woch., May 29, 1890; Philadelphia Medical News, 1890, p. 113; Deutsche Med. Woch., 1890, 4; and Die Infl. Epidemie vom Winter 1889-90, im Grossherzogthum Hessen, Darmstadt, 1890.).

Pawinski (Berl. Kl. Woch., July 13 & 20, 1891.) has attended seven cases of influenzal endocarditis who had never before suffered from heart disease.

Thrombosis and Embolism. -

These diseases seem to be of a somewhat rare occurrence; but cases have been reported by several observers such as the following: -

Sydenham, Symmetrical Gangrene after Influenza, British Medical Journal, March 1, 1890.

Senator, Berliner Med. Gest., Nov. 25, 1891.

Cammerer, Gangrän, Sitzung des Hamburger Vereins, Jan., 1890.

Gerhardt, " des Unterschenkels, Berl. Kl. Woch. 1890, ~~89~~ 9.

Cross, Phlebitis after Influenza, Brit. Med. Jour., Apl. 26, 1890.

Johannsen, Gangrene of the Foot after Influenza, Pet. Med.

Woch., 1890, p. 413.

Duchesneau, Gangrene of the Limbs following Influenza,
Gaz. Méd., 1890, 24.

Highet, Symmetrical Gangrene following Influenza, Brit. Med.
Jour., July 18, 1891.

DISEASES OF THE RESPIRATORY ORGANS.

Rhinitis. -

Although a catarrhal condition of the nasal cavities is a usual accompaniment of the influenza, an actual inflammation has been known to occur. It is, however, very uncommon.

According to Landgraf (Berl. Klin. Woch., Oct. 26, 1891.), it has only been seen in about $\frac{1}{2}\%$ of the cases of influenza.

Pharyngitis. -

This has been reported by the same observer in eight instances, accompanied by angina lacunaris, and inflammation of Luschka's tonsil.

Laryngitis. -

An inflammatory condition of the laryngeal mucous membrane is, however, much more common during the grippal illness. Fraenkel indeed (Berl. Kl. Woch., Oct. 26, 1891.), has seen it occur as late as two months afterwards.

The laryngitis of influenza is very often complicated by a certain amount of aphonia, and the disease may even assume an haemorrhagic tendency.

The occurrence of a fibrinous infiltration upon the inflamed surface, may give the larynx a patchy-white appearance.

Lubinski (ibid) has occasion to treat some 63 cases of this condition, and was much struck with this singular white appearance, which he believes to be due to a necrosis of the epithelium.

Schaeffer had a case of such severity as to call for immediate tracheotomy; it was complicated with cervical abscess.

Medical literature abounds with other examples, of which the following are amongst the most accessible for reference:-

Herzog, Manifestations laryngologische Beobachtungen bei

Infl., Mitth. d. V. d. Ä. in Steyermark, Graz, 1890.

Koch, Manifestations laryngiennes et pharyngiennes d'Infl.,
Ann. Or. Mai, 1890.

Duflocq, Les Variétés cliniques de la Grippe, Rev. Med., /90, 2.
Le Noir, Ulcération des cordes vocales dans le cours de la
Grippe, Ann. Orielle, March, 1890.

Petrina, Beitrag zur Infl. Epid. in Prag, Pra. Me. Woch., 1890, 13.

Chauvel, État du Larynx dans la Grippe, Trib. Méd. Apl. 17, /90.

Wolfenden, Oedema of the Larynx a Sequel of Influenza., Brit.
Med. Jpur., Mar. 8, 1890.

Bronchitis, Broncho-pneumonia, and Pneumonia.-

The exceeding great frequency of the occurrence of these diseases has already been dilated upon elsewhere; references to further cases will be made at the end of the thesis.

Tachypnoea.-

Abnormal frequency of respiration has been often noticed during the various epidemics of influenza. It usually occurs in hysterical women, and is almost always intermittent. (Vide Gaipa and Titone in the Reforma Medica of December 10th. 1891; and the British Medical Journal of February 27th. 1892.).

Phthisis.-

Many consumptive patients attribute the commencement of their malady to a prior attack of influenza. Those with a tubercular taint are apt to contract the disease by prematurely exposing themselves to the cold during the influenza convalescence.

Authorities are far from being agreed as to influenza having any effect towards aggravating existing phthisis. The influenza attack did not have any effect whatever upon the phthisical patients of the following:-

Strümpell. (Über Infl., M. Me. Woch., 1890, p. 230.), and Heubner (Discussion über Infl., Schmidt's Jahrb., 1890, p. 230.).

On the other hand, however, influenza proved rapidly fatal to the consumptive patients of:-

Demuth (Über Infl., Vereinsb. Pf. Aezzte., 1890, 2.),

Sokolowsky (Schmidt's Jahrb., 1890, p. 243.),

Wiltschur (Über den Einfluss der Grippe auf den Verlauf der Phthise, Petersb. Me. Woch., 1890, 5.), Vogel (Münchener Med. Woch., 1890, 5.), and Maillart (Étude Clinique sur la Grippe pandémique, Genève, 1891.

Abscess of the Lungs, Gangrene of the Lungs and

Pneumothorax. -

A few cases of these diseases, presenting nothing uncommon in symptoms, are recorded by the following:-
 Kanler (Über schwere Lungen und Pleura Erkrank. bei Infl., Wiener Klin. Woch., 1890, 9.);
 Fürbringer (Deutsche Med. Woch., 1890, 4.);
 Kundrat (Abscess of the Lung in Influenza, Wi. Kl. Wo., 1890, 8.);
 Drasche (Über Infl., Wiener Med. Woch., 1890, 6, 17, 19, & 21.).

DISEASES OF THE DIGESTIVE ORGANS.

Dyspepsia, Gastric Catarrh, and Gastritis. -

The peculiarities of influenza as affecting the stomach have already been dwelt upon.

The Tongue is sometimes attacked by inflammation; the same is greatly aggravated by eating or talking. (Ramon Guiteras: Some Features of the Prevailing Epidemic of Influenza, New York Medical Record, 1890, p. 93.).

The Parotid Gland. - It is possible for influenza to induce such a severe inflammation of this structure as to actually cause death. ("Rusticola"; Parotitis as a Complication of Influenza, Britl Med. Jour., July 11, 1890.).

Enteritis. - This is discussed under the gastric form of influenza, and is a fairly common complication.

Intestinal Haemorrhage. - This complication is not very common. Fürbringer describes it as occurring in the case of a phthisical woman, with fatal result.

Acute Peritonitis, and Acute Hepatitis. - Three cases of the former, and four of the latter, are reported to have occurred during the German army epidemic.

Icterus. - of a catarrhal nature has been rarely observed.

Diabetes, of pancreatic origin, has been described by:-

Saundby (Brit. Med. Jour., May 10, 1891.), Fischel (Pra. Me. Wo., 1890, 9), and Villard (Lecons Clinique sur la Grippe, Paris, 1890.).

DISEASES OF THE URINARY ORGANS.

Nephritis.— This is a rather common sequel of the irritation of the toxine of influenza. A case of acute nephritis, due to a severe attack is reported by Piggott (Lancet, Aug, 29th 1890). The same condition, leading to necrosis of the kidneys, has been described by Leyden. (Über Infl., Wl. Me. Bl., 1890, 3; Be. Kl. Wo., 1890, 2, 3. Acute hæmorrhagic nephritis, occurring in a boy of eleven, has been noted by Mansel Sympson (Lancet, May 10, 1890); and another case by Frazer (Brit. Med. Jour, June 27, 1891)

Other instances of the occurrence of nephritis after influenza, and usually fatal, are published by the following — reference to whose writings has already been given;— Ribbert, Weichselbaum, Strümpell, Krehl, Anton, and Dracshe.

Cystitis.— This disease is usually supposed to be an extremely rare complication of influenza, but cases of it have been seen by:—

Widal. Art. Grippe, Traité de Méd., vol. i., 1890. p. 824).
Fränkel. (Discussion in Berl. Verein fu"r innere Méd., Dec. 7. 1891.

Frossat. (Genito-urinary Troubles caused by the Grip. Lyon Medical. 1890. 13).

Only one case of the disease was seen during the German army epidemic. (Die Grippe-Epidemie im deutschen Heere, 1890; Bearbeitet von der Medicinal-Abtheilung des K. preuss. Kriegsministeriums, Berlin, 1890⁷).

Paralysis and Atony of the Bladder.— These diseases are likewise rare, and are nearly always associated with other nerve troubles. Descriptions of cases can be seen in the writings of;—

Bilhaut, (Complications cérébro-spinales de la Grippe, Bull. Soc. Thé., 1890, p. 22).

Brakenridge. "The Present Epidemic of So-called Influenza, Edin. Med. Jour., May 1890).

Liégeois. (Parésie de la vessie dans l'Infl., Progrès, Méd., Mar. 26. 1892).

Althaus. (Infl. 2nd. Ed. 1892. p.p. 53 and 272).

DISEASES OF THE ORGANS OF GENERATION.

A. In the Male.

Epididymitis, constitutes a very rare complication or sequel. It was only once encountered during the German army epidemic.

Orchitis, is not so uncommon; it was a troublesome sequel in the cases reported by;-

Harris. (Case of Acute Orchitis following Influenza, Lancet, Jan. 2. 1892).

Briscoe. (Orchitis " " " " Jan, 23 1892)

(Kelly. (A case of Acute " " " " Feb. 13. ")).

B. In the Female.

Uterine Haemorrhages, occur chiefly during the stage of pyrexia, and under certain conditions are not so uncommon.

Haemorrhagic Endometritis, in a peculiar form and affecting several patients, has been described by Gottschalk (Einfluss der Infl., auf Erkrank., der Weisblichen Genitalien, Centr, f. Gynaek, 1890, 3).

The most remarkable case was one in whom the uterine adnexa had been previously removed. She suffered from profuse metrorrhagia for some five days. The uterus was swollen, flabby and soft, as in pregnancy and the cavity greatly elongated. Two of his pregnant patients aborted at the third and fourth month respectively.

Forty-five out of forty-eight of Müller's cases of non-pregnant women, suffered from bleeding from the uterus on contracting the influenza, especially about the menstrual time.- (Centr, fm Gynaek, 1890, 17).

It is a well-known fact that pregnant women are specially liable to have an abortion early in the course of the grippal seizure, Many instances of this unfortunate complication are on record. notably as follows;-

Amann. (Studien u"ber Infl., bei Schwangeren, Kreisenden und Wöchnerinnen, M.H. Me. Wo., 1890, 9, 10).

Banks, (Grip as a Cause of Abortion, Med, & Surg, Report, 1890, 17).

Wright. (A few cases of Epidemic Influenza presenting strange Features. New York Med. Rec., March 15. 1890).

Trossat. (Genito-urinary Troubles due to the Grip, Lyon Léd-, 1890. 13).

Lwow. (Über den Einfluss der Infl, auf den Verlauf der Schwangerschaft, Medrinsko Obos, 1890,2).

Influenza has been known to prove fatal to newly-delivered women; such an event is recorded by Purdon.

DISEASES OF THE SKIN.

Rashes, of various kinds, have been seen in connection with influenza. Hubert Bristowe describes, in his notes on an outbreak of influenza at King Edward's School for Girls (Brit, Med, Jour, Feb, 22, 1890), in 20% of the 175 cases, a distinct papular rash - sometimes serous, sometimes purulent - somewhat like that of scarlet fever, only larger. The papules were chiefly met with on the face and neck, but were sometimes noticeable on the shoulders, chest, arms, and hands. They were attended with much itching, and faded in two or three days.

A rash, like that of measles, has been noticed by Gordon Black (Lancet, Jan. 30. 1892), which was chiefly confined to the left side of the chest, and accompanied with intense neuralgia in that neighbourhood.

Guiteras (The Dermatoses of Influenza, New York Med. Rec. 1890,8) has described an erythema, resembling the scarlatina rash, which was accompanied by some of the manifestations of that disease, such as vomiting, sore-throat, quick pulse, and pyrexia. It was distinguished however, by affecting only the head, chest, and upper extremities, by not being punctuated, disappearing in twelve hours, and by being accompanied by a moist state of the skin. From the frequency with which he has seen it,

he calls it by the name of the "erythematous form of grip".

Herpes Febrilis, is by no means a rare condition, and is chiefly met with upon the face and lips. It occurred in 12% of Curschmann's cases (Schmidt's Jahrb., Vol. ccxxvi., p. 27. 1890); 25% of Demuth's (Uber Infl., Vereinsb. Pf, Aerzte, 1890, 2); and in 11% of patients seen by Stintzing and Weitenmeyer (Ein klinischer Beitrag zur Infl. Epidemie, Mh. Me. Wo. 1890.6). It has also been reported by such writers as ;- Bouchard (Sem. Med. 1890, No.5); Bilhaut (Bull. Soc. Therap., 1890, p. 22); and Schwimmer (Pesth. Med. Chir. Pr., April 1890).

