Measles

A thesis on Measles based on my experience in sixty cases seen in October, November and December 1894 in Leeds by

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Measles.

Synonyms.
By various writers in different countries it is termed Morbilli, Rubella, Roupole, Masem, Rosalia, Fleckem.

One form of the disease in Scotland is commonly termed the Nirles.

There seems however to be some diversity of opinion regarding the term Nirles. D. Gregory describes Nirles as Rubella Varioioides where vesicles appear on the arms and trunk.

(D. Gregory, Eruptive Fevers, Page 167).

D. Hebra regards Nirles, the Nirles of Alibert, as a form of the disease where the rash is essentially papular and
not the vesicular form.

(D. Helix. Diseases of the Skin
Vol. I Page 165)

Sauvages first named it Rubeola and this term was adopted by Cullen and Willan. Unfortunately by German writers, Rubeola signifies not measles, but Rothelms or German Measles.

The term Morbilli which had previously been used in a wide sense, embracing any of the exanthemata as it literally meant the little plague was restricted to Measles by Sydenham and it is now most frequently employed by British writers.

Measles is an acute infectious disorder, characterised by coryza and fever in the prodromal stage, followed by a peculiar papular eruption on the face and then body generally.
and afterwards by brainy desquamation and conferring immunity on most of its sufferers against subsequent attacks. Originally it was regarded as a mild form of Smallpox and was described by Rhazes as generically the same disease but with specific differences which he endeavoured to point out.

Hoffman although making a distinction still described it in one section with Smallpox (Hoffman: Practice of Medicine Vol. II Page 501).

History.

Some authorities think that Measles was known to the Ancients amongst these belivers are Semenst, Welsch, Manall, Oderis and many others. Dr. Bateeman and Willan tried hard to prove it. Oderis has even
contended that the plague of Athens described by Thucydides was an epidemic of this disease. Schmer supposed that the epidemic which prevailed in Thrygia, Cappadocia and Cilicia in A.D. 455, described by Eusebius was Measles in a severe form but as the description given was very imperfect it leaves it as a supposition only. Gruner and Stengel have shown that the earliest accounts we have of the disease refer it to about the period at which Smallpox was conveyed from Arabia to Egypt and thence into Europe.

The earliest reliable account is by Rhazes under the name of Ihasbah and he quotes from Abiron who lived in 622 at Alexandria and even Abiron did not speak of Measles as a new or unusual disease.
Chamers believed that the disease was known to Galen more than 600 years before his own time but this belief was founded on an incorrect translation of Galen's works into the Arabic language. (D. Miller, Cutaneous Diseases, p. 28)

Friend and Mead thought the disease to be of comparatively modern origin but our best authorities are agreed in the belief that Measles began to spread about the same time as Smallpox and had its origin on the shores of the Red Sea, the coasts of Arabia and Abyssinia probably about the 5th or 6th century. (D. Gregor, Eruphie Fever, 1697)

It was distinguished from Smallpox by Avicevina and Mesma, but more clearly by Foresters in 1597 from his experience at Brabant in 1580.
Schenck in 1600, Riverius in 1655. The illustrious Sydenham in 1676. Hoffman in 1718.
Dr. Withering and Wellan in 1793 did much to improve our knowledge of Measles apart from Scarlet Fever and Smallpox but even as late as 1779 Dr. Withering speaks of Measles as being very near allied to Scarletina.
But after the days of Arveonna and the others who wrote in the same mind, Drenebroack (Sydenham's great contemporary) in 1687 maintained the identity of Measles with Smallpox.
(Dr. Gregory, Practice of Medicine, Page 145)
Dr. Morton contended that Measles and Scarletina were the same disease in as much as they differed no more than distinct and confluent Smallpox.
He tried to banish the very name of Fæculina from medical language but few followed him.
(Extract from Willan, Cutaneous Diseases, Page 241)

Sir William Watson adopted Dr. Morton's opinion and nomenclature in 1768. In 1763 his technical terms seem to have been different and later on he gave up the use of Morton's nomenclature.

Measles is essentially a disease of childhood but sucklings though they have no absolute immunity yet undoubtedly have diminished susceptibility.

(Drummond, Cyclopedia of Practice of Medicine Vol. II p. 49)

Infants at the breast are not so susceptible as children more advanced.

(Dr. Willan, Cutaneous Diseases, note, Page 215).
Dr. Underwood also refers to the immunity of early infancy, remarking that he has known, in more than one instance, a twin escape the disease whilst the other child suffered and both were nursed in the same apartment and suckled by the same mother.


Measles may, however, attack adults of any age. Dr. Wellan says the disease may take place in grown persons of an irritable constitution.

(Reprinted from Dr. Wellan, Cures, Diseases 2:21.)

**Symptoms**

**Incubation**

The period between the entrance of the disease into the system and the appearance of definite symptoms. This period varies from 3 days to 3 weeks. Usually
Between 5 and 10 days, Rülicke and Chomel thought the rash appeared about a week after exposure to infection. Dr. Home in his inoculation cases found an incubation period of 7 days, but we cannot decide the length of incubation by inoculation experiments alone. We know that the incubation of Smallpox is about 13 days and the rash appears about the 16th or 17th day from infection whereas by inoculation the rash appears on the 13th or 14th day.

(D.R. Roberts. Practice of Medicine 1859)
Dr. Bonchout found in Hospital Neckar 12 to 30 days.
(Mal des Enfants Nouveaux)
D. Janné of Copenhagen from large experience determined 13 to 14 days.
(Edinburgh Monthly Journal of Medicine June 1851)
As a general rule throughout
This stage of the disease in children there are no symptoms but in adults we may find slight feverishness, depression and catarh. Dr. Gregory refers to marked languor occasionally present all through the incubation. (Dr. Gregory. Euphobia Ferves Page 99).

**Invasion.**

This stage is ushered in with a feeling of weariness, chilliness increasing to rigor, fever, dry skin, quick pulse and thirst. The pulse is increased in frequency and volume but rarely attains the same rapidity as in Scarlet Fever and it always loses in force. Occasionally there is sleepiness leading to almost continuous sleep, the child only waking to have a drink and its most urgent wants supplied. This is such a frequent symptom as to lead to the recognition of what
is termed "Sleep Paralysis" (D. Starr, Diseases of Children). The face is flushed, eyes injected, suffused, sensitive to light and accompanied by free lacrimation. There is oedema of the eyelids, pain over the frontal sinuses, nasal as well as conjunctival congestion and irritation. The nasal passages are stuffed up from the swollen mucous membrane being puffed up so as to come into opposition. Sometimes the upper lip is greatly swollen. There is frequent sneezing, may be epistaxis but free secretion at first thin and aerial afterwards of a mucopurulent character is always present. There usually appears about this time a hoarse hacking cough occurring in fits. The temperature rises more or less gradually to 102°-105° according
So the severity of the attack, not reaching its maximum till the rash appears and usually not until the 6th day, namely when the rash is at its height, after which it quickly subsides if all is well. M. Blache and Griesen have described a rose colour of the vault of the palate quite different from that seen in Scarlet Fever.

(Dictionnaire de Médecine, t. 27, p. 638)

Vomiting and vomiting may occur but not with the frequency seen in Scarlet Fever. Anaemia is constant.

The eyelids are frequently greatly swollen, even to closure of the eyes. and glandular enlargement may be observed, the submaxillary glands most frequently.

(D. Copland, Dictionary of Medicine
Vol. II Page 813)

The urine is scanty of a deep red colour, acid with increased urea and chlorides, and a constant
excess of urates. Occasionally albumen is seen also blood in small quantity.
Albuminuria is not of the importance that we associate it with in Scarlet Fever and according to Parke it is no unfavourable sign as in the Feith epidemic of 1854, the recoveries were most speedy when the albuminuria was the most marked.

(Parkers on the Urine, page 262)

Out of 60 cases I saw from July to December 1894 I found several with Albuminuria but there never seemed to be any untoward effects.

Nervous symptoms occasionally supervene. Pulmonary dyspnoea and severe vomiting and purging. Dr Ringer considers that if the vomiting is severe and persistent it indicates a severe attack of the disease.

(Reynolds System of Medicine Vol. I. Page 412)
This period usually lasts 3 or 4 days but may vary from 2 to 8 days.

