

An abnormal course of different exanthemata, however, may be characterized by features of anomalous nature, and various lesions due to simple cutaneous irritation may complicate the eruptions. Erythematous, papular, vesicular, and pustular lesions may accompany any of these fevers, and may lead to errors of diagnosis. It is, therefore, not asking too much to insist that, before such coexistences can be definitely accepted, the evidence should include a sufficient number of cases of persons previously unaffected by either of the fevers in question, who have remained free from infection after subsequent exposure. Examples of one specific eruptive fever following another in near succession are sometimes observed; thus, Prior had a patient who developed scarlet fever November 18th, varicella December 2d, and measles December 13th.

**SEQUELÆ.**—These are either complications persisting after the subsidence of the exanthem, or they develop in consequence of some predisposition intensified or evoked by it. The power of resistance of the system is diminished by measles, and, under these circumstances, certain external influences may provoke morbid actions which, under more favorable conditions, they cannot. Thus, any affection attacking one lately recovered from measles must, strictly speaking, be called a sequela. As far as possible, however, it is better to restrict the term to those disorders in which the parts implicated are especially involved in measles, and which can be definitely attributed to its effects. In this sense, nearly all sequela of measles may be said to originate in the mucous membrane. Not infrequently, more or less severe chronic conjunctivitis, with obstinate blepharitis and hordeoli, follows measles. Keratitis and even keratomalacia, and other alterations in the orbit, may be occasionally observed. Catarrh of the middle and external ear, with sometimes persistent otorrhœa, is not very uncommon. These catarrhal inflammations may result in changes that produce more or less complete permanent deafness. Catarrhal and aphthous, even gangrenous, stomatitis sometimes follows measles. Whether by extension of these forms, or by spontaneous development, that, fortunately, rare buccal affection, *cancreum oris*, or *nomia*, or gangrene of the mouth, has measles for its most frequent exciting cause (except, perhaps, mercurial pyalism). Its course is usually a fatal one. Pharyngeal and laryngeal catarrh very commonly follow in the wake of measles. Usually, they are of brief duration. Ulcerative inflammations of these parts sometimes occur, and in the larynx may accompany or precede pulmonary phthisis. Bronchitis is the most common sequela of measles, carried over from the height of the attack. Its course is for the most part in the direction of health, but it too often becomes protracted, and leads to bronchopneumonia and pulmonary phthisis. Bronchopneumonia may develop after the effects of the measles seem to have disappeared, a slight cause serving to upset the balance of the lung, enfeebled by the antecedent attack. Croupous or lobar pneumonia may be similarly developed. Acute miliary tuberculosis may follow one of the affections just mentioned, or, developing at once, may pursue a rapidly fatal course. It is resulting pneumonia, catarrhal and croupous, and pulmonary phthisis, that make measles so formidable a disease, and a high death-rate in this disease is usually to be referred to one or other of these complications or sequela. Tuberculous disease in the bronchial and mesenteric glands may indirectly become sequela of measles, the latter following tuberculosis of the bowels. Enterocolitis, of very severe character, may sap the powers of life or greatly retard convalescence.

Measles may itself complicate other diseases, modifying and being modified by them. The coexistence of the acute eruptive fevers, and the influence of a pre-existing disease upon the course of measles, have already been considered. On the other hand, measles undoubtedly modifies the course of other diseases upon which it has become engrafted. Barthez and Rilliet have shown that a noxious influence is principally exerted over affections

that are most frequently met with as true complications of measles. This disorder occurring during an attack of bronchitis, of lobular or lobar pneumonia, or of pulmonary tuberculosis, will almost invariably intensify them, the yielding inflammation will be rekindled, and new areas will become involved. Recrudescence of tubercle will scarcely fail to occur in tuberculous patients, and inflammations of mucous membranes will be made more active. Some other affections, however, seem to become ameliorated upon the supervention of measles. This may be real or only apparent. In the latter case the original disease will fade away during the attack, to return in full vigor after its disappearance. Examples of this may be seen in various cutaneous disorders, such as eczema, seborrhœa, psoriasis, etc., and in affections of different organs of the body. It has been asserted, again, that a number of diseases may be radically and permanently removed by a complicating attack of measles. Barthez and Rilliet have seen chorea, epilepsy, incontinence of urine, etc., disappear after an attack of measles.<sup>10</sup> Thomas has also had a similar experience.