Instances of nettle-rash, complicating the influenza are described by Minauf (Wi. Me. Pr., 1890, 12), and Hoffmann (Mon. Hefte f. Prac. Dermatologie, 1890, p. 199).

Erysipelas, may of course exist contemporaneously with the influenza, but is not due to the grippal attack, except indirectly - the toxine so reducing the vitality of the patient as to render him a good subject for the erysipelas. Four cases of the malady were reported during the German army epidemic of 1889-90; and another is described by Lemoine (Rev. de Méd., 1890. 6) following respiratory influenza and mumps.

Lupus Erythematodes, complicated one of Blaschko's cases, and led to complete baldness (Berl. Derm. Verin. Monatsschr. f. pract. Dermst).

Alopecia Areata, has likewise been reported by Mapother (Brit. Med. Jour., July 25. 1891), and Williamson. (Lancet. June 7. 1890).

DISEASES OF THE BLOOD.

The literature concerning the production of blood diseases by influenza is rather scanty, we may, therefore, presume that it has no special deleterious effect upon it.

Acute Pernicious Anaemia, has, however, been reported by Reiner, (Correspondenz blatt f. Schwei, Aerzte, 1890, 12)

the patient dying in three weeks. Pallor of the internal organs, effusions, and hæmorrhages, were found at the autopsy.

DISEASES OF THE BONES AND JOINTS.

Periostitis, has been recorded by several observers, notably Witxel (*Gelenk- und Knochen-Entzündungen bei acuten Infectiösen Krankheiten*, Bonn, 1890). and Pflüger in the right upper jaw. Möser (*Be. Kl. Wo.*, 1890, 10) reports two cases of the disease, in whom, on the third day, violent toothache set in, followed by swelling of the mucous membrane of the hard palate, and necrosis of the bone. Böse reports a case of purulent periostitis (*Be. Kl. Wo.*, 1890.15), with necrosis of the tibia, whilst Senator (*Berl. Med. Ges.*, Nov. 25. 1891) has seen a case of multiple synovitis.

HISTORY OF PAST EPIDEMICS OF INFLUENZA.

In dealing with the epidemiology of influenza, it will be only possible to give a very brief outline, and that by rejecting much irrelevant matter contained in the writings of the various historians, the majority of whom were inclined to attach the utmost importance to the condition of the weather, prevalence of other diseases, volcanoes, and the like, during the time that the various epidemics were raging. As we now understand contagion to be the essential factor in the spread of the disease, our task of describing the different outbreaks will be much less arduous than it otherwise might have been. This point, however, will be more fully explained when we come to discuss the origin and spread of influenza.

General Reference— For the history of the epidemics of 1510 to 1581, we are chiefly indebted to Dr. Thomas Short (*Chronological History of the Air, Weather, Seasons, Meteors, &c.*, London. 1749).

Much information, and an idea of the variety of

opinions expressed upon the various outbreaks, can be got from the writings of ;-

Symes Thompson. (Infl., or Epid. Catarrhal Fever, Annals of Infl., 1890).

Hirsch. (Handbuch der historisch-geographischen Pathologie, Stuttgart, /91).

Haeser. (Lehrbuch der Geschichte der Medicin, Jena, 1867, vol. iii, pp. 385. 944).

Kusnezow, and Hermann. (Infl., Eine Geschichtliche und Plinische Studie, Wien, 1890).

Brochin, (Article "Grippe" in Dechambre's Encyclopaedic Dictionary of Medical Sciences, Paris, 1884, vol. x. p. 712)

Most. (Influenza Europaea, Hamburg. 1820).

Gluge. (Die Influenza oder Grippe. Minden. 1837.).

Zuelzer. (Ziemseen's Handbook of Pathology and Therapeutics, vol. i.i. p. 491).

Kratz. (Materialien zu einer Geschichte der Infl., Leipzig, 1890).

Sir William Wilde. (Dublin Jour. of Med. Science., 2nd series, vol. v. p. 257. 1848).

EPIDEMICS OF 1510 - 1581.

A disease having symptoms like those of influenza was described in a 15th. century manuscript under the names of "Fuachd" (i.e., a cough or chilliness) and "Slaodan" (i.e., a cough or cold); and is mentioned in the Annals of the Four Masters as being epidemic in Ireland during the 14th century. A similar affection is alluded to in the early Gaelic manuscripts, under the name "Creathen" (i.e., a shaking or trembling).

Nevertheless, the first actual outbreak of influenza, of which we have undoubted evidence, occurred in the year

1510.

The outbreak is thus described by its historian Dr. Thomas Short, and his account coincides with influenza as we know it;—

"The disease called 'Coccoluche', or 'Coccolucio', because

the sick wore a cap or covering close all over their heads, came from the island Melite in Africa, into Sicily, so into Spain and Italy; from that over the Alps into Portugal, Hungary, and a great part of Germany, even to the Baltic Sea; every month shifting its situation with the wind, from East to West, so into France, Britain &c., Valeriola, &c. It attacked at once, and raged all over Europe, not missing a family and scarce a person. A grievous pain of the head, heaviness, difficulty of breathing, hoarseness, loss of strength, and appetite, restlessness, watchings, from a terrible tearing cough. Presently succeeded a chilliness, and so violent a cough, that many were in danger of suffocation. The first days it was without spitting; but about the seventh or eighth day much viscid phlegm was spit up. Others (though fewer) spit only water and froth. When they began to spit, cough and hoarseness of breath were easier. None died except some children. In some, it went off with a looseness; in others, by sweating. Bleeding and purging did hurt..... Where blood was let, the disease proved malignant and pestilential, being attended with a violent, cruel and unheard-of malignity, and made bad work."

The epidemic seemed to have no special form, being a combination of the nervous, gastric, and respiratory varieties. The main features, we learn, were severe neuralgic pains in the head, delirium, gastro-dynia, dyspnoea, spongia, debility, anorexia, insomnia, syncopal attacks, and a peculiar hacking cough. There was practically no mortality, and the deferescence was, in all cases, by diarrhoea or diaphoresis.

During the time of the outbreak, there were hail-storms in Lombardy; earthquakes; volcanic eruptions in Iceland; and contemporaneous sweating sickness in Spain. The epidemic was also preceded by a long continuance of moisture.

1557.

This epidemic occurred in Europe, its exact point of

origin being doubtful, and reached Britain in October, and lasted until the following January.

The outbreak assumed the form of an epidemic malignant catarrh, the peculiar symptoms being pain in the head, pyrexia, insomnia, sore-throat, dyspepia, dyspnoea, giddiness parotid swelling, bilious vomiting, and great prostration.

The epidemic was preceded by cold southerly winds, and long continued rainy weather. There were earthquakes in Kent, and meteors in November.

Peculiar disturbances were noticed amongst animals; there was murrain in Kent; flight of owls; premature migration of birds; desertion of pastures by cattle; and a plague of insects and mice.

Measles and smallpox followed in its wake, and there appeared dysentery in 1583, and the plague in 1584.

THE EPIDEMIC OF 1658.

For an account of this epidemic recourse has to be made to Dr. Willis's "Practice of Physic" (London, 1864, Part 1, on Fevers).

The outbreak took place, with great suddenness, towards the end of April, after a most severe winter of snow and storms, and winds. There were as many as 1,000 persons attacked every week in the towns.

The peculiar symptoms were bleedings from the nose, lungs, and rectum; headache and cerebral disturbance; pyrexia, sweatings, and nervous derangements.

THE EPIDEMIC OF 1675.

The historian of this outbreak is Dr. Thomas Sydenham, and is contained in the Sydenham Society's Edition of his works (vol. i. p. 226).

The disease appeared in October, after a hot summer, and mild autumn, and with the sudden appearance of cold moist weather, and pungent fogs; it was confined chiefly to London.

The peculiar symptoms were cough, pyrexia, pleurisy, and biliousness. Smallpox followed almost immediately, and the dysentery broke out in 1667.

THE EPIDEMIC OF 1688.

This outbreak of the influenza or "short fever" occurred in Dublin in May and July - London in May -, and was preceded there by glanders amongst the horses in the cavalry barracks, and those encamped on the Curragh of Kildare.

THE EPIDEMIC OF 1693.

This occurred towards the beginning of November, after a mild autumn, with a sudden and severe change to cold and frost. It assumed great intensity, and spared neither sex nor rank. From Dublin it extended to London and East Anglia, France, Holland, and Flanders.

The chief symptoms were fever, headache, and photophobia; and the disease terminated by critical diaphoresis.

THE EPIDEMIC OF 1710.

After being occasionally manifest in 1709, the disease became more epidemic-like in March, after one of the most intensely cold winters on record. The Thames became frozen over, and the mercury in the thermometer sinking into the bulb. The fever attacked everyone, but its area of prevalence was London.

The characteristic symptoms were a severe dry hacking cough, great thirst, quick pulse, intense headache, and pains all over the body. The plague broke out in the following year.

THE EPIDEMICS OF 1729 - 1743.

Our knowledge of these epidemics is mainly derived from three sources, viz; John Huxham (Observations on the Air and Epidemical Diseases, vol. 1., London. 1758);

John Arbuthnot (An Essay concerning the Effects of Air on Human Bodies, London, 1751, p. 193); and the Medical Essays and Observations, published by a Society in Edinburgh, 3rd. edition., Vol.ii. p. 26).

1 7 2 9.

The influenza reached Plymouth in February, having previously existed in Cornwall and the West of Devonshire. It reached London in November, and York in December, and was preceded by much rain, and high tides.

The principal symptoms were shivering, fever, headache, violent sneezing, pains in the back, chest and ears, cough, and sore throat.

1 7 3 2 - 1 7 3 3.

This epidemic raged all over England, during a damp and cold spring. It reached Edinburgh in November, Cornwall and Plymouth in the following February.

The main symptoms were bleedings from the nose, lungs, and bowels; biliousness; and swellings of the testes, parotis, and salivary glands.

The prevailing winds were northerly, and dry, There was much wet in the north; volcanic eruptions, and vivid aurora borealis. A comet also appeared, and there were fogs and explosions of meteors at the close of the epidemic.

The coincident epidemics were measles, cholera, diarrhoea nervous disorders, headaches, and delirium. Coughs were also noticeable amongst horses.

1 7 3 7 - 1 7 3 8.

This outbreak occurred in November, and raged in the locality of Plymouth.

The peculiar symptoms were intense nausea, vomiting, biliousness, inflammation and swelling of the salivary glands, rheumatic pains, toothache, and headaches.

Meteorological Conditions.— Vesuvius in eruption; earthquakes; a comet, and meteors.

Other Phenomena.— Diseases prevalent amongst horses, Lumbago attacks general.

Subsequent Diseases.— Apoplexy, nervous fevers, and palsy.

1 7 4 3.

This epidemic was described by Huxham, who was the first to use the name "influenza" in connection with the disease, in the following sentence — "This fever seemed to have been exactly the same with that which, in the spring, was rife all over Europe, termed the 'influenza'. Curiously enough, the term "la Grippe" was also adopted by the French in connection with this outbreak; for Biermer (Virchow's *Håndbuch der speciellen Pathologie und Thèrapie*) writes; "In France the 'influenza' has generally been called la grippe since the epidemic of 1743. This designation is probably derived from agripper (to attack), and not likely from the Polish word chrypka (raucedo), as T. Frank believes".

The epidemic raged chiefly in the neighbourhood of Plymouth, commencing in the month of April.

The most important symptoms were lassitude, shivering, headache, muscular pains, lumbago, anorexia, loss of taste, ophthalmia, epistaxis, critical diarrhoea, papules on the skin, apoplexy, dysentery. Worms were said to be common during the convalescence.

Meteorological Conditions.— Aurora borealis; an appearance as if soldiers were "fighting in the air"; variable weather; easterly winds for months prior to the outbreak; strong southerly winds during it: earthquakes; comet; and an evil-smelling fog. There had been an unusually heavy crop of fruit the previous year.

Animal Diseases.— Clough, glanders, and mange amongst horses.

THE EPIDEMIC OF 1758.

Historians.- (1), Professor Robert White of Edinburgh (Account of an Epidemic Disorder at Edinburgh &c. in Autumn 1758). (2). John Alves (Extract from Letter of Dr. Robert White, Feb. 12, 1759); (3). John Millar (An Account of the Epidemic; letter Dec. 8. 1758).

This outbreak commenced during the east winds of September; and spread over the whole of Scotland, in an irregular manner. Professor White, drew attention to the fact that early in September, before the influenza appeared, a disease existed among the horses in Perthshire - "the horses were observed to be more than usually affected with a cold and a cough". This is the first time that we hear of an apizootic coincident with an influenza outbreak.

The characteristic symptoms were a peculiar feeling of excoriation of the trachea, and profuse bleedings from the nose.

Meteorological Conditions.- Clear skies, unusual easterly winds; bostrichos typographicus singularly destructive. There were earthquakes in the following year; and there were epidemics of dysentery, and smallpox the preceding year.