Mr. Quaker in a letter from Jamaica respecting an epidemic of measles there, states that a very large number of negroes were affected and though the epidemic his chief diagnostic during this stage and before the typical rash appeared, was the appearance of white specks on the gums which gradually increased in size during the progress of the disease. (Letters from the West Indies 2.115)

Since that time many others have described the same appearance, there being a difference of opinion as to whether it is the rash appearing on the mucous membranes or something independent of it. D. Starr points out that the rash shows itself on the soft palate 24 to 48 hours before the skin. (D. Starr, Diseases of Children 2.149)
An erythematous eruption occasionally precedes the ordinary rash.

(F. C. R. Practice of Medicine, page 1865)

The temperature at this time before the rash appears is often 101° or 102° and then is most variable. The course of the temperature of the next day or two cannot be predicted with any degree of certainty as it may fall to normal, rise or persist unaltered; in fact often has led me to think that no disease is impending by its recession and the child feeling better.

(D. Fagge. Practice of Medicine, Vol. I, page 318)

The temperature varies a good deal in different cases according to severity of the disease and as in private practice where many cases are only seen late, it is impossible to get full charts in all cases, so I give a chart taken from Dr. Stark's Diseases of Children, p. 145 which I believe to be a very fair type of the ordinary course as it agrees in general with my own observations.
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(Elucid. Practice of Medicine Page 1065)

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The evening exacerbations are very distinct.

**Eruptive Stage**

The eruption occurs in 3 crops. Usually on the 4th day of the disease it appears on the forehead near the roots of the hair first (Rupiez) chin, behind the ears and on the face generally.

D. Starr is the only authority I can find who refers particularly to the early eruption appearing behind the ears.

(D. Starr. Diseases of Children, p. 144)

I myself noticed it as a first indication of the rash in several instances.

On the morning of the 5th day it is seen on the neck and breast proceeding to the rest of the trunk and by 12 hours later it appears on the extremities.


It first has the appearance of minc
Speckles on the face, spreading to
fleecy and then appear to form
in slightly raised papillae soft and
velvety with none of the gritty short
feeling so diagnostic of smallpox
papules. They gradually form into
clusters or irregular crescents or
semicircles a fact first pointed
out by D. Waddell. Cutaneous Dises
page 218 and now accepted by most
authorities and D. Craigie considers
this crescentic appearance a diag-
nostic mark of great certainty.
The eruption is distinctly
elevated above the skin especially
on the face which is altogether
swollen and puffy. Occasionally
on the face the patches of eruption
coalesce so as to leave no healthy
skin between. It disappears on
pressure except in some cases
where it disappears only with difficulty
so there is infiltrated haematin
deposited and this leaves a brown
discoloration. (Fleit. Practice of Mediinc. 3. 1066)
Occasionally miliary vesicles appear and when they do they are most seen on the arms, neck or breast. The submental and popliteal regions are usually the least affected by the rash. (Ogilvie).

Even in severe cases however we can usually find normal skin between the crescents.

The general belief is that the rash does actually affect the mucous membranes as it does the skin. It may be late in appearing but can usually be seen on the buccal mucous membrane and on the gums and fauces, though the throat is never so severely affected as in Scarlet Fever. Cases are on record where ulceration has taken place on the fauces to more or less severe extent. Cases of this kind are referred to by Dr. Clark.

(Dr. Clark. Observations on Fevers, p. 211)

Dr. Hebra denies that the mucous membranes are affected like the
Skin, he says that secretion is increased from congestion and that only.
(Dr. Hébra, Diseases of the Skin, Vol. I, p. 161)

There is occasionally a swelling of the tonsils with deafness due to occlusion of the Eustachian tubes. (Dr. Fowler, Diet. of Medicine, p. 499)

I have noticed one instance of this kind where the deafness was only relieved late in convalescence but recovered completely. There was no tenderness over the parotid nor any sign of ear disease.

Whilst the rash is on Mr. Heim has described a peculiar smell and he compares it to recent goose guillen. Dr. Home compares it to that of Smallpox. Niemeyer thinks it is highly suggestive of a freshly roasted goose. Heyfelder thinks it is stronger in the morning than evening. Churchill has noted no difference. Rollins and Basson have never noticed it at all.
I have several times been struck with it but I have noticed that it has always been most noticeable amongst the poorer classes where cleanliness is only regarded as of secondary importance or where there are many patients in one room. I think it is due to excretions of the sweat glands and is analogous to the acid sweat of Rheumatic Fever and the smell from the sweat of Epidemic Influenza which I think from recent personal experience is very suggestive of stale excreta.

Dr. Ringer refers to a peculiar odour of both the urine and breath and this he considers to occur in children in all acute febrile diseases and in children only.

(Reynold's System of Medicine Vol II)

On the 6th or 7th day the rash is at its height and begins to fade first on the face, following the order of its appearance.

Itching is variable, in some cases
very distressing.

The general symptoms are severe on the appearance of the rash if not worse than before, thus forming a strong diagnostic mark from SLEET (Watson). But Villan and Gycnene are both agreed that nausea and vomiting seldom continue beyond the 4th day.

(D. Villan. Cutaneous Diseases p. 223)

There is great thirst, high fever and intensely hot skin, furred tongue and enlarged red papillary. The catarrh of the mucous membranes still persists, the voice is still rough and hoarse, the dyspnoea continues and probably bronchitic rales may be heard in the chest. The face frequently becomes of an intense red colour.

The rash is usually at its height on the 6th day and then gradually disappears leaving in some parts yellowish spots, stigma or maculae noticed by Guersant and
Blanche also Ryan and Fournier after the rash has reached its full extent the temperature usually becomes normal again; in 24 to 48 hours, if delayed there is probably some untoward complication.
(Dr. Austin. Practice of Medicine, 1903)

Desquamation
About the 7th or 8th day
desquamation commences. It is of a fine branny nature and sometimes only takes place where the rash was most severe. It is best noticed by brushing a black coat sleeve against it. This lasts 3 or 4 days.
During this time there is a gradual return to health, the pulse becomes quiet, the skin cool, tongue cleaner and thirst less. Appetite begins to return, voice becomes more natural, cough softer and looser.
Deafness occasionally appears about this time and is regarded by many authorities as a crisis, clearing away
The drugs of the disease.
D. Roberts points out that occasionally this diarrhoea becomes chronic.
(D. Roberts. Handbook of Medicine p. 176)

After this if no complications arise there is a rapid return to health.

Simple Measles as it is described is a very common and rarely fatal disease. When death occurs it is due to:

1. Special modification or severity of type.
2. Lowered vitality or defective constitution of the child previous to infection.
   or
3. Some complication.

Modifications of Simple Measles.

Cataract. This may vary in severity. D. Willan describes a form where there is no cataract, ophthalmia nor fever under the name "Rubeola sine Catarhæ."  
He also quotes Dr. Heberden as describing the disease without naming it. It does not remove susceptibility to febrile measles as is absolutely proved by the case of a family of 4 children described by Dr. Mannse1 and Evason where they all had febrile measles six weeks after "Rubeola sine Catarrho."

(Drs. Mannse1 and Evason, Practical Treatise on Diseases of Children, 1st Ed., p. 381.)

Dr. William himself states that persons receiving the smallpox in this form are peculiarly liable to an attack of measles quoted from William by Dr. Gregory, Empire Fever N. 102.

Dr. Meigs and Peiper believe this to be an example of Rubeola.

(Drs. Meigs and Peiper, Diseases of Children.

Dr. Starr thinks that it should really be classed under Rubella.

(Dr. Starr, Diseases of Children, p. 136)

D. Barlowe also doubts the connection of this form with the Morbilli as instead of concurring
Community it seems rather to choose those as victims who have already had the true form.

(D. Barlowe, Practice of Medicine, p. 677)

D. Hamilton Cooks in "Rubeola sericata" of Willan as an absolute contradiction of terms.

(D. Hamilton, Hints on the Principal Diseases of Childhood, page 152).

Rash.

The rash permits of many modifications of character and seat. Thus we may have a rash over the whole of the body severe or slight. It may be limited to almost any part as in the "Morbillous Fever" of Systenham, 1674. It was described as principally on the neck and shoulders.

D. Willan regarded this as a form of Epidemic Catarh.

(D. Willan, Cutaneous Diseases, p. 239).

In an epidemic at the College de Vendome in 1826 M. Gendrin saw it was confined to the face.
In a case mentioned in Rust's Journal the eruption occupied one half of the body only.

(Dull, le Fournac 1880 Vol. 26, p. 28)

Dr. Hebra states that the rash may appear first in any part that has been compressed by tight bandages or articles of clothing or on a side that has been lain on.

In the case of spinal disease it may be entirely absent from the paralyzed extremities.

(Dr. Hebra, Diseases of the Skin Vol. 17, p. 163)

A form has been described where the rash was absent altogether, under the name of "Rubela sine Eruption" noticed by Morton, Vogel, Eberle and Richter.