**Relapses and Reinfections.**—There may be very rarely observed, in persons who have entirely recovered from measles, the sudden outbreak of an eruption exactly like that of measles in configuration, though hardly ever attaining more than a pale red coloration, and not accompanied by œdema of the skin or attaining a very wide distribution. Simultaneously, there will be very slight fever and catarrhal symptoms, not exceeding slight conjunctival hyperæmia and redness of the upper air passages. There may even be no fever at all. The appetite may not be affected, and the sense of well-being in no wise modified. The eruption is most abundant about the face, neck, and trunk, but may invade the general surface. It is exceedingly fugacious, hardly lasting more than twenty-four hours. These attacks usually occur within a few weeks after the original seizure,<sup>\*</sup> and correspond closely to the descriptions of Rôtheln, as given by certain writers. It is difficult to regard such attacks as other than relapses of measles. True reinfections, however, certainly do occur not so very rarely. Trujawsky<sup>11</sup> noted 14 cases of recurrent measles in 200 cases observed by himself. Six of these were in children less than ten years old; 6 were in children more than ten years old; 2 were in adults. The intervals between the attacks were from six months to seven years, the average being three years. Kassowitz has also reported cases of reinfection in which the attacks closely resembled Rôtheln. They, however, could be traced to exposure to the contagion of measles, and themselves communicated measles to others. The failure to appreciate the frequency of relapses and recurrences of measles is undoubtedly a fruitful cause of error and discord among writers.

Of *second attacks*, as distinct from recurrences, Maizelis has gone through the literature, and gleaned only 106 cases, of which 103 were second attacks, and 3 represented a third attack (*Virchow's Archiv*, cxxxvii., p. 468).

**ETIOLOGY.**—Measles is an epidemic, contagious disease. All races of men are liable to it. The sexes are affected in almost equal proportion.† Although it nearly always attacks young persons, those of advanced age have no immunity beyond that conferred by infection in earlier life. Infants of tender age possess an immunity. "Jurgenssen (*Deutsches Archiv f. klin. Med.*) asserts that very young infants are 'immune,' and cites a recent series of observations of 41 exposed to measles. All over six months contracted the disease, while the 25 under five months were not affected" (*Archives of Pediatrics*, 1899, vol. xvi., p. 727). This immunity is not absolute, however, and a number of writers have reported observations of measles in new-born children. Beyond the first half-year of life this insusceptibility rapidly disappears, and

\* Trujawsky records six such cases, in which the intermission was from six to fourteen days, with a medium duration of eleven and five-eighths days. In these cases, however, the second attack was of equal or greater severity than the first one.

† Of 276 cases noted by Pott, 147 were in girls and 129 in boys.

after the second year nearly all who are exposed to the contagion contract the disease. It is remarkable, however, that a few persons preserve an absolute immunity under any degree of exposure, and that numbers enjoy a temporary immunity, escaping many exposures unscathed, but finally yielding to the infectious influence. There is no reason to suppose that measles ever arises spontaneously. It is essentially contagious and is usually communicated by direct exposure to the emanations of a person sick of the disease, or through actual contact. The danger of contagion is proportionate to the propinquity of the contaminating influence, being greatest in the sick-room. It cannot be denied that measles may be spread by mediate contagion. In such cases the clothing probably becomes the disseminating agent. Such articles as have been used by the patient, the bed linen, even those things which have been used in the sick-room, very frequently communicate the disease. The discharges from the patients are not above suspicion in this regard. Except smallpox, measles is probably the most contagious of the exanthemata, and is communicable from the early prodromal stage until desquamation is completed. The infectious properties are probably most active during the prodromal stage. The great difficulty of identifying measles during this stage in great measure explains the rapid dissemination of the disease in schools, asylums, etc. The contagious properties continue throughout the stage of eruption, but speedily diminish with it, and probably become extinct during desquamation. Girard declares that quarantine is no longer needed after the eleventh day of the disease.\* On the other hand, there are those who consider infection possible for several weeks after the disease has spent itself.