THE EPIDEMIC OF 1762.

Historians.- (1), George Baker (The Epidemic of Catarrh and Dysentery of London in the Year 1762, Royal Society London 1764); (2.), W. Watson (Letter to John Huxham, London, December 9. 1762); (3). John Rutton (A Chronological History of the Weather and Seasons, and of the Prevailing Diseases in Dublin, London. 1770).

The epidemic commenced in September, after severe and variable weather.

The peculiar symptoms were headaches, severe coughs, pain behind the sternum, biliousness, and crisis by sweating.

Area of Prevalence.- Dublin.; Subsequent Epidemics.-

Bilious fevers, and dysentery; an eruption of Etna the following year;

Mortality. - Variable - rate high in some parts, low in others.

THE EPIDEMIC OF 1767.

Historian. - William Heberden (The Epidemical Cold in June and July 1767, Medical Transactions, vol. i. 3rd. edition, 1785, p. 437).

This epidemic commenced in London, to which locality it was chiefly confined, in the beginning of June, after very cold weather, and lasted until the end of July.

The prominent symptoms were shivering, persistent cough, headache, backache, gastralgia, insomnia, lassitude, and anorexia.

Meteorological Conditions. - Unusual cold.

THE EPIDEMIC OF 1775.

Historians. - (1). Fothergill (A Sketch of the Epidemic which appeared in London towards the End of the Year 1775, London, 1775, With his account is incorporated the correspondence which he had with a number of other physicians; and the whole published by the Royal College of Physicians of London - Medical Observations and Inquiries, &c., vol. vi., 1784, pp. 340 - 406). (2) Thomas Glass (ibid).

This epidemic prevailed during a wet autumn, from October to December, chiefly in London and Devonshire.

The most conspicuous symptoms were insomnia, sudden attacks of giddiness and headaches, nausea and intestinal disturbances, pain in the sides and loins, cramps, prurigo, erysipelas, and pustules.

The epidemic was followed by one of diarrhoea.

Coincident Phenomena - Sudden variations of temperature, thick fogs, earthquakes; and volcanic eruptions.

Disease amongst Animals. - Dr. Thomas Glass of Exeter described how, in his district in September, "many horses

and dogs were severely afflicted with colds and coughs". So also, Fothergill mentions the fact that "during this time horses and dogs were much affected - those especially that were well kept. The horses had severe coughs, were hot, forbode eating, and were long in recovering. Not many of them died that I heard of, but several dogs".

THE EPIDEMIC (CATARRHAL) OF 1782.

Historians.- Edward Grey (Medical Communications to the Society for Promoting Medical Knowledge, vol., i, London, 1784); James C. Smith (Remarks on the Influenza of the Year 1782, *ibid*, p. 71); Royal College of Physicians (An Account of Epidemic Disease called the Influenza, of the year 1782, Medical Transactions, vol. iii, p. 54;) R. Hamilton (Some Remarks on the Influenza &c.; Memoirs of the Medica Society of London, vol, ii, p. 418); Blagden (MS. Letter utilized by Symes Thompson in his annals, Ed., 1890, p. 177); John Haygarth (Of the Manner in which the Influenza of 1775 and 1782 Spread by Contagion in Chester and its Neighbourhood); Finkler (Twentieth Century Practise, vol. xv. pp. 11, 51. s.v. "Influenza", Deutsche Med. Wock. 1890).

This epidemic, perhaps the most widely spread on recordm commenced at sea between Malacca and Canton; spread west through Russia, Denmark, and Holland, appearing in Britain in April especially manifesting its virulence in the neighbourhood of Newcastle-on-Tyne.

The peculiar symptoms were pain in the chest and sides, diarrhoea (in some), langour, loss of smell and taste, contused feeling in the limbs, and soreness in the cheek bones.

Meteorological Conditions.- Weather in the winter very changeable, previous summer very dry and hot; autumn very wet, a late spring in 1782 attended by gloom, moisture and cold; dry fogs and peculiar storms; Hecla in eruption.

During this time insects were said to be very destructive.

THE EPIDEMIC OF 1803.

Historians.— Various Authors (Thompson's Annals, 1890, pp. 190 - 228); R. Pearson (Observations on the Epidemic Catarrhal Fever, or Influenza of 1803); A. Carrick (observations on the Influenza, as it appeared at Bristol in the year 1803); W. Falconer (An Account of the Epidemic Catarrhal Fever, commonly called the Influenza, as it appeared at Bath in the Winter and Spring of the year 1803); John Nelson Scott (Observations on the Influenza as it appeared in the Isle of Man, in the Spring 1803, "Annals of Medicine", vol. iii. p. 424).

This outbreak occurred during the months of January, February, March and April, originating at London, and spreading itself all over Britain.

The main symptoms were bilious headaches, epistaxis, low form of fever, which was sometimes engrafted upon scarlet fever.

Meteorology.— North-east winds; fetid acrid fogs; aurora borealis; sudden atmospheric changes; and earthquakes.

Coincidences.— Excessive mortality amongst insects, and disease of cattle and domestic animals.

Preceding Epidemic.— Diarrhoea.

THE EPIDEMIC OF 1831.

Historians.— John Burne (Dispensary Reports, London, Medical Gazette, 1831, vol. viii, p. 430); Admitalty Reports (1830 - 6); Medicinische Zeitung, pp. 242, 247; Gazette Médicale, 1833, p. 729; Chomel (ibid, 1831, p. 314); Olivier (ibid, No. 27, 8th May 1832); Veterinarian (1831, pp. 185, 217, 223); Groguier Recueil de Med. Veterinaire, vol. ix.).

This epidemic, having taken a year to spread from China, appeared in England about June, Its area of prevalence was London and Douglas.

Coincidences.— Dysentery concurrently and subsequently

a gradual transition to cholera; severe and peculiar maladies amongst animals.

THE EPIDEMIC OF 1833.

Historians.— Mr. Hingeston (London Med. Gazette, vol. xii. p. 199); Mr. Youatt (Veterinarian, p. 117, 1833); Rec. de Méd. Vétér. vol. x. p. 530; Entomol. Magazine, vol. i. ii. iv. v; Farmer's Magazine, vol. iv. p. 28. C. Darwin (An Account of the dust which fell in the Atlantic, Geological Transactions, 1845, p. 27.).

This outbreak occurred in London, in April, after damp weather succeeding cold.

The peculiar symptoms were severe catarrh, neuroses, bronchitis and cough with pituitous expectoration, pains over the body generally, sore throat, and pyrexia, much nervous disturbance, and slow convalescence.

Coincidence.— Much disease amongst horses.

THE EPIDEMIC CATARRH OF 1836 & 37.

Historians, Robert J. N. Streeton (Report upon the Epidemic Catarrh of the Winter of 1836-37. With observations upon the Meteorological Phenomena, by Wm Addison, Transactions of Provincial Medical Association, vol. v. i., London, 1838, p. 67.); Dr. Graves (London Med. Gazette, vol. xx., p. 786.); Dr. Glendinning (Notice of the Influenza of January and February 1837, Lond. Med. Gaz., Feb. 18. 1837, p. 781.); Dr. Bryson (Compilation from Statistical Reports of the Health of the Navy, 1837 - 43, and MS. communication.).

This epidemic commenced at Sydney in October 1836, and reached London in January 1837. From thence it spread to Birmingham, Liverpool, and Ireland.

The Peculiar Symptoms were cerebral disturbances, pain in the forehead, vertex, or occiput; pain behind the sternum; discharge of tears; peculiar acrid secretion from nostrils; looseness of the bowels, the diarrhoea being sometimes choleraic. Those most exposed to the weather had the most severe attacks.

Coincidences.- Diseases prevalent amongst cattle, nervous fevers,

THE EPIDEMIC OF 1847 - 48.

Historians.- Dr. Peacock (Introductory Notice of the Epidemic in London, Thompson's Annals, 1890, p. 349); Various Authors (idem pp. 379 - 395).

Duration of Epidemic.- October 1847 to January 1848.

Peculiar Symptoms.- A combination of the catarrhal and the gastro-intestinal forms: pneumonia; erysipelas; rheumatism, and a fatal form of capillary bronchitis.

Area of Prevalence.- Richmond, London, York, Edinburgh, and the north of Scotland.

Meteorology. Aurora borealis eight times, magnetic disturbances; fog and darkness.

THE EPIDEMIC OF 1889 - 90.

Historians.- To give an account of the numerous writers on this famous epidemic would fill a fair-sized volume; the variety of opinion and observations are chiefly derived from the writings of Dr. Hawkins. Sir. Peter Eade, Hon. Rollo Russell, Bezley Thorne, W. Burr, W.T. Gairdner, J. Greig Soutar, Sir, J. W. Moore, W. Tibbles, Gilbert-Smith, E.C. Barnes, H.C. Bristowe, Thresh, Sheridan, Delépine, and Lieut. Gen. Sir. F. Fitzwygram.

Duration. December 1889 to March 1890.

Area of Prevalence.- Originated in Bokhara in Central Asia, Siberia, Russia, Europe, America, India, and Australia. It became pandemic in Britain.

Peculiar Symptoms.- Absence of coryza; great prostration and a variety of psychoses; broncho-pneumonia very common, and frequently fatal; various rashes, followed by desquamation.

Coincidences.- Usually moist weather for some months previously, with fogs during active phase of epidemic: lessened prevalence in London after strong gales; "pink eye" amongst horses well marked and severe.

Fitzwygram, in his work on Horses and Stables, holds that this "pink eye" is merely a modification of the catarrhal form of influenza, the characteristic appearance being a remarkably clear pink colored condition of the conjunctivae accompanied by a swollen or cedematous state of that membrane. In this disease there is a decided tendency to the formation of fibrinous clots in the cavities of the heart, and in the large arteries, especially the pulmonary system - a condition which not infrequently leads to unexpected and even sudden death.

Dr. Parsons, in his report to the Local Government Board (England) on the pandemic of 1889-90, also drew attention to this condition amongst horses in London and various parts of the provinces, called by some 'Influenza'. In the large stables of London for instance, a large number of the horses were rendered unfit for work in October 1889, shortly before the appearance of the human epidemic there.

E. Symes Thompson (Infl. or Epidemic Catarrhal Fever, London. 1890) was so struck with the intimate relationship between human influenza and "pink eye" of horses, that he wrote to the December issues of the British Medical Journal of that year, pointing out the probability of the equine epizootic being the cause of the human influenza epidemic. There are, however, at least five facts which militate against this theory, viz:-

(1). It is well nigh impossible to inoculate horses with the human influenza.

(2). Influenza was conspicuous by its absence from mankind during the great horse epizootic of 1872 - 73, in North America.

(3). During the epidemic of 1889-90, horses were not affected in the same proportion as human beings; and, whilst the influenza raged at Newmarket, no similar affection prevailed amongst the horses there.

(4). The bacteriology of the two diseases is entirely different - Pfeiffer's bacillus in the one case, and the streptococcus claimed to have been discovered by

Schutz in 1888, in the other.

The Epidemics of 1891, 1892, 1893, 1894, & 1895.

References.— F. A. Dixey (Influenza 1892). Sir Peter Eade (Medical Notes and Essays, 2nd Edition, 1896) and various writers in the medical papers, and transactions of societies.

THE EPIDEMIC OF 1891.

Area of Prevalence — London, East Anglia, and various parts of England.

Peculiar Symptoms.— Profuse nasal and bronchial catarrh; severe pains all over the body; nausea and vomiting; diarrhoea; "nona" and coma; nervous sequelae.

Meteorology.— Variable weather; unusual rainfall.

Coincidences.— "Pink eye" amongst horses.

Duration. From January to October.

THE EPIDEMIC OF 1892.

Area of Prevalence.— East Anglia, London, Paris, Berlin, and other large cities.

Peculiar Symptoms.— Respiratory troubles very common, other symptoms like last year.

Meteorology.— Temperature of the atmosphere above the average. The epidemic was of more sudden onset than last year; and was more widely diffused.

THE EPIDEMIC OF 1893.

This epidemic prevailed chiefly during January and February, and was characterised by the greater frequency of nervous disorders, primary and secondary; delirium, mental, excitement or mania; and cerebral or cerebro-spinal inflammations.

Coincidence.— Asiatic cholera broke out in Europe.

THE EPIDEMIC OF 1894 - 1895.

This epidemic was prevalent from December 1894 to February 1895, during unusually cold weather, there being long continued frosts with the snow several inches deep. There were, however, during the frost only sporadic cases; but, with the thaw in the spring, the disease became pandemic, and especially virulent in London.

Pulmonary complications were very common; headaches, spinal and muscular pains were often very marked; and there was more bronchial secretion than in the previous years; constipation at the outset, and cyclic regularity of the temperature were very remarkable.

THE ORIGIN AND PROPAGATION OF INFLUENZA.