It would be very interesting to try inoculation from "Rubela sine Caparcho" and "Rubela sine Incubatio" and see if we could develop the true disease.

Again the rash may vary in color. It is usually vivid or deep red but
in sickly children, frequently it is pale and dirty looking. It may be a dark livid color as in the Rubeda Negria of Willan where it is like purpurea, with fine ecchymosis. Another dark shade has been described where the spots are brown or nearly black and Rayer regards this haemorrhagic form as different from Willan's Rubeda Negria.

In the case of the true negro the eruption appears as yellowish spots slightly elevated and giving a sensation of roughness. As the intermediate races between the negro and the white man become paler the rash changes gradually from the yellow to reddish brown in the Malatto till we get the usual description in white people.

(Dr. Flint, Practice of Medicine, 1869)

Recession of the rash after its appearance occasionally occurs and is regarded as a very dangerous occurrence. Willan states that it
occasions violent delirium, restlessness, difficulty of breathing, pain in the bowels, diarrhea, etc., and always greatly endangers the patient's life.
(Dr. Willan. Cutaneous Diseases p. 227)
Hayes also expresses the same sentiments under caput 14.
(Quoted by Dr. Willan).

Dr. Marshall Hall points out 4 modifications which he regards as occasional events.
(Dr. Hall. Practice of Medicine p. 145)

I. Recurrence of the Rash.
The rash may disappear after taking the ordinary course and then come out again. This is also referred to by Dr. John Gregory of Edinburgh. (Dr. Gregory. Elements of Practice of Physic p. 85)

Dr. Hebra thinks it to be a form of Roseola. (Diseases of Skin Vol. 5 p. 164)

II. Recurrence of Rubella.
Dr. Hall thinks that the disease may run its usual course and then begin all over again.
Rosenstein, though absolutely denying proper attacks of the disease, thinks that the maxima of the disease may be retained in swollen glands and cause a new eruption.

(Rosenstein, Diseases of Children, translated by Spence, 1744)

Dr. Home records such a case.

(Dr. Home. Medical facts and Inquiries, p. 281)

III. Intermixture of Another Disease.

Pertussis is mentioned as being mixed with in its course by superinfection of measles. It has been recorded to have stopped till measles ran its course and then the cough has appeared again.

IV. Conjunction of Another Disease.

Variolae and Measles have occasionally been reported as existing together though many great authorities doubt it. Professor Berquin gives an instance of Variola and Measles together.

(Variolae College Med. 1765, p. 266)

Rosenstein quotes this but adds that he himself never met with it.

D. Henoch mentions conjunction with Varreilla. (D. Henoch. Dis. of Children, p. 255)
Enteric fever has been found coexisting with measles by Barlow & Billet 1853 II p. 706. lamp. 1839 p. 245 and Jenner. Lancet 1866 I 619.

Second attacks of the time measles though very much more rare than the public thinks yet are looked upon as an actual occurrence by the majority of medical men of today. Churchill records a sure case. Dr. Balée records several. Burrows, Robedien, Home and many others have described it.

Dr. Starr remarks that next to Typhoid fever measles is more apt to return than any of the other exanthemata. (Starr, Diseases of Children p. 150).

Dr. Enstice Smith makes the same statement. (Smith's Diseases of Children p. 19).

Still on the other hand Willan and Rosenstein emphatically declare that they do not believe second attacks ever occur (quoted by Allen, Fruit of Fruit, Vol. I 352).

Willan states that after an attention
To eruptions complaints for more than 20 years he has never met with two attacks of febrile rubella in the same person.

(Dr. Wellin, Cutaneous Diseases p. 235.)

Rosenstein states that in a practice of 44 years he never met with a single case of second attack.

(Rosenstein Diseases of Children Translated by

Spaunow p. 144.)

Many physicians divide measles simply according to severity into 2 grades namely: Morbilli Minories and Morbilli Graviores, but the characters in many cases are so distinctly marked that we may well divide them into 3.

I. Inflammatory.
II. Congestive.
III. Typhoid.

It is an old division but I think expresses very well the actual types as we meet with them.

I. Inflammatory.

This is the type that is simply an exaggerated form of simple measles.
Every symptom may be exaggerated, fever higher, catalepsy more severe. This form usually takes place in well nourished healthy children and is bog as no complications supervene all may go well but Coulmis, Croup, Pneumonia and Gastro-enteritis are to be looked for.

II Congestive Type.
The vitality is low and reaching zero. The face is pale or bluish, features sunken and anxious, pulse weak, breathing oppressed and circulation weak. Often the eruption is defective. Children of weak constitution are most liable to this form.

Dr. MacKenloch thinks this is no doubt one form of "Pulvred Measles" as described by Morton, Hursham and Watson.

(Dr. MacKenloch, Practice of Physiology 192)

III Typhoid Type.
There is great prostration, profuse sweats, diarrhoea and haemorrhage. This form prevailed in Edinburgh...
from September to December 1816. It was so accurately described by Sir William Watson in an epidemic in 1769 that for long it was known as Watson's Measles. I give the description as given by Dr. Gregory. (Epidemics, p. 109.)

"The eruptive fever is severe and attended with unusual symptoms. The fever is typhoid and not inflammatory. The eruption appears too early or too late. It perhaps recedes after having itself and partially reappears. The stomach is irritable, vomiting is both severe and protracted. There is delirium with wildness of the eye or coma. The belly is tender; there is frequenting of unhealthy stools; the extremities are cold; the pulse small and wavery. On the surface appear petechiae or ecchymosed patches of eruption. The faces assume a livid or dusky red color; blood passes by stool; there is much oppression at the malarial, and abundant mucous serous discharge"
from the chest, indicating the congested condition of the lungs and their mucous membrane. In these almost helpless circumstances children may die in 48 or 60 hours asphyxiated by the condition of the air passages, others die of coma or convulsions, some are worn out more slowly by chorea and bloody stools.

Complications and Sequelae

In the case of Measles as observed by Dr. Keppel (Practise of Medicine Vol. 1 p. 573), it is very difficult or impossible to properly disassociate the complications and sequelae as the complications are continued and thus themselves become sequelae. I therefore describe them together. The Complications of Measles are the most important part of the disease and measles robbed of its complications would be of little importance indeed. Complications frequently appear where there is a predisposition. "Thus some find to use the language
of Sydenham, that the constitution of the atmosphere for the time being gives a predisposition to the production of certain diseases at particular seasons, so does the febrile form of chronic disorders which has been produced in a child by improper diet and management predispose it to be affected by one kind of acute disease rather than by any other. (D. Haden: Practical Observations on Diseases of Children, edited by Alcock, page 38).

Or as Celsius puts it, the brunt of the complicating disease falls on "a weak part."

These distinctions follow from the fact pointed out by Dr. Armstrong 100 years ago that the various forms of disease in a number of persons the same causes of the same disease subjected to the same circumstances arise from the modifying influence of this weak part.

Dr. Hall draws attention to the fact that Measles is characterized by a distinction to Adhesive Inflammation (Part. of Medicine). Almost all the sequelae of Measles
have an inflammatory character.
(Dr. Gregory Practice of Medicine page 146)
The Chief Complications are:

1. Convulsions.
2. Pharyngitis and Sore Throat.
3. Broncho Pneumonia etc.
4. Pneumy.
5. Mumps.
6. Gastro Enteritis, Colitis etc.
7. Ophthalmia.
8. Otitis.
9. Haemorrhage.
10. Syphilis.
11. Tubercles.
13. Carcinum Crisnel Vulvae.
15. Pertussis.

1. Convulsions may occur as an
initiatory symptom of insanity
and not occur. In two cases I
have seen this but in each there
was a history of previous tendency
To Convulsions without regard to Measles. Many authorities think that Convulsions during Infection are favourable to the course of the disease but Dr. Willan thinks otherwise. (Dr. Willan, Cutaneous Diseases, p. 216). Occasionally they may be severe and prolonged and here after death we can generally find traces of cerebral or meningeal congestion. Dr. Warham says that Convulsions occurring late in the disease are almost invariably fatal. (Keating, Cyclopaedia of Diseases of Children, Vol. I, p. 681).

2. Pharyngitis and Laryngitis.

The catarrhal affection of the mucous membranes in the mouth occasionally spreads so as to lead to these complications but the Pharynx is not usually so severely affected as in Scarlatina. The Larynx has sometimes its mucous membrane reddened, ulcerated, softened and covered with false membranes consisting due crop. This generally occurs on the 3rd or 4th day. It does not seem
To be a very fatal complication if the primary measles is not taken in a very severe form. (Guerant and Black).