The contagion of measles exists in the blood<sup>12</sup> and in tears, in expired air, in nasal secretions, in sputa, and in epithelial and epidermic structures. Many efforts have been made to determine its exact nature. Its power of indefinite increase from the smallest possible beginnings seems to preclude a gaseous or liquid origin, and all probabilities favor the conception of a living organic substance, a *contagium vivum*, as the essential cause of measles. In 1862 Salisbury<sup>13</sup> declared that a peculiar fungus found in straw is the true measles germ and he claimed to have produced the disease by inoculating unprotected persons with this fungus. His researches, though important as among the first in the now widely worked field of parasitic pathogenesis, have never been confirmed. Coze and Feltz<sup>14</sup> and Keating<sup>15</sup> found micrococci in the blood, and Ransome, Braidwood, and Vacher, in the breath of patients with measles. In the sputa of patients with measles Eklund detected an organism 1.5  $\mu$  in diameter, united in numbers of two, three, five, to eight, or more, to form chaplets. These he also found in blood from the eruptive lesions and in the urine. He named this organism *torula morbillorum*.<sup>16</sup> A bacillus has also been found in the urine in measles by Le Bel. There have since been numerous reports of the discovery of organisms in the blood and secretions of measles patients; Canon and Pielicke found a bacillus, and Döhle parasitic protozoa, which were supposed to be the specific cause of measles. Other workers have made other reports, but these observations have differed too widely in their results to justify, at present, any conclusions regarding the specific nature of the contagious principle of measles; and it may be safely said that up to the present time the specific organism which causes measles is not known to us.

Though measles may be communicated through inoculation of blood, tears, saliva, etc., ordinary infection probably always occurs through the mucous membrane and its products, particularly that of the respiratory tract, the epithelia serving as contagium bearers.

In larger cities measles is probably endemic. In small towns and in rural districts, there are often long intervals during which it is not observed. It displays a

\* Hebra and Mayr and Munro assert that epidermis shed during the stadium desquamations cannot communicate measles by inoculation.

pronounced tendency to prevail epidemically; indeed, epidemics recur with such apparent regularity, that a definite periodicity has been attributed to its recurrences. Closer observation, however, shows that no such periodicity exists, and that the extension of the disease depends upon two factors: "the time of importation of the morbid poison, and the number of persons susceptible to it."<sup>17</sup> Epidemics appear to be of greater severity in proportion to the infrequency of their occurrence. Localities where the disease does not prevail during prolonged intervals are said to experience its most intense types. A high rate of mortality is observed in races of men among whom measles prevails for the first time. This tendency has been supposed to be due to the action of the contagious virus operating upon the bodies of those who have not inherited through generations some capacity for resistance to its influence. There can be no doubt that different epidemics exhibit different types of severity or tendencies toward certain modifications or complications. The causes of this variability remain undiscovered. There is reason to believe that the great mortality following measles that prevails in a community for the first time, is in large measure due to the ignorance of the proper methods of treatment and general management of those affected. Just as bad hygienic conditions surely increase the mortality from measles, so will they the more readily under the circumstances now referred to. Accumulated evidence shows that even where the death rate is at the highest, the disease is still very amenable to proper treatment. Masterman writes: "At the beginning of the Brazilio-Paraguayan war, an epidemic of measles swept off nearly a fifth of the national army in three months, not from the severity of the disease, for I treated about fifty cases in private practice without losing one, but from want of shelter and of proper food."<sup>18</sup> Identical results were obtained under similar conditions in the Hudson's Bay Territory, the Fiji Islands, and elsewhere. No season exhibits any special influence upon the type of the epidemic. The mortality of winter and that of summer are about the same, but the disease is undoubtedly more prevalent during the colder than during the warmer months (Hirsch). In warm climates measles pursues a course equally favorable as in temperate regions, though there is a greater tendency toward intestinal complications. Local conditions of soil exert no influence in the etiology of the disease. The existence, in an individual, of chronic disease, especially of the respiratory mucous membrane, as bronchitis, pertussis, or tuberculosis, is said to predispose toward attacks of measles (Mayr).