Tessier's Theory. - Tessier (L'Influenza en Russie - pamphlet - 1891) holds that the influenza is always in existence in the soil of Russia, at least in a latent form; and he traces its origin to the dirty and unhealthy way in which the lower orders of the populace exist, together with bad drainage, soddenness of the ground on thaw, accumulations of dirt, sudden rise and overflow of rivers leaving putrid mud on their fall, the same containing the bacillus.

Against Tessier's theory we have the fact of similar circumstances existing in other countries not giving rise to epidemics; also the fact of influenza appearing in marked epidemic form at long and irregular intervals.

The Inundation Theory. - This was first promulgated in the "Times" of the 11th of January 1888, and attributes the origin of the more recent epidemics to the inundations, during 1888 and 1889, which took place in Manchuria and other parts of China, whereby some 100,000 persons were drowned their bodies and decaying vegetable matter forming an hot-bed of decomposition, poisoning the whole atmosphere of China. It has even been said that the sun

was actually obscured by the air being filled with the fine yellow mud left behind by the flood, and evaporated by the sun. This mud, containing the germs of influenza, was supposed to be blown by the winds all over the earth, thus disseminating the disease broadcast.

The origin of the influenza has usually been located to China, even by the Russians. The theory, however, is upset by the fact of China only being infected second hand, by the arrival of an English mail steamer at Hong Kong in January 1890, having several cases of the influenza on board.

Harries's Theory.— Harries (The Origin of Influenza Epidemics. Proceedings of the Royal Meteorological Society, Feb. 17. 1892,) attributes the epidemics since 1883 to the great eruption in that year, of the volcano of Krakota, in the Straits of Sunda. From this a vast mass of dust was shot 24 miles into the air, the same taking seven years to fall to earth again. in the meantime being blown all over the earth.

Against this hypothesis we have the fact of no epidemic of importance occurring until 1889 - not immediately; and also the absence of the disease in the neighbourhood of the volcanic eruption generally.

Theory of its Origin in the "Pink Eye" of Horses.— We have already touched upon this question in a preceding section. The theory was first advanced from the fact of the epidemic of 1889 - 90 being immediately preceded by an outbreak of equine influenza - the so-called "pink eye", which was said to be transmitted to mankind. This seems very unlikely as the equine disease had existed more or less every year and only to a small degree in 1889. Also when it became most virulent the human malady was milder. It was noticed that the attendants on horses shewed no special susceptibility to influenza. The "pink eye" was often observed to be entirely absent from the districts in which influenza raged.

The Contagion Theory.— Influenza is now believed, by almost everyone, to be an essentially contagious disease, and due to the entrance of Pfeiffer's bacillus into the

system. The disease spreads from one person to another with extraordinary rapidity, by direct contact of fomites. It has nothing whatever to do with climate, season, wind or weather, however much coincident phenomena may point to the contrary. It simply follows the ordinary lines of human intercourse. The germ may remain in a dormant condition at any time. and under favourable conditions lead to another outbreak of the disease.

Influenza cannot travel faster than human beings, and in many cases the diffusion of an epidemic has been slow indeed. During the German army epidemic in 1883, it took the malady as long as three months to travel from east to west amongst the larger garrisons. Hence, the more perfect the means of communication between peoples at a distance, the more rapid will be the propagation of a particular epidemic. We have already noted how the germs can be conveyed by fomites; no wonder then that it can travel immense distances by either land or water.

A short digression by way of describing more fully the epidemics of 1889-90-91, will bring these points out more fully. This famous pandemic commenced suddenly, after a cold winter, in the spring, at Bokhara in Central Asia, so we are told by Heyfelder (Zur Infl. Epidi in St. Petersburg, Wiener Klinische Woch., 1889. p. 986.) who happened to be temporarily resident there. It appears, from his account. that the people of Bokhara had been greatly debilitated by the lack of food and the religious fast. The disease killed a large number of the natives, and attacked practically every other person in the place. The epidemic seemed to be a combination of the nervous and catarrhal types. It first attacked those living in the basements of houses, schools, barracks, and crowded buildings. From Bokhara, the disease was carried by the Europeans westward along the stations of the Central Asian Railway, and eastward by the ordinary caravans. It thus became prevalent over Siberia and Russia, reaching Astrakan by October. The time taken for it to travel over isolated regions in central Asia was 15 weeks, a

distance of 1,600 miles. The epidemic reached Ssaljan, in the Caucasus, on the 25th of October, where it spared neither sex, age, nor person. It arrived at Tomsk, in Siberia, about this time, where it received the name of "Siberian Fever". Outbreaks now occurred at Moscow, Kaluga, Vilna, and Sebastopol. From Moscow it soon travelled along the railroad to St. Petersburg, and western Europe, where it was designated "Russian Influenza". However, much authorities differ as to the exact date the influenza reached the Russian capital, it was well established there by the end of October, where it raged until the beginning of December, (Drachek Uben Infl. Wi. Me. Woch., 1890, 6, 17, 19, 21; and Clemow, The Epidemic of Infl., Brit. Med. Jour., Dec. 7. 1889, and Jan, 4, 1890). From thence it rapidly spread to Berlin, Cologne, Paris, the German ports of the Baltic, Denmark, Sweden, and Norway. Having reached Vienna, it spread to the large provincial towns, and thence to the smaller villages. From Cologne it passed on to Brussels, and diffused itself over the whole of Belgium and Holland. A ship from Amsterdam carried it to the American Continent. From France it crossed to England, reaching London about the middle of December 1889. The epidemic became well established in the English capital by Xmas, and reached its height in January, scattering itself over the provinces by February. It reached Leith in December, being brought there by a ship from Riga. The epidemic reached Ireland in January. The disease, therefore, became pandemic over the whole of Europe, Asia, and America.

Objections to the Contagion Theory Answered.-

1. The supporters of the "air-borne miasma" theory state that influenza spreads with much greater rapidity than human beings can travel, even by express train. A careful study, however, on the contrary proves that the epidemic manifested no great celerity in its propagation; for example, it took to the end of October to reach St. Petersburg, 5th of December Paris, 2nd December Berlin, 10th December Munich, and 11th of December Brussels. Human beings can travel on the Continent very much faster than that.

The influenza also takes a long time to traverse the ocean; three weeks elapsed before it got from St. Petersburg to New York, which journey can now be done in less than two weeks. It took as long as two months to reach the Cape, three months South America, four months India, and ten months St. Helena.

2. The same theorists attach great weight to spectacle of influenza seizing hold of whole populations at the same time. They lose sight, however, of the fact that, wherever the disease has manifested itself in this way, there were always at least a few cases in the district from which the rest were infested. In London, for example, several isolated cases were encountered for at least three weeks before large masses of the population became affected; and the same was noticed in many of the large cities of Europe. The same objectors also lose sight of the exceedingly short incubation period of the disease, so that it practically passes immediately from one person to the other. So long ago as 1843, Sir Thomas Watson in his lectures on the Principles and Practice of Physic in London, stated that "Although the general descent of the malady is very sudden and diffused, scattered cases of it, like the first droppings of a thunder shower, have usually been remembered as having preceded it".

3. It has been urged that, granted influenza to be contagious, why does not everyone take it? The answer is very simple; other contagious diseases do not attack everybody, many persons having the power of resisting the contagion. This is a well-known fact exemplified especially in the case of medical men & nurses. The contagious nature of the disease is also still further indicated by the fact of persons who associate with one another at work or business taking the influenza before those depending upon them and remaining at home; for the reason that the former have more frequent opportunities of coming in contact with the infection than the latter.

4. The partisans of the theory of atmospheric transmission state that influenza has often broken out in the absence of any known source of infection. We know, however, that the same can be said of similar diseases, such as smallpox and scarlet fever. Again, many cases of influenza prevalent in a locality are of such a very mild nature as to escape attention, and are perhaps put down to "cold in the head", and the like. They likewise forget that the disease can be easily conveyed by fomites, parcels, and the like, of which we have already given instances.

THE DIAGNOSIS OF INFLUENZA.

Usually an attack of influenza can be easily recognised, even by the patient, although anything partaking of the nature of a cold with feverishness is too often put down to the disease. The presence, however, of other cases of influenza in the district, and the possibility of the patient having recently been in contact with them, will be very helpful in clearing up the difficulty.

Further difficulty may be experienced in distinguishing cases of influenza which begin with symptoms resembling otitis, enteritis, scarlet fever, measles, rheumatic fever, ulcerative endocarditis, septicaemia, or typhoid fever; here again the history of the case will be of the utmost diagnostic value.

In very doubtful cases, the diagnosis can be formed by a bacteriological examination of the expectoration or blood, the bacillus of influenza being only present in that disease, and no other, no matter how similar the symptoms may be.

Great difficulty is sometimes experienced in diagnosing the complications or sequels; here again the general history of the illness must be carefully considered. In all doubtful cases Althaus (Infl., p. 314) attaches the utmost diagnostic importance to the state of the pulse, which is nearly always quick and of low tension after influenza, from paresis of the vagus nerve. In some cases, especially general paralysis of the insane and diseases of the spinal cord following the grippal attack, he has found this to be the only symptom by which the sequelae could be distinguished from the ordinary form of these maladies.

Diagnosis from Dengue.

Some observers have gone the length of saying that influenza and dengue are one and the same disease; whilst others - the vast majority - consider them to be entirely different. A variety of opinion may be had by reference to the writings of ;-

- Ringwood.- (Dengue of Infl., Brit. Med. Jour., June 27th 1891).
- Scottowe.- (Epidemic of Dengue Fever, Lancet, July 5. 1891).
- Sandwith.- (A Comparison between Dengue Fever and Infl., Lancet. July 5. 1890).
- Peter.- (La Dengue, Bull. Méd. Jan. 19. 1890).
- Le Brun.- (La Grippe et la Dengue, Rev. Méd, Paris, Feb. 1891).
- Godding.- (An Ovscore Outbreak of Dengue, Brit. Med. Jour., Feb. 15. 1890).
- Villard.- (Leçons Cliniques sur la Grippe, Paris, 1890).
- Diamantopulos.- (Dengue Fever and Influenza Epidemic in Smyrna. Wiener Medicinische Presse, 1890. 28, 29, 31, 33.

The two diseases certainly resemble one another in being propagated by personal contact alone, and in being quite independent of atmospheric influences. Dengue also affects all persons indiscriminately. sparing neither age, sex, or race. It is conveyed from one locality to another by infected persons, and likewise, by fomites; it has a short incubation of four days and a sudden invasion. It has a pulse very similar to that of influenza, as well as symptoms of fever. giddiness, headache, delirium, epistaxis, metrorrhagia, bodily pains and prostration. In it also, relapses are common.

D i f f e r e n t i a l d i a g n o s i s.

	Dengue.	Influenza.
Localisation	Hot countries	All latitudes.
Duration of epidemics.	3 - 5 months.	1 - 2 months.
Extension.	Slow & from circumscribed areas.	Rapid, & invading large tracts at the same time.
Onset.	Always sudden.	Usually sudden - sometimes strikingly so.
Temperature.	Always very high.	Uncertain; not usually very high.

Nervous symptoms.	Lassitude, pains in head & limbs.	The same, often with tendency to comelence.
Larynx & Trachea	Seldom affected.	Frequently affected.
Dyspnoea.	Seldom or never.	Frequent.
Exanthema.	Constant & characteristic.	Seldom; irregular in presence & description.
Headache.	Feeling of tension.	Sharp, internal, often neuralgic in character.
Complications.	Rarely the heart, liver or kidneys or lungs affected.	Lung affections frequent, principally bronchitis and Broncho-pneumonia.
Convalescence.	Very tedious.	Usually quick; sometimes protracted.
Prognosis.	Always favourable.	May be very unfavorable if complications.
Lower animals affected.	Dogs and cats.	Horses, especially but also dogs, possibly cats.
Incidence as to age.	All ages indifferently.	Principally adults; more rarely children.
Mortality.	Hardly ever fatal.	Frequently fatal.

(Adapted from Dr. Limaricis of Constantinople; British Medical Journal of January 1890.)

The above table presents the main points of difference between the two diseases in a nutshell, as it were, but a few remarks upon the rash of dengue may be very apposite. This eruption is very peculiar and characteristic of dengue which sometimes, in consequence, goes by the name of "red fever" (*fièvre rouge*). Dengue has two kinds of rashes. The first is of a congestive character, and is noticeable upon the mucus membrane of the eyes and throat. The second is more permanent, and appears towards the end of the disease, or even during the convalescence. It may be of the nature of an erythema or of papules, and is chiefly distinguishable on the hands, forearms,

body and neck. It is followed by desquamation, and the most intolerable itching. This condition of cutaneous irritation may last for weeks, during which time the skin of the hands and forearms may be shed in great flakes. We never find this sort of thing in influenza, which possesses sometimes only a very evanescent eruption.

Diagnosis from Malaria.