When it comes on at a later date with fatal results, there are usually very severe lesions of the larynx.

Rosenstein refers to a form of gangrene of the throat which caused great mortality in an epidemic in Vienna in 1732. (Rosenstein, Diseases of Children. Translated by D. Scharnagl, p. 143)

Wunderlich also mentions this form of gangrene.

3. Broncho-Pneumonia.

Inflammation of the bronchial tubes and lungs is the most important and most frequent complication of measles. Bronchitis and Lobar Pneumonia occur much less frequently than Lobular or Broncho-Pneumonia. Guerant and Black found: Bronchitis 24, Acute Pneumonia 7. Catarrhal Pneumonia 58.

It may occur at any time during the measles but is most common during the early febrile period. When it occurs in
The early eruptive period it frequently causes the rash to be retarded in its appearance, or it may retrocede with great aggravation of the general symptoms.

(Dr. Eustace Smith, Dis of Children, p. 26)

When it occurs after the disappearance of the Measles when the child is in a very debilitated condition it is often of a very serious character.

Dr. Gregory thus graphically describes its nature:

"It is a slow, creeping insidious form of inflammation which too often thins the practitioner off his guard. No positive complaint is made. The child droops and appears exhausted. Imagining the disorder has weakened his patient the practitioner directs some mild tonic. Meanwhile pneumonia engorges expimor, the lungs become more and more congested and at length solidified. Convulsive fits now take place, alarm is taken and leeches are applied but the mischief is irreparable. Dyspnoea increases, the child becomes drowsy and the first cold..."
The pulse sinks, florid effusion now takes place from the bronchial membrane. Another and another fit succeeds. Rattles are heard in the throat and the child dies!"  
(Dr. Gregory. Empiric Fevers. Page 166).

The symptoms generally are those of the ordinary pulmonary disease: cough, dyspnoea, moist bronchitis or pneumatic rales, more or less unlimited bronchial respiration, vocal resonance and fremitus increased, slight dullness on percussion usually with some increase of temperature. There is a danger of hurriedly taking the symptoms to be of the nature of the ordinary catarrhal symptoms without looking for the physical signs but if the chest is carefully examined at regular intervals this possible danger is avoided.  

When Tubar Pneumonia occurs there is danger of overlooking it as the dyspnoea is markedly less in this form than in the Catarrhal. (D. Warner. Reading's Cyclopaedia of Dis. of Children. Vol. I. P. 680).
In one case of my own there was no dyspnoea to speak of, but I examined the chest as I was not satisfied with the apathetic look and behaviour of the child and I found the whole of the lower lobe of the right lung perfectly dull.

Dr. Gregory states that 3/10 of deaths from measles occur from Pneumonia. My own experience in 60 cases is that the only 4 deaths I had were all due to Pneumonia.

They younger the child the more it seems predisposed to Pneumonia in one form or another except under 12 months and here Capillary Bronchitis is more common. Bronchitis is progressively more frequent as age advances.

Occasionally Pneumonia seems to be the characteristic of an epidemic. Dr. Dewees says that in an epidemic in the spring of 1785 or 1786 almost every case had Pneumonia with greater or less violence. (Dr. Dewees Treatise of Treatment of Children Page 528).
Broncho Pneumonia frequently never wholly cleans up but resolves into Phthisis. Dr. Tanner refers to Pulmonary Abscess as a common occurrence.

(Dr. Tanner. Practice of Medicine Part I p. 282)

Dr. Roberts refers to Collapse of the Lung.

(Dr. Roberts. Handbook of Medicine p. 176)

In an epidemic at Kiel in 1860 Collapse was very frequent.

Effusions may take place into the pleural cavity and also into the pericardium without any previous sign of inflammatory action. Hydrocephalus and ascites also occasionally.

(Dr. Copland. Dictionary of Medicine Vol II p. 818)

Gangrene of the lung is referred to by many of the older writers and seems to have been a great cause of the winter and great mortality of Measles in times long past.

4. Hemmings.

This is mentioned by many but Dr. Geo. Gregory says he does not remember ever to have seen a pure case.

(Dr. Gregory. Emphatic Fever p. 107)
5. **Mucous Etc.**

Various forms of Stomatitis, ulcerated sore mouth etc. are occasionally secondary affections in the course of Measles but may be more dependent on gastrointestinal disorders, that is they may be common complications or the Stomatitis may be secondary to the gastrointestinal complication. This requires nothing in the treatment.

They are most frequent where the children are ill-nourished or where cleanliness is neglected.

6. **Gastro Enteritis, Colitis etc.**

This important complication was just brought to notice by Stoll. Many of the older authorities give a special type of Measles from the occurrence of this complication. Disorders of the stomach and bowels is so generally present that one might almost take it as a part of the ordinary symptoms of Measles so long as it is not in too marked a form. We get the catalethal process
in the mouth and it would only appear natural to have a continuance of it to some extent down the course of the alimentary canal.

Dr. Copland observes:

"It is chiefly marked by accumulation of fumes in the stomach and bowels; by loaded tongue; pain and tenderness at the epigastrium; hypochondriac bowels; by morbid bilious and offensive alvine evacuations, by the great severity of the cough; by depression of the energies of the frame; the slower and less abundant eruption on the skin; by weakness and frequency of the pulse; and by severe pains in the lower limbs and forehead. It sometimes characterizes summer and autumnal epidemics, particularly during and soon after warm and moist seasons, and it occasionally occurs sporadically in weak children during the periods of 1st and 2nd dentition; in the imperfectly nourished and in those who have had their bowels long neglected. (Dr. Copland, Diet. of Pract. Med. Part IX, p. 815)"
Improper food and impure air seem to have a large responsibility in this complication.

Coposition of the Liver is very apt to occur with pain on the right side whilst lying on the left.

(D. Armstrong, Illustration of Measles, p. 146)

Rupture of the Bowel sometimes occurs.

(Ashley and Wright, Diseases of Children, p. 231)

7. Ophthalmia.

The regular injection and suffusion of the conjunctiva with free secretion of the mucous membrane and lacrimal gland usually subsides spontaneously leaving only a slight hyperaesthesia and photophobia for a few days, but in some cases from the 6th to 12th day or after we may have simple or even persistent ophthalmia which may terminate in loss of sight. However usually it is the conjunctiva of the lids that is chiefly affected and it can soon be cured by proper treatment. It often depends upon depraved or cachectic conditions.
8. **Otitis** occasionally appears either confined to the external meatus or involving deeper structures. Pain, deafness, sensitivity to sound and pain on pressure are generally present. It is most common late on in the course of Measles and probably cold is the most common cause of all events it is the cause usually ascribed from our want of a better knowledge of its etiology. It is advisable immediately we notice it which is usually only when the discharge appears to give it immediate attention and careful treatment and not ignore it as is sometimes done.

Dr. Willan looks on this affection as a safety valve and that in consequence of it, other severe affections are mitigated. (Dr. Willan, Cutaneous Diseases, p. 227).

9. **Haemorrhages.** These may occur with rash like an eczematosis but it may be in the internal organs as the intestines, kidneys, bladder, gums or nose. Haematuria and Epistaxis are rather
frequent. It points chiefly to
debility of the circulatory system
and calls for purgative medicine.
Squamous may be very severe and
exhausting.

(3) Ninale Smith. Diseases of Children
p. 25)

It may be the result of lowering
of the vitality in the skin that we
often get herpes, eczema, pustu,
and other like affections following
measles. "Purulent eruptions on
the head and serous ulcerations behind
the ears also frequently occur."
Amongst the occasional consequences
are herpes, boils on different parts
of the body and anasarca swellings
(Eberle on Diseases of Children p. 435).
Some authorities think that when
these cutaneous sequelae appear they
relieve the internal organs by
metastasis.

D. Wellan refers to small hard
fomous, like boils sometimes of a
livid colour afterwards suppurring
with great pain and a sanious discharge, they occur mostly on the back, loins and lower extremities.

In children there is an analogous eruption of enflamed pustules.

(Dr. Willan. Cutaneous Diseases, p. 227)

Dr. Willan later on p. 227 remarks that he believes these eruptions are beneficial.


11. Tubercles.

In leukophaeous children a rapid development of tubercular deposit frequently dates from an attack of measles. It may be in glandular enlargement, mesenteric disease or Phthisis Pulmonalis.

(Dr. Stokes states that more cases of tubercular Phthisis come under his notice who date their first symptom from an attack of Measles than from any of the other exanthemata.