**MORBID ANATOMY.**—In fatal cases of measles the blood, after death, is of a bluish or brownish-red color, and is seldom completely coagulated. "It is sometimes thick and tarry, sometimes thin and of a cherry-red color" (Mayr). According to Mayr, the eruption of measles is characterized by the pouring out of exudation about the mouths of the hair sacs or sebaceous glands. On the other hand, G. Simon found no change in the hair sacs or sebaceous glands, nor even in the cutaneous papillae. He found the epidermis not separated from the corium, but slightly swollen over the papillae.<sup>19</sup> Neumann<sup>20</sup> concludes that the pathological changes in the skin are almost limited to the glands and vessels. In the superficial vascular area there is round-cell proliferation of the vessel walls, and especially in the papillary loops. The vessels themselves are dilated and hyperæmic. The sebaceous and sweat follicles are infiltrated with round cells. Cell infiltration of the *arrectores pilorum* is also observed. The cutis proper and the epidermis are almost unaffected. The changes in the mucous membranes are mostly those of ordinary catarrh. Traube has described a condition of the lungs observed by him in a number of children, who died during an epidemic of measles, which he calls "catarrhal interstitial pneumonia." In these the changes were very similar to those of the phthisis of adults, though the lower lobes were principally affected, and the process was at most only eight weeks old. In addition to evidences of catarrhal pneu-

monia, though the density of the lung could not be attributed to filling of the alveoli, many capillaries were empty. This condition was caused by a cell accumulation between the capillary wall and the lung epithelia. Traube thought that these cells were from the bronchial mucous glands, and that the entire process was an adenitis of these glands.

**PROGNOSIS.**—Under favorable conditions a fatal termination of uncomplicated measles is most rare. Indeed, except in cases of malignant or "black" measles, it may be said never to occur. Meigs and Pepper reported not one death in two hundred and fifty-seven cases. The complications of measles are, however, so many, and of such frequent occurrence, that what would ordinarily otherwise be quite a trivial malady, becomes frequently a source of great danger, and is often followed by death. It is thus that measles presents quite a formidable death rate, death occurring most often during the second week—that is, after the course of normal measles would have been completed. The rate of mortality varies within wide limits. Ranke, in Munich, records a rate of 1.7 per cent. Of 844 cases Pott noted a mortality of 24, or 3 per cent. In St. Joseph's Children's Hospital, in Vienna, observations, extending over twenty years, showed a mortality from the disease of 8 per cent. On the other hand, a mortality of 44 per cent. was observed in the Hospice des Enfants Assistés, in Paris, during the years 1882 to 1885. In an epidemic in Sydney, reported by Carroll, in which there was a tendency toward malignancy, 54 of 900 measles cases perished. Fleischmann records 162 deaths in 740 cases; the minimum annual mortality was 2.3 per cent., the maximum rate was 31 per cent. His cases were classified as follows: Under one year, 35 cases, 18 deaths, 51 per cent.; from one to four years, 355 cases, 123 deaths, 34 per cent.; from five to eight years, 350 cases, 21 deaths, 6 per cent. Under five years there were 390 cases with 141 deaths, or 36 per cent. Every fifth child had pneumonia. Of these, 66 per cent. died. This high rate of mortality is due to the bad hygienic surroundings of children previous to their admission to hospital—conditions favoring the development of fatal inflammations. In malignant epidemics a much higher death-rate may be attained. At Lippe, in Hungary, in 1856, 50 per cent. of those attacked succumbed. In some epidemics there is developed a greater tendency toward dangerous complications than in others. The prognosis is always incomparably more favorable in patients whose surroundings accord with the best hygienic conditions. It has already been shown that the high death rate in certain races and localities is mainly attributable to want, exposure, foolhardiness, and not to especial malignancy of the epidemic. The great mortality from measles in camps results from the necessarily exposed life of the victims. (See article on *Camp Diseases*, in Vol. II.) Under nearly all conditions the prognosis will depend upon the presence or absence of complications. Of these pneumonia most often destroys life. Lobar pneumonia, it is true, most often runs a favorable course, but catarrhal pneumonia is of much greater gravity, both immediately and remotely, as serving to initiate the processes leading to pulmonary tuberculosis. The extent and intensity of the pulmonary inflammation will serve as an index to the gravity of the case. Catarrhal croup is usually of not great importance, unless accompanied by oedema and spasm of the glottis, in which event death may ensue at once. Diphtheria, whether attacking the laryngeal and tracheal and pharyngeal mucous membrane, or any other portion of the respiratory or general mucous surface, is not very uncommon, and usually leads to a fatal issue. Convulsions occurring at the outset of the attack add but little gravity to the case, but occurring during the eruptive stage, or that of decline, they are most ominous, as denoting the occurrence of dangerous complications that commonly end in death. The development of gangrene or of tuberculosis augurs unfavorably for the patient, the first usually, the latter always. In certain cases, and in certain epidemics, there is a tendency toward inflam-