In the vast majority of instances, influenza can be distinguished from malarial fever with ease, by taking into account the prevalence of the former malady far away from any source of malarial poisoning; its failing to respond to quinine in the same way; the course and history of the epidemic; the temperature wave; the immunity of the spleen from great enlargement; and the absence of the great relapsing tendency of malaria.

Diagnosis from Typhoid Fever.

The gastro-intestinal form of influenza may be confused with typhoid fever, but the following points will distinguish.

<u>Influenza.</u>	<u>Typhoid Fever.</u>
Begins suddenly.	Begins slowly.
No regular temperature curve.	Characteristic curve.
No " eruption.	Eruption pathognomonic.
No serum test.	Widal's serum test.
Pfeiffer's bacillus.	Typhoid bacillus.

(Character of the epidemic in both cases.)

Diagnosis from Cerebro-spinal Meningitis.

Influenza may resemble this disease in its sudden onset, headache, delirium, muscular stiffness, and backache, but bacteriological examination will disclose Pfeiffer's bacillus in the one case, and the meningococcus in the other. For this Quinke recommends a lumbar puncture so as to get at the cerebro-spinal fluid. The nature of the prevailing epidemic is also of the utmost diagnostic importance.

Diagnosis from Acute Lobar Pneumonia, or Pneumonic
Fever.

Acute Lobar Pneumonia.

The inflammation is strictly lobar. More apt to be lobular.
Has a cyclic course.
Viscid rusty sputum containing the pneumococcus.
Critical defervescence.

Influenza.

Has not.
Sputum not always rusty & contains Pfeiffer's bacillus.
More gradual defervescence.

Diagnosis from Measles.

Measles may resemble influenza in its catarrh, high temperature, and depression; but it can be distinguished by its characteristic eruption, redness of the palate, character of the prevailing epidemic, and general history of the case.

So also Scarlatina, and other febrile diseases in children.

THE PROGNOSIS OF INFLUENZA.PROGNOSIS OF THE FEVERISH ATTACK.

Influenza is not in itself a serious disease; hundreds recover under appropriate treatment, and this is the usual thing. In order to arrive at satisfactory conclusions it is necessary to study the statistics of epidemics.

Statistical Consideration.-

The mortality tables of the civil population of London &c. are of little use, being lacking in information, regarding the exact number of cases of influenza under treatment at one time. Recourse may, therefore be had with advantage to the

German Army Statistics. (Die Grippe- Epidemic im deutschen Heere, 1889-90; Bearbeitet von der Medicinal-Abtheilung des K. Preuss. Kriegsministeriums, Berlin, 1890). It was published by order of the German Minister of War, and is full of interesting information as to the liability of fatal issues or sequelae.

The report deals with the influenza outbreak between November 1889 and March 1890. It comprises a summary of 55,263 cases; 54,805 (99.3%) of these were cures; 60 (9.1%) died; 174 (9.3%) were discharged disabled; and at the close of the epidemic 224 cases (0.4%) remained under treatment.

The average duration of treatment was only 5.65 days, in the middle of the epidemic, and 3.6 days at the commencement.

Complications and sequels occurred in 1,735 (3.1%), chiefly from pneumonia, otitis, neuralgia, pleurisy, and inflammation of the trachea - in that order of frequency.

Death took place in -

31	cases	of	pneumonia.
1	case	"	gangrene of the lungs.
6.	cases	"	pleuro-pneumonia.
2.	"	"	pleurisy.
5.	"	"	tubercle in the lungs.
1	case	"	cedema of the lungs.
"	"	"	bronchitis.
1	"	"	meningitis.
1	"	"	abscess of the brain.
2	cases	"	pericarditis.
1	case	"	endocarditis.
1	"	"	pericarditis and rheumatic fever.
2	cases	"	peritonitis.
1	case	"	septicaemia after otitis media.
1	"	"	hepatitis.
1	"	"	enteritis.
1	"	"	typhoid fever.
1	"	"	suicide during delirium.

Deducting from the above the case of typhoid fever, which had probably nothing to do with the influenza, we have 59 deaths, representing a mortality of 0.107, a brilliant result of the treatment of such a severe epidemic.

Occurrence of Complications in Civil Populations:-

Althaus (Infl., p. 324.) holds that complications and sequels occur in about 20 per cent, of those attacked.

Leichtenstern (Mittheilungen über die Infl. in Köln, Deut. Med. Woch, May 29. 1890.) found in the Cologne Hospital some 40 per cent, of the cases to be complicated. This large number - as compared with 3.1 per cent, in the German army - can only be due to his cases being of extraordinary severity. Again, the soldiers of the German army constitute, by the very nature of their existence, the most healthy class in the land, and on feeling ill are placed under treatment without delay, in terms of the orders issued by the Minister of War. The inmates of the Hospital, on the other hand, were drawn from the poorest and most unhealthy class, many of whom

delayed in presenting themselves for treatment, and existed under the worst conditions.

Deaths in Paris.-

<u>When there was no Influenza.</u>		<u>When there was Influenza.</u>	
Persons.		Persons.	
Third week of		Third week of	
December 1888	982	December 1889.....	1,626
Fourth do. do.	955	Fourth do. do.....	2,374
From Decr. 30, to		From Decr. 29, to	
Jan. 5, 1889.....	970	Jan. 4, 1890.....	2,683

In the same city, the respiratory Mortality was:-

<u>When there was no Influenza.</u>		<u>When there was Influenza.</u>	
Persons.		Persons.	
From Decr. 22, 1888		Same time in 1889-	
to Jan. 4, 1889:-		1890.	
Of inflammation of			
respiratory organs ...	400	" "	1,541
Of consumption	349	" "	886

Deaths from Influenza in 1890.-

Week ending January 4.....	4 deaths.
" " " 11.....	67 "
" " " 18.....	127 "
" " " 25.....	105 "
" " February 1.....	75 "
" " " 8.....	38 "
" " " 15.....	30 "

Total Deaths per Quarter.-

In the first quarter of 1890 the deaths amounted to	558
* " " second " " " " " "	47
* " " third " " " " " "	16
* " " fourth " " " " " "	27

* In only one week of each of these quarters was there no fatality.

It is a noteworthy fact that the deaths in London from influenza were much less than in the epidemic of 1847-48: when, the population being much less, the number of deaths

was 1,161 in the last quarter of 1847, and 588 in the first quarter of 1848.

Mortality of the London Epidemic of 1891.—

The unfortunate fact has here to be noted that the epidemic of influenza in London in 1891 was much more serious in its effects than the epidemic of 1890.

By the third week in May	the deaths	amounted to	319
" " fourth " " " " " "	"	"	310
" " first " " June " " "	"	"	303
" " second " " " " " "	"	"	249
" " third " " " " " "	"	"	182
" " fourth " " " " " "	"	"	117

At the end of the fourth week of June the deaths were 56.

During the eleven weeks in London, the number of deaths from influenza alone amounted to 1,997. Adding to these the number of cases which suffered from the disease in the German and English armies, we find that no less than 648,000 people in 1890, and 1,997,000 in the epidemic of April 1891, suffered from influenza; the average mortality being 1 in 1,000 (or 2 in 1,000 according to Althaus) giving 324,000 cases for 1890, and 998,500 for the epidemic of April to June 1891.

Effect of Influenza Epidemics on the Public Health.—

In considering this important question, a serious difficulty has to be faced at the outset in the fact of our having no system of registration of disease in Britain. To quote Thomas Sydenham's classical expression, the whole "epidemic constitution" changes for the worse with the advent of an influenza epidemic, a wave of depression and debility being left in its wake, in addition to the constitutional disturbances during its presence.

Sir J. W. Moore, in the course of his article on influenza in the fifth volume of the Encyclopaedia Medica (p. 271), concludes, with reference to Dublin, from actual observation of the 1889-90 epidemic, as follows:—

1, The epidemic of influenza was more pernicious to the population of Dublin than the extreme cold of January 1891.

2, It slew its victims, not so much directly as by means of complications and sequellae, affecting the breathing organs and the heart.

3, It spared the lives of children of tender years, but killed large numbers of adults and those advanced in life.
 4, Its effects upon the death rate were sudden and pronounced, and lasted for at least seven weeks, or throughout the month of January, and the first half of February.

The effect of the epidemic in London was to increase the general death-rate, with the result that the number of deaths exceeded that of the births by:-

The week ending January 4, 1890.....	423
" " " " 11, "	810
" " " " 18 "	765
" " " " 25 "	260

The total number of deaths came to 2,258 above the average of the corresponding weeks of the previous years.

A careful study of the statistics of influenza leads one to the inevitable conclusion that no other disease except cholera has such serious effects on the health of the community and the death-rate, whilst it lasts.

Influence of Alcohol upon the Prognosis.-

However favourable the prognosis may be in ordinary persons, the death-rate is always frightfully high amongst drunkards. Alcohol seems almost entirely to destroy, even in simple cases of influenza, the resistance to the disease, whereas old persons, provided they be of temperate habits, as a rule survive it.

Existing Phthisis is, of course, of grave prognostic significance; so also heart disease, hyperpyrexia, and respiratory crises.

Prognosis in Children. -

In these cases, it is practically always favourable, except, of course, when complicated. The younger the patient, the better the chance of recovery, probably because children get better looked after than adults, and are put to bed, and kept there, immediately on taking ill. Very young children seem to enjoy a comparative immunity from influenza, or take it only in a very mild form - a sort of ephemeral fever with sweating crises, and subsequent catarrh. Nevertheless, the "child-type" of influenza has been known to prove fatal, and of this Hilton Fagge (Text Book of the Principles and Practice of Medicine, 3rd. Edn., 1891, vol. 1,

p.1127.) testifies.

On the other hand, however, Fleetwood (Dublin Journal of Medical Science, 1847.) states that Churchill had the supervision of some sixty cases, from January to February 1847, from amongst the Dublin children (whose ages ranged from two months to fourteen years) without encountering a single death.

PROGNOSIS OF THE COMPLICATIONS AND SEQUELLAE.

1, Mental Affections. - These cases usually recover from the influenza attack itself.

The First Class (Neurasthenia, Hypochondriasis, and Melancholia) usually have a good chance of recovery, if properly looked after. The ailment itself is not very serious; but many cases are apt to develop into insanity. At the same time, one must not forget the possibility of suicide, to the frequency of which attention has been drawn by Snell (Infl., Allg. Zeitschrift f. Psychiatrie, Berlin, 1890, p. 418.), and Martin (Cited by Ladame: Des Psychoses après l'Infl., Annales Médico-psychol. Paris, 1890, p. 20.).

The Second Class do not often recover (Delirium of Inanition and Collapse), but if they do, a condition of permanent dementia is almost sure to remain.

The Third Class (Mental Affections grafted on Pre-existing Neuroses) usually recover, but an opinion of any value can only be expressed by observation of the particular case.

The Fourth Class (General Paralysis of the Insane). The prognosis in these patients must be always bad.

Althaus, however, thinks that if vigorous measures be adopted early, the outlook is not so hopeless as one might otherwise suppose. On page 95 of his work on influenza, he describes a case in point.

2, Diseases of the Brain and its Membranes. -

In cases of haemorrhage the prognosis is very unfavourable. So also in cases of severe hyperaemia, inflammation and abscess, but in embolism and thrombosis the prognosis is not quite so bad.

3, Diseases of the Spinal Cord and its Membranes. -

The prognosis here is not nearly so unfavourable as in the case of the foregoing. Such cases usually last longer, and, therefore, allow more time for the exhibition of suitable remedies.

4, Diseases of the Peripheral Nerves. -

These, unless shewing the reaction of degeneration and muscular wasting, respond very well to treatment.

Angina pectoris is, however, very unfavourable, as it is practically incurable.

5, Diseases of the Sympathetic Nerves, and General Neuroses. -

These usually recover satisfactorily under treatment, but it must be persevered with for a lengthy period.

6, Diseases of the Eye. -

Optic neuritis, optic atrophy, and embolism of the central artery of the retina, seldom improve under treatment. Other ocular affections have a fairly-good prognosis.

7, Diseases of the Ear. -

Though painful and annoying, aural affections usually recover much more quickly than ocular diseases.

8, Diseases of the Circulatory Organs. -

Simple endocarditis is usually curable: the ulcerative form frequently fatal, and always of unfavourable prognosis.

9, Diseases of the Respiratory Organs. -

These are a prolific cause of death during epidemics, the mortality from bronchitis and pneumonia alone, being from 50 to 80 per cent. Occurring in the alcoholic and the aged, they are always of grave omen.

THE TREATMENT OF INFLUENZA.

It may be as well to state at the outset that there is no specific for influenza, and the treatment, therefore, cannot be conducted upon hard and fast lines. It is for the greater part based upon common sense principles, and is in essence expectant, palliative, and symptomatic. As stated in a former section, we have not even a method of rendering the patient immune, although we are now not entirely without hope on that point.