(Dr. Hebra speaks of Acute Tuberculosis
(Miliary Tubercle) appearing very common as Acute Hydrocephalus.
(See Hela's Diseases of the Skin, Vol. I. p. 175)
In an epidemic in Vienna in 1853 it occurred with great frequency.
Dr. Payne in his General Pathology p. 430 remarks that Measles not
unfrequently predisposes to tuberculosis.
This may be so but I am inclined to regard Measles more as the
exciting than the predisposing cause.
This occasionally occurs but
without anything like the frequency seen
after scarlatina. The puffiness of the face, so frequently noticed
after the rash has subsided is not
of any serious nature and soon passes
off. Albuminuria is occasionally
present and Bright's Disease
very rarely developed.
13. Cancrum Oris vel Tandenti.
This scarcely ever occurs except in
Foundling Hospitals and Poorhouses
where children are crowded together
with vitiated atmosphere and is now little known owing to the
hygienic improvements of the present century. The rectum is occasionally
affected.

Most authorities consider that
Cancerous growths are more frequent following
Measles than any of the other
exanthemata. Eichsen regards it in
this light.

(Eichsen. Surgery 9th Ed. Vol I p.924)

D. Wellan however denies this
and says he has never seen a case
following Measles, and he thinks
it is more common after Measles.

(D. Wellan. Cutaneous Diseases p.225)

14. Marasmus

Occasionally ulcers occur at the
angles of the mouth, mesenteric
glands enlarge, tongue first is
red then aphthous, the child
emaciates and gradually dies.

(D. Gregory. Epidemiology P.108)

D. Wellan states that in some
cases where no emphyse of measles
Nor superficial ulcerations have preceded. The lymphatic glands of the neck and other parts become considerably enlarged. This appearance is succeeded by a swelling and tension of the abdomen with hectic fever and emaciation.

(Dr. Wellan, Cutaneous Diseases p. 225)

15. Pertussis.

The relations of this affection with Measles have been variously regarded.

D. Grainger Stewart recognizes it as a risky complication. Many authorities think it often precedes and seems almost to predispose to Measles.

D. Goodhart regards it rather in the light of a sequela, yet he adds that though it is familiarly classed and connected with Measles, on careful examination of his cases, out of 305 cases of Pertussis he could only in any way associate it with Measles in 14.

(Dr. Goodhart, Diseases of Children p. 143)
In two cases out of my 60 there had been Pertussis about 6 weeks before.
Dr. Ringer thinks that Whooping Cough and Measles apparently predispose no one another.
(Reynolds, System of Medicine Vol. I. p. 41)
Dr. Starr thinks that there is a predisposition only in the fact of these being lowered vitality and thus greater susceptibility to other diseases.
(Dr. Starr, Diseases of Children p. 148)

16. Hysteric occasionally occurs in females about puberty accompanied even by Aphonia.
(Dr. Copland, Diet. of Medicine Vol. II. p. 318)

Dr. Starmentouis Paralysis as a rare accident associated with Measles. Dr. Bartone and Grunewald have also recorded cases of it.
(Dr. Starr, Diseases of Children p. 148)
In contrast to dangerous sequelae or complications, Dr. Helton Fogge
Thinks that Measles seem to favorably modify certain cutaneous diseases as Sebema and accordin
g to Pellegr and Bartley this holds equally true of Epilepsy, Chorea and Incontinence of urine.
(Dr. Fagge, Practice of Medicine, Vol. 14, p. 222)

Out of 60 cases of my own the complications were:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronchitis</td>
<td>5</td>
</tr>
<tr>
<td>Broncho-pneumonia</td>
<td>14</td>
</tr>
<tr>
<td>Croupous Pneumonia</td>
<td>1</td>
</tr>
<tr>
<td>Meningitis</td>
<td>3</td>
</tr>
<tr>
<td>Adenitis</td>
<td>2</td>
</tr>
<tr>
<td>Meningitis</td>
<td>1</td>
</tr>
<tr>
<td>Severe Diarrhoea</td>
<td>4</td>
</tr>
<tr>
<td>Otitis</td>
<td>2</td>
</tr>
<tr>
<td>Paroxysmal Epilalia</td>
<td>1</td>
</tr>
</tbody>
</table>

I also have one patient who has not yet thoroughly recovered and I think will eventually come under the heading of Marasmus.
Dr. J. Duncan in North Union.
Purshouse in March and June 1842 found the complications thus:

<table>
<thead>
<tr>
<th>Complication</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumonia</td>
<td>12</td>
</tr>
<tr>
<td>Contusion</td>
<td>13</td>
</tr>
<tr>
<td>Bronchitis</td>
<td>8</td>
</tr>
<tr>
<td>Phthisis</td>
<td>4</td>
</tr>
<tr>
<td>Croup</td>
<td>5</td>
</tr>
<tr>
<td>Peritonitis</td>
<td>1</td>
</tr>
<tr>
<td>Ulcerated Tonsils</td>
<td>3</td>
</tr>
<tr>
<td>Rolaupus Ani.</td>
<td>4</td>
</tr>
<tr>
<td>Ophthalmia</td>
<td>5</td>
</tr>
</tbody>
</table>

Sept. 1842. P. 26

Pathology.

Its nature seems still to be obscure, failing a better description I quote Mr. Farrow who gives this summary. When Measles terminate fatally without any complication the organs are generally found in a state of congestion more or less marked, sometimes of a blackish red color. Occasionally the follicles of Peyer and Brunner are enlarged.
as in Scarletina and Smallpox, another analogy between these diseases and Typhoid Fever. The blood which is found in the vessels after death is black and fluid and the cavities of the heart contain no coagula. The results of chemical analysis correspond to these characters; the fibrine preserved its mean proportion (3 parts per mill) M. Andral found in several adults attacked by Measles that the fibrine preserved the proportion of from 2 1/2 to 3 1/2 during the first stage but that it diminished after the eruption. The proportion of red globules is augmented; from 129 in 1000 M. Andral found it as high as 137, 140 and 146. (Bibliothèque de Médecine Pratique, Tom XIX) M. 448

The rash occupies the rete vascula of the skin, not the epidermis as Vogel supposed. Mayr and Hebra seek for the anatomical
basis of the Measles Papulone - an inflammation of the sebaceous follicle of the skin, which excites a superficial capillary injection of contiguous parts, limited by the furrows of the skin, thus losing the form of a circular inflammatory areola. The hairs which are present in the inflammatory mask are merely incidentally so; if the hair follicles specially participated the scalp would necessarily be the proper focus of the exanthem and the palms of the hands and soles of the feet would remain free, neither of which is the case.

(P. Thomas. Ziemann's Cyclopaedia of Medicine Vol. II p. 63)

A bacillus has recently been found in the urine but at present nothing specific organism nothing can be definitely stated.

Dr. Blackwood and Vacher (also A. Ranson) describe minute bodies
obtained from the breast and also
in the skin, lungs, liver etc. after
death.

(Franz. Path. Soc. of London. 1878)
Vol. XXIX p. 432)
They made the measles patients
breathe through glass tubes coated
on the interior with glycerine.
On microscopic examination they
found in every case numerous sparkling
colorless bodies; some spherical
others elongated with sharpened
ends. Healthy children and patients
with other fevers were tried in the
same way but gave negative results.
If death has occurred with comp-
lications present, the ordinary
most modern appearances common
to those complaints are found on
examination.

Etiology:
Measles is a most infectious fever
and though not so persistent as
Scarlatina, yet during the active
stage it is virulently contagious
And if there is one case amongst an unprotected number, a greater proportion will take it than would be the case with any of the other exanthemata.

(D. Bristow, Practice of Medicine p.156)

Some of the older authorities believed the most contagious time to be at the time of desquamation but this was clearly disproved by Lann in the epidemic in the Faroe Isles in 1846.

D. Tanner thought the most contagious time was during the eruptive stage.

(D. Tanner Dis. of Infancy and Childhood p.224)

D. Williams thought that the blood threw off infective emanations during the eruptive fever and prior to any eruption and it is now generally admitted that the most infectious time is during the convalescent stage.

The disease is generally handed from the sick to the healthy.
but it can be and often is carried through the medium of healthy persons by contaminated clothing. After the 3rd week if infection is carried it is usually by improperly disinfected clothes or more recently infected atmospheres, but Mays doubted if it could be easily spread by clothes as he tried justly clothes worn by patients admitted with the disease upon healthy chicks after the clothes had been simply well aired (no disinfestants) and he never by these means transmitted the disease.

The poison however seems to be chiefly given off by the breath but for some time undoubtably persists on the clothes.