mation of the bowels. This may develop into severe complications, and may prove fatal. The persistence of high fever beyond the usual period, the occurrence of delirium, of great rapidity and difficulty of respiration, of uncontrollable diarrhoea, and of convulsions, the sudden, premature recession of the rash, copious and repeated epistaxis—all increase the gravity of the situation. Measles occurring in a person already suffering from a serious disorder is very apt to terminate unfavorably. In delicate and feeble children, especially those whose respiratory organs are feeble; in persons exhausted and broken down by exposure, hunger, insufficient nourishment, prolonged marching, etc., measles may prove a most dangerous malady. Children of less than two years stand in more danger, when attacked, than those of greater age. Adults are more liable to fatal complications only when their conditions of life are especially unfavorable. Pregnancy is said to add greatly to the dangers of measles, and abortion may ensue. This statement is true only in a limited sense, and cannot be made of general application.

**TREATMENT.**—There is no specific treatment for measles. Its management will depend upon the type and the intensity of the attack, the nature and character of various symptoms and complications, the condition and surroundings of the patient. Very little need be done for a case of simple, uncomplicated measles. Most cases will do very well without any medicinal treatment whatever. Upon the appearance of prodromal symptoms, the child should be confined in a comfortable, well-ventilated room, free from draughts and dampness, at a temperature ranging from 69° to 70° F. during the colder months. Until the increasing severity of the symptoms destroys the desire to be up and about, the little patient need not be kept in bed. As the stage of eruption approaches, he will usually become so uncomfortable that he makes no objection to confinement in bed. During this period, a warm bath may allay the highly irritable condition of the nervous system so often observed. It also certainly favors the evolution of the eruption, if given toward the end of the third or during the fourth day. As the eruption develops most copiously about a locality where active hyperæmia has been artificially induced, as by a sinapism, so the general cutaneous hyperæmia induced by a hot bath will facilitate the evolution of the general eruption. The child may be immersed in a bath of from 90° to 100° F. for from three to five minutes, and when removed should be immediately wrapped in blankets, when, without the use of towels, it will soon become dry enough to be dressed in its night-dress. Warm drinks are, in the writer's opinion, a very useful agent in inducing gentle diaphoresis and in promoting the normal development of the eruption. Of these, hot lemonade and flaxseed tea are probably the most satisfactory. Though the temperature during the prodromal stage may already reach a high degree, it will very infrequently be necessary to employ cold bathing or other active antipyretic treatment at this period, or, indeed, at any period of normal measles. In ordinary cases the use of cold water externally, while probably not harmful, does not offer any especial advantages, in view of the usual natural tendency toward recovery. Although cold bathing is recommended by Thomas and others, with cold compresses and packs, whenever the temperature reaches 103° F., its employment can be considered important only in pronounced hyperpyrexia, a rare condition in measles. Should there be insomnia, restlessness, or premonitions of convulsions, one of the bromides will prove invaluable.