In spite of the disease having been prevalent for a great many years in epidemic form, at intervals, it was not, perhaps until the winter of 1892-3, or thereabout, that special and widespread attention was directed towards combatting the gravity of its after-effects and the seriousness of its clinical manifestations. Owing to the number and variety of the latter, the difficulties presented in treatment were very great, and the results at times correspondingly disappointing.

Success was doubtless very common in mild cases, and to this such great importance was attached that the writer can well remember with what enthusiasm successful results obtained from the exhibition of some unimportant drug, e.g., bicarbonate of potassium, were published in the medical papers; and how it was therein stated that such a remedy had been given in so many hundreds of cases "without a death"; and so on with regard to salicin, antipyrin, and many other drugs, each experimenter endeavouring to prove that his particular remedial agent was in reality a specific.

With the "wave of specifics" - towards its subsidence at least, and perhaps during it - there were to be found many clinicians chary in allowing factors such as the above to mislead them, and gradually routine drugs, such as antifebrin, exalgin, and those mentioned above, ceased to be given so lavishly, their exhibition being reserved for special indications, especially at the beginning of the influenza attack; especially as the results obtained, when analysed were found in reality to be no better than our forefathers in medicine had secured with the older and reliable remedies, such as Dover's powder, acetate of

ammonium, &c.

We have now, therefore, ceased to look upon any drug as a specific for influenza, and there is no longer any routine treatment adopted, especially as regards the depressing coal-tar derivatives. Even the much vaunted salicin has lost much of its popularity - except perhaps at the beginning of the disease, when it seems to be useful - and a tonic treatment has now come to be substituted for that of careless exhibition of the synthetics, which have such a depressing effect upon the heart - already weakened by the disease - and which one is apt to push too far, and with lack of caution, knowing well how they relieve the pains and discomfort of influenza more quickly and thoroughly than any other drugs. Generally speaking, their effects must be carefully watched and tonics substituted as soon as the acute symptoms of the influenza attack have subsided.

PROPHYLAXIS.

(A), By Drugs. -

Quinine was recommended at one time to be taken by all and sundry during the prevalence of an influenza epidemic, in order to protect the system against the risk of contracting the disease. Experience, however, goes to prove that it is practically useless for this purpose, although such a high authority as Sir J. W. Moore (Ency. Med., vol. v., 1900, p. 289.) seems still to have faith in it.

Graeser (Berliner Klinische Wochenschrift, 1889, 51.) records how he was once inclined to regard with favour its tentative and prophylactic exhibition, and his loss of confidence in it after administering daily doses of the drug ($7\frac{1}{2}$ grains) to the Prussian Hussars at Bonn, with the result that influenza broke out amongst them in spite of it.

The spirit of scientific fairness, however, demands that we allow that the drug has occasionally appeared to have some prophylactic utility. Tranjen for instance, (Berliner Klin. Woch., 1897, 7.) claims to have prevented the spread of an outbreak of influenza, in a certain regiment, by giving the drug to all the soldiers for three days. It is just possible, however, that this might have still

have happened had the quinine been withheld.

The drug also failed to protect the cadets of the military school of Glogan in Prussia, to whom it had been regularly administered for some time prior to the outbreak. Curiously enough, the number of sufferers amongst them was even double those of the garrison at Glogan.

Cod-liver Oil.— Ollivier, (*La Prophylaxie de la Grippe*, Acad. de Méd., Feb. 2, 1892; *Progrès Méd.*, Feb. 5, 1892.) with much enthusiasm, recommended this preparation to the French Academy, as an unfailing preventive of grippal infection by obviating the possibility of one's catching cold, without which no one need ever be afraid of taking the influenza. He stated how he had given it, with unfailing regularity, to some thirty children, in dessertspoonful doses, during the epidemic of 1890, with the result that not one of them took the disease, whereas several of their brethren and associates had severe attacks.

Faith in the efficacy of the oil, however, was upset at the very next meeting of the Academy when Gautier (*Progrès Méd.*, Feb. 5, 1892.) informed the members that the influenza had attacked some 45% of his patients in the Narbonne, all of whom had been taking the oil with unfailing regularity.

Why cod-liver oil should have been selected as having a special prophylactic action is not easy to understand; for, if it is given for the sake of its iodine, a much more convenient and scientific plan would have been to dose the patients and others with one of the iodides. On the other hand, if the action of its fat was sought, a much more palatable form might have been exhibited.

Salicin.— We shall note the action of this drug later, and in addition also to what has been noted regarding it above, it may be noted that it was first recommended as a prophylactic by Maclagan (*The Nineteenth Century*, Feb. 1892; & *Brit. Med. Jour.*, Jan. 11, 1890.) who claimed to have warded off the disease for several weeks by taking the salicin in doses of ten grains three times a day. Failing to take it one morning, he, a few days after, was attacked

by the influenza.

Other Drugs.-

Amongst the large number of supposed prophylactics not already referred to, are such drugs as Resorcin (in mouth-wash or spray, oil of eucalyptus, thymol, pumilio oil, pine oil, and other similar antiseptics in the form of inhalations.

One naturally looks to this class of remedy, knowing what we do of the bacillus of influenza, and its most common location in the secretions of the respiratory system, from which favourite habitat it may be absorbed, and so infect the host. It is, therefore, a rational and strictly scientific procedure to have early recourse during epidemic times to antiseptic inhalations, sprays, gargles: and the like, to prevent the spread of the poison from the mouth, salivary glands &c, where it may be lying dormant.. The difficulty, however, is to get the laity to consent to such an irksome procedure, and it cannot, from the technical knowledge required, be always attempted except under the supervision of professional persons.

(B), By re-vaccination.-

Wholesale re-vaccination of the entire populace has been highly recommended by Goldschmidt (Berl. Klin. Woch., 1890, 50; & 1891, 45.) as a certain prophylactic. He was led to believe in it by observing that all those who had been re-vaccinated against the recent epidemic of smallpox (during the influenza outbreak at Madeira in February and March 1889) remained quite immune, whilst the influenza raged amongst the unvaccinated. In drawing his conclusions, he also took into account the comparative immunity of the well-vaccinated German army, as compared with the civil population of Berlin, and of Paris, where the number of persons (unvaccinated in adolescence) was about 42%. Furthermore, some garrisons entirely escaped the epidemic, and in no case were they attacked whilst the civilians enjoyed immunity. The average duration of the attack amongst the soldiers was only 5.65 days, and only 3.1% of these suffered from complications. The

influenza death rate amongst the soldiers was twelve times less than that of the civilians of Berlin, and twenty-five times less than amongst the Parisians. An equally significant fact, noted by Goldschmidt, was that the worst cases were those patients who had never been vaccinated.

The consensus of medical opinion is, however at variance with this theory of the supposed efficacy of vaccination as an influenza preventive, because the toxins and antitoxines of the two diseases are peculiar to each absolutely, and it is known that a certain toxine will only yield to its own antitoxine, and not to others.

(C), By Isolation.—

Richard Sisley (A Study of Influenza and the Laws of England concerning Infectious Disease.) strongly advocates the prompt isolation of all persons who have been exposed to the infection. Unfortunately, however, this proposition — excellent in theory — is impossible of execution in the great majority of instances met with in general practice; and would, if carried out on the scale he recommends, absolute paralyse during epidemic times the business and industries of the nation. Nor is it even necessary to isolate everyone exposed to infection, as so many of them have slight attacks. Again, the disease in its epidemic form is far too widespread for Sisley's proposal to be of the utility he desires; and even if a large number of contacts were to be, in accordance with it, isolated in the hospital, the propagation of the disease would not be greatly interfered with.

Nevertheless, some good may be done by sanitary Authorities advising the public as to the general measures to be adopted, as possibly prophylactic, during epidemics. The following suggestions, for instance, in placard form, issued by the Sanitary Authority of Manchester during the influenza epidemic of 1899 — 1900, may be productive of incalculable benefit to the community at large:—

"Precautions against Influenza".

"1, The sick should be separated from the healthy. This is especially important in the case of first attacks in a household.

- 2, Discharges from the nose and mouth should not be allowed to get dry on a pocket-handkerchief, or inside the house or workshop. They should be at once collected in a paper or clean rag and burned. If this cannot be done, the paper or rag containing the discharges should be dropped into a vessel containing water.
- 3, Infected articles should be cleansed and disinfected.
- 4, Those attacked should not, on any account, join assemblages of people for at least ten days from the commencement of the attack, as they are likely to convey the disease to others. In severe cases the person attacked should remain away from work for a period of at least three weeks from the onset of the disease.
- 5, During the epidemic special attention to cleanliness and ventilation should be shown in factories and workshops. Workpeople are advised to wear warm clothing and to avoid unnecessary exposure.
- 6, Persons who are attacked with influenza should at once seek rest, warmth, and medical treatment; and they should bear in mind that the risk of a relapse with dangerous complications constitutes a chief danger of the disease.
- 7, The attention of employers is especially called to these recommendations."

According to Dawson Williams (Incubation and Infectiousness, Twentieth Century Practice, vol. xiii, p. 383.), the period of isolation should always be a week or ten days after the commencement of the disease; and, when complicated with pneumonia, until the end of the convalescence.

(D), Disinfection.—

There are now many adherents to the view that procedures of disinfection may prevent an influenza attack, but they are by no means unanimous as to the best preparation to use.

Mivart (Brit. Med. Jour., Jan. 16, 1892.) believes in spraying the body and house with creoline, and states that he has prevented an entire household, in this way, from contracting the disease.

Cory (The Prevention and Treatment of Influenza, Lancet, Dec. 5, 1891.) on the other hand, strongly advocated the inhalation of a few drops of carbolic acid, from a pocket handkerchief, mixed with an equal amount of glycerine, before leaving the house each day. He also considers it within the bounds of possibility - and throws out the suggestion to Sanitary Authorities - to stamp out an epidemic in a locality by the free use of carbolic acid, creosote, and other disinfectants, in the streets and sanitary arrangements of houses. An important objection to such procedure is that of expense.

The great popularity of the oils of eucalyptus, pine, &c, during recent epidemics will not be easily forgotten. Their sale to the lay public must have been enormous. Unfortunately it is anything but certain that they have any kind of action on Pfeiffer's bacillus, the behaviour of which towards antiseptics, and the amount of same to be employed against it, being still doubtful.

Antiseptics, be it noted, have been subjected to a variety of searching tests in the German army, with the disappointing result that they seemed to have little or no action upon the influenza bacillus; indeed, the disease was often noticed to disappear more quickly from the garrisons where no disinfectants whatever had been used, and to be more persistent where they had been most freely exhibited.

It is only reasonable, however, to suppose that prompt destruction of the excreta, expectoration, soiled linen, and the like from the outset of the illness is always a most salutary and commendable procedure, just as in the case of other infectious diseases.

(E), Hot Air. -

Observation of the immunity of glass-blowers, working nearest to the furnace (temperature 1,000 degrees C.), and comparison with the occurrence of influenza attacks in from 50 to 60% of those working at a distance from the fire, led Heisler (Etiophylaxie der Infl., Münchener Med. Woch., 1890, 9.) to believe that the inhalation of exceedingly hot air was the sole cause of the immunity

described, and would, if practised, confer the same on others. This would obviously be impracticable in the case of the general public; but the idea rests upon a strictly scientific basis, and is, therefore, worthy of due respect.

(F). General Hygienic Measures.-

What applies to other diseases in this respect, does so, of course, to influenza.

A temperate, healthy, and sober existence, with special attention to the avoidance of chills and the like debilitating influences, are all measures which cannot be too highly commended during epidemic times. Their efficacy was fully tested during the French army epidemic of 1890, and led to the issue of the following circular orders, from the Minister of War, to the generals in command of army corps:-

"Drill in the open air is to be as short as possible especially in the morning. The men are not to stand still but to move about during the whole of the time. When expedient drill is to take place in closed rooms. In cold weather the men are to have flannel under-clothing and cloaks, and watch duty is to be restricted. The sentries are to be relieved every hour, and to be provided with thick cloaks. If there should be an outbreak of the epidemic the men are to have tea and sugar twice a day, in addition to the ordinary diet. On account of the frequent abdominal complications of the epidemic, the men are to have flannel belts. In all barracks, rooms should be allotted for those whose cases are slight, and for convalescents, so as not to crowd the hospitals, and such rooms should be properly warmed in order to avoid the prejudicial influence of cold on the respiratory organs. The surgeons are to give great attention to any cases of respiratory affections, however slight, more especially when occurring in men who are not robust; and in any of the men of weak constitutions the strict rules of service may be relaxed, if thought expedient."

During the same epidemic, similar orders were issued by the Surgeon-General of the German army. He prohibited drill, curtailed roll-call and parade, and

ordered flannel belts and coats to be worn by the men in the open air.

TREATMENT OF THE FEVERISH ATTACK.