It may also be spread by dust contamination and inoculation. Inoculation has been tried by many observers amongst whom we may name Wellan, Vogel, Rachael Brown, Munro and Jasshitz
has never been very successful. Dr. Willan inoculated from living vesicles but produced no effect. Wachaei was more successful. (Dr. Willan. Cutaneous Diseases p. 219).

Dr. Home of Edinburgh at the suggestion of Dr. Munro in 1758 tried inoculation but did not succeed in producing a mild disease. It was reported in one of the Austrian Medical Journals in 1842 that Michael of Katona of Borsod in Hungary tested the efficacy of inoculation in a large number of cases. In a very fatal and widespread epidemic which prevailed during the winter of 1841 he inoculated 1122 persons with a drop of fluid from a vesicle, or with a drop of the tears of an affected person, the fluid being injected in the same manner as the virus in vaccination. The operation succeeded in about 93% of the cases, producing a mild attack of measles.
A red areola at first formed around the puncture by which it was inserted, but soon disappeared. On the 7th day the fever commenced with the usual prodromata of Measles: on the 9th or 10th day the eruption appeared, on the 14th day desquamation occurred with decrease of febrile symptoms and by the 17th day the patients were generally well. In no one case of the inoculated persons did the disease terminate fatally.

Still notwithstanding this success I fear from my experience whilst acting as Public Vaccinator at a Station in the West Riding of York where there is such a prejudice against introducing poisons matter into healthy children I should require a very severe type of epidemic and more conclusive evidence of success nearer home before I would venture to advocate inoculation for Measles.
It is an interesting fact that inoculation of Measles on rabbits by Thomas did not produce an analogous affection.

(Zemmiser's Cyclopaedia of Medicine, Vol. II, Page 39)

In 1862 Dr. Salisbury of Ohio published two elaborate articles (American Journal of Medical Sciences July and October 1862) attributing Measles to the action of a fungus developed on damp mouldy straw. He described the results of numerous cases in which this fungus had been inoculated producing a modified form of Rubella which, however, was said to protect the system against a future attack of true Measles. Many observers have since tried the effect of this fungus but have never had the successful results ascribed by Dr. Salisbury.

Measles occurs sporadically
at all times but frequently as an epidemic and is then probably in some uncertain way dependent on the atmosphere and is conveyed and propagated by it.

Rosenstein says that the particular microbe or poison does not dwell in the air neither is it conveyed by that element but circulates with men and baggage from place to place. (Rosenstein Dreams of Children, translated by Spenser F. 1944)

These epidemics vary very much in severity and are generally rendered more severe by the prevalence of one or other complication. Sometimes the type is very severe and persists as such all the course of the epidemic. In Leeds from October to December 1894 the type was simple in the early part but later on almost every case was more severe. It appears to be more severe where there is crowded population and
want of fresh air. Social isolation seems only to have effect in virtue of the power of procuring airy apartments.

In a paper read to the Leeds and West Riding Medical Chirurgical Society on January 11th, 1895 by Dr. Grottiwood Cameron and reported in the British Medical Journal of February 24th, 1895, page 253 out of 1770 cases of measles occurring during 1891-2-3 in Leeds and by carefully made out statistics dividing all the houses into death houses or recovery houses, it is clearly proved that through straight, cleanliness and general absence of nuisance, overcrowding, dirt, structural and other insanitary conditions tended to satisfactory results. The relative figures were not large but still so uniform as to be conclusive.

Dr. Willan lays great stress on the "full population of any place"
The closeness and want of cleanliness in its tenements, the frequent intercourse between the inhabitants of the district where infection prevails and those of other towns and cities (Dr. William Cubberley, Diseases, p. 228).

The actual origin of the disease is still uncertain. It is transported by atmospheric influence or men and baggage (Romano) to distant countries, and some distant lands seem to escape it altogether. Thus it is stated by M. d'Anglona to have been imported into America in 1518. It first appeared in St. Helena in 1808.

Dipl Copland says that in 1838 measles was introduced into the Cape of Good Hope after an absence of 30 years by a vessel from Europe in which several instances occurred during the voyage. The chief characteristic was intensity (Dr. I. of Practice of Med., part 11, p. 822).
When it reaches a new country where none are protected by
previously having had the disease it generally appears as a most
fatal disorder probably on account of the great sufficiency of fuel
for the germs. It nearly depopulated the South Sea Islands on its
first appearance there.
In the same way on its return after a long absence the same thing
is observed. Thus it occurred after long absence in the Fiji
Islands in 1875 and in 4 months 40,000 natives died, equal to
1 in 4 of the whole population whereas in London in 1886 (an
average year) the deaths from Measles were 5 in every 10,000
living at all ages (Quoted from Comp.
by Collie then Ashby and Wright
Diseases of Children Page 227.)
D. Payne with regard to appearance in virgin soil states that:
"Measles supplies a striking
instance of the influence of
inherited immunity or partial
immunity.

(D. Payne, General Pathology p. 435)
This is the only direct reference
I can find to some notion of
immunity by inheritance.

Children seem to be the most
favorable subjects for infection,
probably because adults have
received immunity by having had
it when children, if they were
fit subjects for the virus.

Sporadic cases appear at all
seasons but epidemics occur
especially during the colder months
namely in winter and spring, this
holds good in both Arctic and
Tropical climates.

(Whitelegg, Public Health p. 269).
This holds better than
Sydenham's belief in the
prevalence during the 1st half
of the year.

I find D. Saunders also
considered January to July the most common time for measles (D. Saunders, Treat. of Physic. p. 22).

"The Measles take place mostly in autumn either with a south wind, when the air is turbid and hazy or when there is rain with any other wind."

(Quoted from George Bachishwia, quoted by Willan.)

It seems to me strange that in Leeds 60 cases came under my notice from October to December 1894, right up to the end of December, but I have not seen one single case since 1895 came in. The bells seemed to ring measles out with the old year.

Still the proportion of measles death-rate in the different seasons varies very slightly.

(D. Austen, Practice of Medicine Vol. III, p. 50)

The focus in utero is noted not from the disease, Vogel, Rosenthal and others have witnessed this.
Whilst the other exanthemata with improved sanitation have decreased in mortality measles is comparatively very little improved, probably accounted for by the fact that it is infectious before febrile symptoms are noticed.

(Blainstone and Murchison).

And again because by the public it is treated as a trivial ailment especially in the lower classes and it does not come under notice for isolation in hospitals as the other exanthemata. Indeed it is doubtful if hospital isolation of measles on a large scale would be a success as of course the requirements of accommodations would be great and we always find that where a number of cases are congregated together the mortality is always high and Hospital reports of measles always show a higher mortality than we find in private practice.
Whitelegge in Public Health
Page 474 gives this interesting table of mortality.

<table>
<thead>
<tr>
<th></th>
<th>1861-65</th>
<th>1866-70</th>
<th>1871-75</th>
<th>1876-80</th>
<th>1881-85</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallpox</td>
<td>0.22</td>
<td>0.10</td>
<td>0.41</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Measles</td>
<td>0.46</td>
<td>0.43</td>
<td>0.37</td>
<td>0.38</td>
<td>0.41</td>
</tr>
<tr>
<td>Scarletfever</td>
<td>0.98</td>
<td>0.96</td>
<td>0.76</td>
<td>0.63</td>
<td>0.43</td>
</tr>
<tr>
<td>Whooping Cough</td>
<td>0.52</td>
<td>0.55</td>
<td>0.50</td>
<td>0.53</td>
<td>0.36</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>0.25</td>
<td>0.13</td>
<td>0.12</td>
<td>0.12</td>
<td>0.16</td>
</tr>
<tr>
<td>Typhus Enfield</td>
<td>0.92</td>
<td>0.85 (0.08)</td>
<td>0.03</td>
<td>0.28</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Differential Diagnosis.
The cardinal points in the diagnosis of Measles are the slow onset and the Coryzal aspect.

Scarlatina.

In Scarlatina the child is taken suddenly ill of vomiting and within 24 hours the eruption appears. In Measles the sickness is not so frequent and the rash does not appear for 4 days. The eruption although in typical cases is distinctive it cannot be relied upon to invariably make the diagnosis.
Sometimes the rash is like measles in one part of the body and Scarlet Fever in another. As a general rule if there is neither cough, sneezing, nor cough in all probability it is not measles but this rule is certainly not absolute, but frequently in these cases other members will have the orthodox form and so clear up the difficulty, or else the sequelae will come and do so. In all these cases it is wiser to wait and see than rush at an opinion without due watching and thought. Ziegler has especially pointed out that Measles tends towards the respiratory track whilst Scarlet Fever manifests a tendency to disorder of the cellular tissue.

Epidemic Roseola or Rubella may be very like it but generally there is little cough, less fever, eruption more fluctuant appearing on the 2nd day and absence of laryngeal
Dr. Gregory believes that Villa Rubela sine Catarrho is really a case of febrile lichen and he diagnoses according to whether the rash appears after the recognized 72 hours or before. If only 24 or 48 hours of febrile convulsion before appearance of the rash he decides it is not a case of Measles.

(Dr. Gregory, Encephaline Fever p. 103)

**Variola.**

Uncertainty has often existed here but the fact that in Variola all the active symptoms are relieved by the appearance of the emphysema is quite conclusive. Afterward we get the shotty hardness of the papules in place of the soft velvety feeling of measles. Typhims and Variella.

There is absence of catarhal symptoms in these. The rash in Typhims is non confluent and appears late, namely on the 7th day.
In Varicella it is not usual.

**Syphilitic Eruptions.**
Mentioned by Ashken but may be differentiated by persistence of other syphilitic symptoms.

Occasionally Copaiba, Morphia and certain fish produce a rash usually Measles but not the other symptoms and in all these cases the rash differs in its time of persistence.

**Prognosis.**
Dr. Shaw observes that "Measles is accounted much more threatening than really dangerous."
(Dr. Shaw: Practice of Physic p. 161).
The prognosis chiefly depends on age, type and complications. It is always difficult to give a prognosis in Measles because though the type may be simple, the sequelae may suddenly appear and be very serious.

Statistics on different epidemics vary very widely but it all agrees to the danger of early age.
Of 1293 deaths in London in 1842, 53.1% occurred under 5 years old, 9.9% under 10 years.

(Whitelegg, Public Health, p. 269)

Two years of age is the most dangerous time. (Whitelegg, Public Health, p. 269)

Whitelegg gives:
60% of deaths occur during first year.
75% during first 2 years.
90% during first 5 years.

(Public Health, p. 269).

Peruvian states that 91 died out of 3807.

At the Foundling Hospital London, Watson gives in one year 1 in 10.
During another year 1 in 3.

This seems to show the varying severity of different epidemics.

Home gives 1 in 12.
Lying gives 1 in 15.


Wilson gives 10% to 12%.

(Wilson, Handbook of Hygiene, p. 388).

My own cases 4 in 60 = 1 in 15

Some malignant epidemics have a death rate of 30%. Now in Britain
The epidemics rarely rise above 5% and usually 1% or 2%.

Upon the whole, Measles is far less fatal than either Scarletina or Smallpox.

The concurrence of Pneumonia, Gastritis, Enteritis or Dysentery diminishes chances very much.

"he also declared that kind of Measles which breaks out earlier or later than the time mentioned above." (Rosenthal: Dreams of Children, Translated by Spärmann, p. 147.)

The favourable indications are:-

A moderate eruption with inclination of fever. E gallon moisture of the skin.

Moderate cough with easy expectoration.

Free and unembarrassed inspiration.

Free state of bowels and slight diarrhoea.

Towards the end is no evil sign.

Regular succession of changes in eruption.

No appearance of irregularity or conflict with vesical affection.

Relief and Barthezian.
These conclusions:
1. That normal primitive measles, simple or with slight inflammation of the respiratory or digestive organs is very easily cured. (Never fatal in B. K.'s case)
2. Normal primary but complicated measles is cured about as often as it proves fatal.
3. Anomalous measles primary and complicated is as often curable as fatal.
4. Simple secondary measles anomalous is fatal to half the cases, but the mortality depends upon the primary affection and not upon the measles.
5. Anomalous complicated secondary measles is fatal in the great majority of cases.

(Bartens, Relief, Medecine des Enfants, 2nd Ed. Vol. 2.

It has been supposed that measles has been a more severe disease since the introduction of vaccine inoculation, but Dr. Copeland and Heldtbrand think this to be quite without foundation.

(Dr. Copeland, Diet. of Medicine, Vol. II, p. 82)
Treatment.

Isolation so far as possible. If the epidemic is of a mild nature and one child in a house where others take it, it has been contended by many that it is scarcely worth while isolating those who are above two years as they probably have to take it sometime or other and have been already exposed to infection during the melancholy and invasion of the one attacked and might as well have it now and be done with it. If the child are under two or the epidemic of a severe nature, then certainly let them be isolated with every possible precaution.

Dr. Pepper advocates strict isolation in every case. (Dr. Pepper, Practice of Medicine Vol. I, p. 579). We cannot cut short the disease even if caught at a very early stage so we have to content ourselves with correcting any
unfavorable turn and tending to avert complications.
In ordinary simple Measles very little treatment is necessary.
The patient should be kept in bed, lightly covered, shielded
from all draughts and possibility of taking cold but as Dr. Smith
sagely remarks, "It is not necessary in cases of Measles to keep the
child quiet;" the skin should be cleansed every morning using tepid
water and sparing one part at a time and drying it immediately.
(Dr. Smith, Diseases of Children, p. 13).
Give a light diet with plenty of
solvent drinks and keep the bowels
open, bearing in mind the possibility
of diarrhoea supervening. With this
idea in mind, if we have a severe case it
is well to order an enema.
Small doses of Lignis Ammonii
Acetatis and Spiritus Aetheris
Nebosi may relieve the heat and
prickling or itching of the skin.
and assist the rash in appearing. The catarhal symptoms may be soothed by an anodyne mixture with specia manna or possibly small doses of Paregoric.

Sydenham prescribed an opiate every night throughout the whole course of Measles, but this is not wise, in fact no treatment can be wise which affords an absolute rule to be applied to all classes of cases, each individual case must be treated on its own merits especially with regard to drugs of this class. We can only lay down general principles in treatment to be used at the discretion of the physician.

Weller was of opinion that an emetic given in the 2nd or 3rd evening somewhat alleviated the violence of catarhal symptoms and contributed to prevent the usual diarrhoea. Several of the older authorities lay great stress on
The use of an emetic not only made them understand its action but from their undeniable good results.

D. Armstrong thought that one of its major properties depended on its being a shock to the system by the effort of vomiting and thus setting up a reaction in the system toward off the nervous congestion for he looked on an increase of arterial circulation as a physiological process aiding toward recovery as long as it was in moderation just as I remember Professor Chiree used to teach that we should look on Inflamat (reaction) as a physiological and good process in the work of repair of tissues.

D. Armstrong observes:

"From an impartial consideration of the facts which have come before me I am convinced that our plan of treating Measles is too uniformly active when the
eruptive fever is developed; and that we should be more fortunate in the main run if we interfered less with the operations of nature in cases of a mild and moderate character. (Dr. Armstrong, Practical Illustrations of Measles, 113.)

Undoubtedly Dr. Armstrong alluded here in great measure to blood letting, which was then the order of the day, the more so as he goes on to say that he still cannot consistently recommend the maxims of Hippocrates that nature is the best physician. The question arises: are we right in totally abandoning bleeding? In many instances in Medicine and Surgery of the present day we are gradually going back to ancient usages and customs admiring in moderation what for long has been totally laid aside. Our old authorities whose abilities and experience we are bound to hold in due veneration, advocated
it so strongly that we ought not to pass it by without a thought. Tocolchicin bleeds early, William bleed late, and Dr. Mead bleed in every case he could get hold of and considered it the great essential in treatment.

On the other hand, Dr. Mangat blamed bleeding for causing many deaths (which I do not doubt when practised by rule of thumb on each and every case) and made the astonishing statement that he had never heard of a death from Measles which had not been bleed. Probably this was because every case he had heard of had been bleed in orthodox fashion immediately it had come under professional notice.

The most startling fact he states is that he never himself bleed a single case and never had a death in (not from) Measles.

(Dr. Mangat, Art of Healing, p. 36)

By the use of the word "in" I
read it as not even from complications in measles, and if that is so, surely he has had an exceptional experience!

Is there no half-way measure between these, bleeding with reason? This is not a day for bleeding and yet I am inclined to think that there are some few rare cases where a plethoric child might be benefited, but without leading authorities admitting.

The treatment few dare venture to near an assault even in the hope of saving life. (Accidents to assault are not rare in Yorkshire).

If the sickness be severe it can be relieved by applying Carbolic Oil 1 in 40 to the skin. Great care should be taken of the eyes, no reading allowed and the room well ventilated and not too light. The room should not be below 65° F. Mild tonics as the symptoms
Footite of Iron, or Phosphates should be given during convalescence and the diet gradually increased. Cold lime bill if of a stumous tendency should be given.