Carbolised Curative Serums.-

Whilst we know of no specific for the disease, the researches as to the cure of tetanus, diphtheria, pneumonia, and mouse-septicaemia, by their respective antitoxines, made by such experimentalists as Behring (Die Blutserumtherapie bei Diphtherie und Tetanus - aus dem Institut für Infektionskrankheiten zu Berlin - Zeitschr. f. Hyg. u. Infektionskr. Bd. 12, 1892.); Wernicke (Über Immunisirung und Heilung von Versuchsthiereu bei der Diphtherie, Ebenda); and Klempner (Zu Lehre von den Beziehungen zwischen Immunität und Heilung, Berliner Klinische Wochenschrift, Mar. 28, 1892.), lead us to suppose, and earnestly hope that, in the near future, the feverish attack of influenza may be cured in a similar manner by means of a carbolised serum - containing the grippo-toxine - in a handy form for either oral or hypodermic use.

Quinine.-

However questionable the employment of quinine as a prophylactic may be, the drug seems to have an undoubtedly beneficial effect upon the febrile condition. It is usually exhibited in the form of the ammoniated tincture, in doses of a teaspoonful every four hours, or so. The ammonia in this particular preparation is especially beneficial for its stimulating properties, and meets the indication admirably. After the subsidence of the fever, the sulphate may be given, in the ordinary dose, with dilute hydrobromic acid and spirits of chloroform. It may even, in modified doses, be administered to children, suspended in a wine-glassful of milk flavoured with orange water. Should a rheumatic taint exist, the salicylate preparation may be given in wafer paper.

Burney Yeo (Manual of Medical Treatment, New Edn., 1902, p. 702.) holds that, from amongst all other drugs, quinine is the most deserving of confidence in treating influenza, and recommends its exhibition to be proceeded

with two or three days after the use of salicin.

Lessier of Lyons, and Dr. Gaillard of the Hospital of St. Antoine at Paris (La Grippe, Paris, 1898.) both consider quinine to be one of the most valuable medicines we possess and an actual preventive of the after effects of the toxine of this disease. Lessier maintains that it has an action comparable to the action of the salicylates in rheumatism.

In view of the disadvantages of its administration, Burney Yeo advocates its use only in small and frequent doses in combination with the citrate of potash and ammonia in effervescence, repeated every three or four hours; but if there should be profuse exhausting sweatings in the afternoon or evening, a single additional dose of five grains dissolved in lemon-juice should be taken at five in the afternoon. He states that given in this form, combined with an effervescing saline and preceded by a day or two of the salicin treatment, it will rarely be found to disagree even with the most sensitive patients; and that even if it should give rise to some headache or slight deafness, it is far better to bear with these trivial inconveniences than incur the risk of serious toxic after-effects.

For Art. Packard Hare (System of Practical Therapeutics, Hobart Amory Hare, 1901, p. 191.) states that he has found salicylate of cinchonidine to be of great use in the acute stage of influenza, and although very slightly depressing, he found it to be free from the disadvantages of quinine, which from its liability to induce otitis media is a drug to beware of in influenza. He advises it to be given in pill or capsule together with strychnine.

Salicin.-

We have already seen how this drug was vaunted by MacLagan, as a prophylactic, who, with Turner (Lancet, July 21, 1892.) recommended it as a cure for the disease. The average dose recommended was a large one - 20 grains - every hour at first, later less often.

Salicin, and the salicylates, are, according to Burney Yeo (Manual of Medical Treatment, 1902, p. 708.) are of use only to relieve the muscular pains, and for their sudoriferous action, and he maintains that in no way can the

former be considered as a specific, as once held, for the disease, and he holds that, when apparently curative, the attack has probably not been influenzal at all, but little more, perhaps, than a common cold.

Iodide of Potassium. -

This is one of the few drugs which can be thoroughly relied upon to be of benefit during all stages of the grippal attack. It is, as we have already noted, of especial benefit in allaying the congestive headaches, and it is frequently the only drug of use for certain complications.

Bicarbonate of Potassium. -

This has been recommended by Crerar (The Effectual and Speedy Cure of Influenza, Lancet, Dec. 19, 1891.) as an absolute specific in doses of 30 grains - with digitalis or ammonia if the heart is weak - every two or three hours. He claims for the drug certain remarkable advantages, of which three are especially noteworthy. -

(a), It destroys the power of the disease within 24 hours, generally within 4 or 6 hours.

(b), The strength of the patient is conserved, and the convalescence is short and satisfactory.

(c), Sequels are conspicuous by their absence.

Carried away by his ^henthusiasm, Crerar has made some rather ridiculous assertions as to the efficacy of the drug; for he states: - "If used before the attack it entirely prevents the disease; the death rate is reduced to a minimum; there has not been a single death in more than one thousand cases; it has more power over influenza than any method of treatment over any other disease; if adopted by the whole profession it would make influenza non-existent in one week; it rests upon a sound scientific foundation."

Antipyretics. -

Drugs of this class have been recommended by the score. The most they can be expected to do is to reduce the temperature, in some instances to allay the pain - both very important attainments. At the same time one must not lose sight of the fact that hundreds of cases have

got well, under rest and good nursing, without their being employed. The majority of these are proprietary preparations, and much recommended by their makers, but we shall content ourselves by naming a few of the more reliable and representative of them.—

Phenacetine.— Little that is reliable has been published about this drug to determine as to its having any extraordinarily efficacious action upon the course of an influenza attack..

Burney Yeo (Manual of Medical Treatment, 1902, p. 699 et seq.) considers it an valuable adjunct to the administration of quinine in cases of pyrexia and delirium.

Its exhibition was also most highly recommended by Henry (Phenacetine in Influenza, Brit. Med. Jour., June 13, 1891.) and Clemow (Ibid., June 27, 1891.) and Aston (The Treatment of Influenza, Ibid.) , in doses of from five to ten grains thrice daily, in wafer paper, milk, or suspension, owing to its solubility. Clemow considers that it is superior to both antipyrin and salicin, relieving the pains more quickly, and having no depressing effect. Aston found it to be especially useful in allaying insomnia. It had also a marked effect in allaying the neuralgic pains, especially if exhibited with the tincture of gelsemium. It is, however, far from being a safe drug to administer to children, in whom it has been observed to produce cyanosis or collapse, which disadvantage also applies to the following drug, viz.—

Antipyrin.— This is a very useful remedy in doses of 15–20 grains, especially if combined with the tincture of digitalis to counteract its depressing effect upon the heart. It has the advantage over phenacetine of being soluble in water. It may also be combined with quinine, or given in wafer paper if preferred.

In doses of 5 grains, once or twice cautiously repeated, Burney Yeo (loc. cit) has found it to give marked relief in the headache and gastro-intestinal pain. Acetanilidum (Antifebrin).—In doses of one to three grains, this drug acts in a similar manner to antipyrin, and is also not entirely free from depressing properties. It

may be combined with citrate of caffeine and given in wafer paper, thus forming a substitute for the well-known "antikamnia", which is said to consist of 7 parts antifebrin, 1 part caffeine citrate, and 2 parts bicarbonate of soda.

Sodium Salicylate. This drug has for a long time now maintained its popularity in influenza, and this seems to be in no way diminishing. It may be given either alone, or, better, with the effervescent citrate of caffeine.

It has a remarkable effect in relieving the rheumatoid pains of the disease.

Some prefer to use the salicylic acid itself; others the combination with phenol, known as salol; or in the form of salophen, the dose of the latter being 10-30 grains.

Salipyrin. - This preparation is a combination of 57.7% salicylic acid and 43.3% antipyrin, and is strongly recommended by Mosengiel (Practische Notizen, &c., Berliner Klin. Woch., June 29, 1890.). It is best exhibited in doses of 15 grains every two hours at first, less often later. It is insoluble in water, but has the great advantage in being free from depressing effects. An imitation of the drug can be improvised by administering the salicylate and the antipyrin together in mixture suitably flavoured. It has been known to allay the fever, prostration, insomnia, and neuralgic pains, when antipyrin and phenacetine fail to be of use, and the drug can, therefore, be relied on.

Carbolic Acid. -

This has been much vaunted by Simson (On the Treatment of Influenza, Brit. Med. Jour., Jan. 25, 1892.) in doses of two minims of the liquid B. P. preparation duly disguised.

Acetate of Potassium. -

This preparation has been highly recommended by Gray (Influenza, London, 1897, p. 67.), with or without the tincture of aconite.

Ammonium Chloride. -

The exhibition of this drug is advocated by Marotte (Bulle de l'Acad. de Méd., June, 1891.), especially in the catarrhal form of the disease, the dose being 8 grains

(in wafer paper), in all 50-80 grains in the 24 hours.

Camphor.-

In the form of the spirit, this drug is recommended by Long (Treatment of Influenza with Camphor, Brit. Med. Jour., Aug. 29, 1891.) in doses of 20 minims every four hours, combined with the spirit of chloroform and compound tincture of lavender.

Alcohol.-

It is unnecessary to dwell here upon the fact of this being a very popular remedy for influenza amongst all classes. The advisability of its administration must be left to the practitioner's own discretion, as indicated. It is perhaps best withheld until the febrile symptoms have subsided. Recognised authorities even differ as to the prudence or otherwise of its exhibition, so that the question may be left as above.

Dover's Powder (gr. 10.), or Sulphonal (rs. 20-30.) form excellent sedatives when the patient is restless, or is distressed by the insomnia; and the same applies to Liquor Trinitrini, in doses of $\frac{1}{2}$ - 1 minim of the 1% solution at night. This often causes the patient to fall asleep, the aged especially, when all else fails.

External Applications.-

Hot applications are of very great utility in dispelling the aching pains of influenza, so common and distressing in the earlier stages of the disease. The result desired may be attained by means of hot bricks (wrapped in flannel), or baked salt applied as hot as can be borne by the patient, in a bag.

Liniments, however, are not to be recommended owing to the irritation of the same on the skin, in which case the cure becomes more annoying than the disease itself.

Regimen.-

When attacked with influenza, the patient must go to bed at once, and be prepared to stay there as long as directed by his medical attendant.

The essentials of a cure of an ordinary uncomplicated influenza illness are warmth, perfect rest, and quiet, a

light nutritious diet, and good nursing: indeed, many cases get well on these alone.

The proper dieting of influenza patients often calls for more skill on the part of the medical attendant than the prescription of remedies. No special rules can be laid down; each case requires to be dealt with entirely upon its own merits. In the majority of instances, the diet should assume the liquid form, and it is here that the skill of the nurse would tell in making the food as tempting to the patient as possible. Numerous recipes for preparing broths &c. are to be found in the works devoted to invalid cookery. An excellent outline of the subject, which will amply repay the perusal, is given by Mrs. Chalmers, M.D., of Edinburgh, in the *Encyclopaedia Medica*, vol. v. p. 465, 1900.

The management of the convalescence is often no easy matter, the greatest difficulty usually encountered being to prevent the patient from getting out of bed too soon. The temperature is then very often subnormal (96 degrees) as Vintras (*Subnormal Temperatures in the Convalescence of Influenza*, *Brit. Med. Jour.*, March 19, 1892.) has pointed out; so that an unrestrained patient is exceedingly liable to contract a chill, and suffer from dangerous sequelae if allowed to expose himself to the cold before the temperature has quite regained the normal.

It is as well to beware of too much interference with the temperature of the febrile stage of influenza (and this is equally true of all fevers), for we know now that elevation of temperature serves a useful purpose if kept within a safe limit: for it purges, as it were, the system, and is, therefore, "the best ally of the physician" - to quote Professor Cantani in his Address on Antipyresis before the Tenth International Medical Congress at Berlin in 1890.

T. S. Dowse (*On Brain and Nerve Exhaustion*, 5th. Edn., London, 1895, p. 82.) where there is much irritability, or nervous vomiting, as in the neurotic class of cases, warmly recommends opium or morphina as the most satisfactory sedative. The following is an interesting case of his

proving its efficacy:- "A lady patient of mine, of a weakly constitution and highly nervous organisation, in whom the catarrhal symptoms were well marked, with persistent, profuse, and continuous overflow of tears, was suddenly seized with the most violent vomiting. I ordered her to take half a grain of morphia, to be repeated in three hours if the vomiting continued, when by some mistake the two powders were given at once. She slept soundly for ten hours, and awoke really comparatively well, with complete subsidence of the catarrh. Doubtless the vomiting in this case was due to an irritable and unstable state of the medulla oblongata. I was so pleased with the good effects of the morphia that I have invariably given it in full doses when from the symptoms I have been led to believe that the central nervous system was chiefly at fault, and even in cases of cardiac and respiratory failure, I have not hesitated to administer this drug freely, and with the most excellent results."

Tonics should be given freely during the convalescence. Of their number strychnine is the most useful to combat the tedious weakness. In the form of the liquor, its effects are much enhanced by giving it with dilute phosphoric acid, or with digitalis or strophanthis as indicated, the mixture being flavoured with tincture of orange and chloroform water. The mixture must be withheld for a few days should there appear any evidence, in the form of headache or pains, of strychnine accumulation.