In malignant measles stimulants are required and whiskey should be given freely as Keating has positively demonstrated morococcin in the blood and as we know the powerful action of alcohol on cultivation and see the satisfactory results of the adminstration in practice, we might almost be led to presume that some similar action takes place in the system.

If complications arise of any unusual severity of type we must treat it accordingly.

If the temperature rise to 103° or warm bath, 98° to 100° may be given and if it rise higher so as to be persistent hyperpyrexia it may be relieved by putting the child in the
above bath with a large piece of ice in the water thus gradually lowering the temperature or else by cold application over the child's head whilst the rest of the body is in the bath. Stimulants may require to be given after this treatment, but if the temperature is so severe, it will often save life when nothing else will.

Antifebrin 2 or 3 grains or better 1 grain per hour to a child watching the effect, if the temperature is 103° and we desire to lower it. I am particularly in favour of giving 1 grain per hour as I have seen several results from Antifebrin and I therefore use it with great caution.

D. Starr recommends Quinine by supposition for this purpose, 2 to 4 grain doses every 3 or 4 hours (D. Starr. Diseases of Children, p. 154).

The hard hacking cough may be relieved by painting the face and with boroglycerin.
The child should be kept in bed two days at least after the temperature becomes normal but after that as it will get up undressed if it gets a chance, in favourable cases it is well for it to be dressed and kept in its room for another week for its own safety and two or three weeks for the safety of its playmates.

Dr. Haden in his Practical Observations on Diseases of Children page 50 says such stress on the evils that undoubtedly attend neglect of keeping warm in bed that I am inclined to think that in mild cases in the lower classes some children would be better dressed from the outset, as otherwise they will be only half covered in bed and running about undressed if the attack is mild and they get a chance. Of course if the disease is severe, they will be content to lie in bed and it is the best place.

If we anticipate lung affections it is well to have a steam kettle in
The room to maintain moisture in the atmosphere.

Broncho-pneumonia must be treated as an ordinary case of such, except that we must bear in mind that the skin is so weak that great care should be exercised as regards counter irritation. I cannot understand many great authorities on Measles who readily recommend strong jution in these cases as I always have found the patients so susceptible to any form of counter irritation. I have seen one case in which the skin sloughed after the application of linear Jonthee perfectly free from mustard and I remember Professor Cheene in his lectures on surgery taking such a case which occurred to him in his earlier practice as an example to show how lowered vitality was a great factor in varying the effect of an irritant.

A few drops of Spirits Ammonii Aromatics and other stimulants may
have to be given with some liquid
Extract of Liquorice or Vinum
Scopolamica, Liquills or Paragonia.
If pleurisy supervene Mercury is
best used in the form of friction
with blue ointment over the chest
a little croton oil being added to
promote its absorption.
(Andrew Anderson quoted Galen)
This to me seems rather strong
Treatment for a skin with lowered
vitality.
where chest complications ensue.
Ironsman has recommended whipping
the whole skin with nettles.
(Quoted by Charteris, Practice of Medicine, 1842)
In general practice however, though
this may be theoretically a very feasible
form of counterirritation, I should
scarcely recommend a young practitioner
hoping to succeed, to carry out
this treatment on the majority of
our worshipped children. Fear
it would bring him into very
bad repute.
Convulsions during the early part, can usually be corrected by relieving the bowels and applying counterirritation to the skin. Deaerbroca may be very severe and cold compresses are here often useful. 30 drops of brandy, some syrup and Cinnamon water fragrantly relieves. Dilute Salicylic Acid or a drop or two of the tincture of Opium may be good given with care. Donate Powder and Bismuth. Sydenham used to say that a looseness of the bowels which followed Measles could be cured by bleeding only. (Quoted by D. Brookes, Pract. of Physic, Vol. I.) But D. Salmon comments that he is sure bleeding is not the natural way of curing this flux and he prefers an ointment. (Sydenham, Practice of Physic translated by D. Salmon, p. 45).

Laryngitis is best guarded against by painting the throat
and faces, with Boroglycerine
when the cough is crooky in character.
Ophthalmia may be relieved by
washing with mild antiseptic lotions
as Boracic Acid or Bismutpaste of Potash. The eyes should be
shaded from the light as there is
usually some photophobia. If the
ophthalmia is severe, 10 cc of
Silver 10 grains to the ounce must
be used by the physician himself
as milder astringents will not
cogulate albumen. After this
treatment the eyes should be
washed out with dilute Boracic
Acid solution.
Discharge from the ear is most
dangerous from its tendency to
decomposition, we can prevent
this by washing carefully with
Boracic Lotion and keeping a
piece of Salicylic wool in the
meatus.
Warm clothing and tonics,
iron and cool liver oil, phosphates
and hypophosphites, change of air, a dry bracing air whether sea or inland, generally restore to perfect health especially if accompanied by free and hearty diet.

Prophylactic Treatment.

In the Medical Times and Gazette July 24th, 1875, page 92, Dr. Brackenridge described how he has given Sulphocarbolic Acid of Sodum to those exposed to this and other poisons, as Scarlet Fever and Diphtheria, and although not feeling that his observations have proved the power of this treatment to prevent attacks of the diseases he is still inclined to attribute some prophylactic power to it.
References

Dr. Cullen, Edinburgh Practice of Physic.
Dr. G. Gregory, Empirick Fevers.
Dr. Helvetius (or Magy) Diseases of Skin.
Dr. Hoffman, Practice of Medicine.
Dr. Willan & Bateeman, Cutaneous Diseases.
Dr. J. Gregory, Practice of Medicine.
Dr. Thomas, Zoonomia, Berlin 1794.
Dr. Underwood, Diseases of Children.
Dr. Roberts, Handbook of Medicine.
M. Bonedart, Malad des Enfants Nouveau-Bé.
Dr. Stare, Diseases of Children.
M. Blache & Grousard, Dictionnaire de Medicine.
Dr. Copland, Dict. of Medicine.
Parker on the Urine.
Dr. Rapin, Reynolds System of Medicine.
Guer, Letters from West Indies, London 1778.
Dr. Flint, Practice of Medicine.
Dr. Heaton Foppe, Practice of Medicine.
Dr. Craigie, Practice of Physic.
Dr. Clark, Observations on Fevers.
Dr. Hamilton, Hints on Principal Dist Cholera.
Dr. Athkin, Practice of Medicine.
Dr. Fowler, Section of Medicine.
Dr. Bristow, Practice of Medicine.
Dr. Mannosell, Evanston, Phil. 1883.
Dr. M. Pepper, Diseases of Children.
Dr. Barlowe, Practice of Medicine.
Buchan de Ferraura, 1809.
Dr. Marshall Hall, Practice of Medicine.
Rosenstein, Diseases of Children.
Dr. Hume, Medical facts & experiments.
Dr. Hensh, Diseases of Children.
Bergin's Manual of College of Medicine, 1765.
Dr. Enslow Smith, Diseases of Children.
Dr. Mackintosh, Practice of Physic.
Dr. Pepper, System of Practical Medicine.
Dr. Haden, Pract. Ophthalmia, &c.
Dr. Washam, Kellogg Cyclopaedia of Diseases of Children.
Dr. Dennis, Treatise on Diseases of Children.
Dr. Tanner, Practice of Medicine.
Dr. Armstrong, Illustrated Mehols, London.
Dr. Ashby & Wright, Diseases of Children.
Shell's on Diseases of Children.
Dr. Churchill, Diseases of Children.
Dr. Payne, General Pathology.
Euchlin, Lessons & Art of Surgery.
Dr. Goodhart, Diseases of Children.
Dr. Tanner, Diseases of Infancy & Childhood.
Dr. Shaw, Practice of Physic.
Drs. Saunders, Practice of Physic.
Dr. Whitehouse, Public Health.
Drs. Brookes, Practice of Physic.
Dr. Gedenham, Practice of Physic.
Dr. West. Dis. of Infancy & Childhood.
Drs. Guy. Hooper's Vade Mecum.
Drs. Wilson, Handbook of Hygiene.
Drs. Mungall, Art of Healing.
Drs. Charlewise, Practice of Medicine.
Bartley a Rchrift, Maladies des Enfants.
American Journal of Medical Science. 1862.
Dublin Medical Journal. 1842.
Jour. Path. Soc. of London. 1876.
Medical Times & Gazette. July 1875.

Whenever I have mentioned
Drs. Willan. Cutaneous Diseases. I
refer to Drs. Willan & Bakerman's
Cutaneous Diseases Volume II.