TREATMENT OF THE COMPLICATIONS AND SEQUELAE.1, Mental Derangements.—

Here again, each case must be treated entirely upon its own merits, always remembering the great depressing effect of the influenza attack upon the patient's system, requiring diet and remedial measures of a supporting kind for its controlling.

Rest, above all things, is essential should the equilibrium of the mental faculties be disturbed. The patient must be kept perfectly free from all worry and, if possible, have an immediate change of air and associations.

Cases of this kind resolve themselves into four divisions, each of which requires special management:—

1st. Class: Neurasthenia, Hypochondriasis and Melancholia.—

These patients suffer very much as a rule from insomnia, and consequently derive very great benefit from sulphonal, paraldehyde, "bromidia", hyoscine hydrobromide, "dormiol", and the like, supplemented with frequent hot baths. Cardiac weakness being a conspicuous feature, chloral hydrate should not be given except in combination with digitalis. The dilute acids, with simple bitter infusions, may be given to increase the appetite, and the palate ought to be tempted with suitable and wholesome delicacies.

Tonics, such as strychnine, quinine, and phosphorus, are always indicated. When the pulse is weak, as it usually is, digitalis and strophanthus are most useful.

Due attention must, of course, be paid to the healthy action of the bowels, and the care of the digestive system, on the approved lines for their management.

Electricity is clearly indicated for this class of patient, and its value has been proved, beyond a doubt, over and over again. Althaus (Influenza, p. 352.) recommends it to be given in the form of the continuous current ($\frac{1}{2}$ - 2 m. a.) for ten minutes, to the region of the pre-frontal lobe and medulla, the same being a valuable method of stimulating the nervous system and its centres.

For the cure of nerve exhaustion, a variety of drugs

have been recommended. T. S. Dowse (On Brain and Nerve Exhaustion, 5th. Edn., p. 62, London, 1895.) believes that the most efficacious of them all is opium, and he recommends it in the form of the watery extract, in doses of a quarter of a grain three or four times a day. The development of the drug habit must, of course, be guarded against, as it seems to be most easily acquired in these patients. In spite of this risk, Dowse urges its exhibition for some weeks or months at a stretch. He even does not hesitate to increase the dose, and states that a good result is sure to follow its continued administration. He states - to quote from his work - "There are cases of pure neurasthenia, simulating premonitory consumption and a thousand other ailments, which the practised physician can pick out, and say most decisively that opium will cure. I must admit, however, that there are cases of nervous exhaustion which opium does not seem to affect. Among the other drugs which are at our command we find the following, and I give them in the order of their value, namely: arsenic, phosphorus, strychnine, the salts of bromine and iodine, the salts of zinc and iron, quinine, chloral, chloroform, ergot, maltine, grape sugar, cod-liver oil, atropine, sulphur, nitrate of silver, bichloride of mercury, and the tetrachloride of gold."

2nd. Class: Delirium of Inanition or Collapse.-

These cases require careful management, as they often die from heart failure consequent on bodily exhaustion. Alcohol is here indicated, and morphia may be allowed to allay the excitement or delirium. So also the bromide of ammonium, with digitalis or strychnine, proves of the greatest value.

3rd. Class: Mental Affections grafted on Pre-existing Neuroses.-

Here again, each case must be treated for its own particular indications. The iodide of potassium, with perchloride of mercury will perhaps prove to be of the greatest service. In addition, the indication is clearly that of a nutritious diet, rest, quiet, and change of air; but on no account should alcohol be given.

4th. Class: General Paralysis of the Insane. -

The treatment here is practically the same as in the former class; the iodide is specially indicated, and alcohol contra-indicated.

2, Diseases of the Brain and its Membranes. -

It is here difficult, and inadvisable to lay down a routine treatment. Ergot may be useful in checking the hyperaemia or multiple haemorrhages.

Whiteley (Lancet, Dec. 12, 1891.) recommends blood-letting for the relief of cerebral congestion, and there is no apparent reason why it should not be of service.

Inflammation, and Cerebral Abscess, on the other hand, call for the speedy exhibition of sedatives; when due to ear disease, a surgical operation has nearly always to be resorted to.

The perchloride of mercury and the iodide are the only drugs likely to be of service in cases of embolism and thrombosis, as they have a tendency to absorb the blood clot.

3, Diseases of the Spinal Cord and its Membranes. -

Acute Ascending Myelitis. - Although this disease is nearly always fatal, the iodide, together with purgation and spinal blisters, may be of service.

Spastic Spinal Paralysis. - The distinct indication in this disease is for the early administration of the iodide of potassium, to which arsenic may be added.

Locomotor Ataxy. - The iodide is of value in this disease also; likewise ergot, silver nitrate and galvanism.

Posterior Lateral Sclerosis. - The indication here is the same as in the foregoing diseases.

4, Diseases of the Peripheral Nerves. -

In this instance special indications must be met in the usual way, and as laid down in the text books. It has only to be added that electricity (used early) and the iodide have been known to be beneficial in cases which have resisted the ordinary methods of treatment.

5, Diseases of the Sympathetic Nerves. -

In this class of diseases indications must also be met as they arise. Thyroid enlargements usually disappear

under the action of iodine externally or internally, provided always that it be used for a lengthy period.

We have already noted how the iodide of potassium is of wonderful value in cases of congestive headache, and any of the ordinary analgesics may be tried in addition.

Althaus (Infl., p. 356.) considers a combination of five grains of quinine and fifteen grains of antipyrin to be a cure for scintillating scotoma, and the galvanic current as effective in Grave's disease.

8, General Neuroses. -

The fact of these so often being of influenzal origin will not demand variation from the accepted forms of treatment; thus, the bromides will still be as effective in post-grippal epilepsy. Tetanus, in addition to the ordinary therapeutic measures, will benefit by the hypodermic injection of the antitoxine of that disease.

Althaus (Infl., p. 356) claims to have markedly shortened cataplexy and trance by the use of the faradic brush.

Arsenic and antipyrin would, doubtless, give satisfactory results in post-grippal Chorea; so also tonics, rest, change of air, and cheerful associates in agorophobia.

(7) Diseases of the Eyes. -

These must be dealt with upon the general lines laid down in the text books.

(8), Diseases of the Ears. -

The same holds good here also. The German army report clearly demonstrates the important fact that irrigation of the nose and ears never failed to give relief, especially in otitis media, if combined with antiseptics and astringents.

(9), Diseases of the Organs of Circulation. -

General principles again! Tonics and stimulants are especially indicated.

Althaus (Infl., p. 457) recommends doses of 1/20 to 1/60 of a grain of digitalin as being of greater service than the tincture, which, however, may be used if preferred;

or, on the other hand, strophanthus, strychnine, and caffeine citrate form valuable cardiac tonics, with or without $\frac{1}{4}$ of a grain of the sulphate of spartein to each dose. The tendency which the caffeine has to increase the arterial tension (this may be contra-indicated) can be controlled by trinitrin which reduces it. It should for this purpose always be given at first in small doses, $\frac{1}{2}$ minim of the 1% liquor for instance.

Spirit of camphor, with syrup, makes an excellent diffusible stimulant; and the ammoniated tincture of valerian, with compound tincture of lavender and the aromatic spirit of ammonia frequently exhibited, has a very pleasing effect in correcting the flagging circulation. This latter is considerably aided by the application of heat to the cardiac region.

10, Diseases of the Respiratory Organs. -

(a), Laryngitis. - This common complication is best combatted by the bronchitis kettle, and the water to be evaporated from it may well have added a teaspoonful of Friar's balsam to the pint: this usually gives a surprising and almost immediate relief.

(b), Bronchitis. - The drugs recommended for this distressing complication are almost without number.

Inhalations of steam, with or without medicaments, from a special kettle or a special kettle, are of the utmost value. Terebene, ammonium chloride, carbolic acid, &c. may be used in that way, and experience has proved the utility of the procedure.

Ammonia, in the form of the chloride or carbonate, may be given in the mixture. The persistent cough may be dealt with by the cannabis indica tincture, inhalations of chloroform, amyl nitrate, and the like. It is, however, a matter of common experience that the ordinary expectorants usually fail to relieve the grippal bronchitis, the dyspnoea, wheezings and cough of which may sometimes be controlled by the bromides or iodides conjointly or separately.

For the tight substernal pain, Packard (Hare's System of Practical Therapeutics, 1901, p. 194.) recommends

a turpentine stupe to the front of the chest every four hours. To encourage expectoration he advises rubbing of the chest with an embrocation composed of equal parts of that drug and the oil of amber. His suggestion that the risk of subsequent bronchopneumonia may be averted by wearing a cotton jacket or thick under-shirt, is a reasonable one, especially at the extremes of life.

Relief of the nasal obstruction is especially to be attempted as obviating the risk of pulmonary complications from the consequent mouth-breathing. It can usually be effected by a simple cleansing spray or medicated snuff. Where the nasal mucous membrane is much swollen, and hyperaemic, cocaine may be added to the powder to be used a snuff, and whilst it causes immediate relief from pain, it should be remembered that it may ultimately make matters worse by means of its congestive action, in which case local anaemia may be induced by some astringent swab, a variety of which are given in the special works upon rhinology.

(c), Broncho-pneumonia.— This most serious and fatal complication of influenza as a rule calls for prompt and vigorous treatment. It is a common malady both during the acute stage of the influenzal attack as well as when the convalescence is well established. It being such a debilitating disease the value of a stimulating procedure should not be lost sight of, and some preparation, therefore, of alcohol - champagne by preference - is called for. In giving the cardiac tonics, such as digitalis and strychnine for this condition their vaso-constrictor action must be remembered, and that disadvantage overcome by combining them with with a vasp-dilator, such as nitroglycerine, in small doses.

Strychnine is especially indicated as being one of the best of all the nervous and respiratory stimulants; but the danger of using it early in the acute stage of the pneumonic affection is the same as in the case of alcohol: that is, the patient is given a false feeling of strength. This is apt to cause him either to rebel against enforced rest, or actually to disobey instructions;

and it is as well in this connection to warn the patient of the very serious nature of his illness. During the convalescent stage, strychnine is the drug par excellence, aided by good and stimulating diet, and gentle exercise.

Oxygen gas inhalation is now believed to be a most valuable remedial agent in the treatment of influenza pneumonia (Couper Cripps: Oxygen and Strychnine in Respiratory Troubles, Brit. Med. Jour., Feb. 27, 1892.), but, unless properly handles, it fails to be of use, and is provocative of much annoyance to the patient. The air must be, as it were, supersaturated with oxygen, the best plan being to hold the nozzle near the patient's mouth, and just near enough for the gas to be freely inhaled. Marked relief, however, of the distress, with disappearance of the cyanosis, and a feeling of comparative comfort, can be given the patient by simply directing the nozzle of the inhaling tube towards the patient's mouth from the level of his ear. Clement Penrose (Cited by Packard, Hare's System of Practical Therapeutics, vol. ii, p. 196, 1901.) advocates a method of administering oxygen which is an improvement of that hitherto used, and has for its object the rendering of the current of the gas less perceptible and annoying to the patient. It consists of the use of the use of warm water in the reservoir attached to the oxygen cylinder. A funnel in the inhaling tube allows of the diffusion of the gas through the air in the immediate vicinity of the patient's mouth and nose, without his having cause to resent the forcible and annoying current of the gas present when the apparatus is used in the older way.

Gordon (A case of Influenza treated by the External Application of Cold, Lancet, Feb. 27, 1892¹). believes in the adoption of the method of cold sponging even when there is no evidence of hyperpyrexia.

Huchard (Treatment of Grippal Pneumonia, Sem. Méd., Feb. 13, 1892.) strongly recommends crystalline digitaline, of which he gives a single dose of 1/20 grain in the day: 40-50 minims of a 1 in 1,000 solution. The next day

he withholds it, and treats cardiac failure, if any, by means of hypodermic ether, caffeine, or strychnine. The digitaline is given at the end of the week in smaller doses of 20 or 30 minims of the solution. He also takes occasion to recommend the use of an antiseptic mouth wash to prevent secondary infection of the air passages; and, for the same purpose, in connection with the intestinal canal, administers capsules of benzo-naphthol four or five times a day.

The tincture of digitalis acts somewhat more slowly than that of strophanthus, but it is tolerated to a surprising degree in acute asthenic pneumonia, for which it may be given freely, and is said by many to be almost a specific for that ailment.

During the convalescence, the tincture of kola and coca constitute valuable tonics.

11, Diseases of the Digestive and Urinary Systems; and of the Skin and Joints. -

These must be dealt with on the approved lines, in accordance with special indication .

The gastro-intestinal catarrh may usually be combatted by the early exhibition of aperient mercury, followed by bismuth with bicarbonate of soda.

Vomiting, when troublesome, usually yields to hydrocyanic acid and morphine.

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