As the eruption begins to appear, all active medication may in most cases be neglected. Ordinary vigilance in controlling the movements and behavior of the patient, the administration of proper food, the maintenance of proper ventilation and temperature, will be all that is required in many cases. Very often, however, certain symptoms become unduly prominent and call for alleviation. The catarrhal symptoms, for example, may be distressing. Bronchitis may be severe and associated

with more or less troublesome cough, and even with the signs of spasmodic croup. An expectorant, with or without a bromide, will here prove of great assistance. Tartar emetic, which might otherwise be most serviceable, is here inadmissible on account of the diarrhoea so frequently present, which it might tend to aggravate. Squill, ipecac, senega, in various combination, in the ordinary popular cough syrups, may be given with or without small doses of opium. The vomiting, which is sometimes very annoying, may often be relieved by drop doses of dilute hydrocyanic acid, by crushed ice, by small quantities of brandy or champagne, or by any of the agents usually employed to control nausea and vomiting; or it will often quickly subside spontaneously, if the stomach be allowed to remain at rest until the desire for food has returned. The use of purgatives should be avoided, if possible, as, from the habitual tendency toward diarrhoea in measles, this may be suddenly aroused and become troublesome. When decided constipation is present, it is better to use enemata or the milder laxatives and purgatives, such as castor oil, rhubarb, or magnesia. When the eruption prematurely recedes, as from the occurrence of grave complications, it is useless to attempt to effect relief by efforts to recall it. Attention should be concentrated upon the intercurrent malady. Epistaxis is not apt to produce alarming consequences. The application of ice to the nose under these circumstances is not advisable. Compression of the facial and nasal arteries will often control the hemorrhage. Remedies ordinarily influencing epistaxis—ergot, turpentine, sulphuric acid—and the various appropriate external applications must be employed. The diet should be of the simplest character. Indeed, during the first few days, anorexia is so complete that all nourishment is refused. Since the course of the disease covers only a few days, this is of small importance, and the patient may be spared the importunities of over-anxious mothers and nurses. Milk, alone or with lime water, will often be acceptable, and may be given to the exclusion of everything else. Malignant measles will require the energetic administration of alcohol, carbonate of ammonia, and other stimulants. Under the use of such remedies a not insignificant proportion of these cases will recover.

Complications originating in the respiratory apparatus call for special treatment. Croup, whether catarrhal or diphtheritic, requires the same treatment as when primary. Capillary bronchitis, catarrhal and lobar pneumonia, should be treated in the ordinary manner, but with especial reference to their debilitating consequences as complications. Counter-irritation and warmth must be applied to the chest. The oiled-silk jacket here serves an excellent purpose. Poulitices, when properly applied over the affected lung, serve admirably, but the dangers from improper management, the tendency to dampen the clothing and chill the surface when unskillfully used, may well deter one from their use. Expectorants containing the chloride and carbonate of ammonia, quinine, and such agents should now be employed, and especial attention paid to the diet, since the illness will now be protracted beyond the usual period. Diarrhoea does not often call for interference, as it will nearly always spontaneously cease after a day or two. A dose or two of opium, with subnitrate of bismuth, or a few grains of Dover's powder, or some drops of camphorated tincture of opium, will, in nearly all cases, prove effective. Catarrhal affections of the eye and ear require some attention. For most cases the simple exclusion of light, or an eye wash of tepid water or milk, is all that is required. More severe inflammation requires especial treatment in accordance with its intensity. If the eyelids adhere, they must be separated by bathing in warm water and anointing with cold cream. The more severe disorders of the eye demand more energetic and special treatment. Aural inflammations spread from the buccal and nasal cavities, and often excite violent earache, which must be combated with warm opiated instillations through the external auditory canal. Atropine frequently acts charmingly in this condition, administered

in two- or three-drop instillations of a two- or four-percent. solution. In the more severe cases of inflammation of the middle ear it will be found necessary freely to incise the membrana tympani. Hyperpyrexia will not occur in uncomplicated measles. When it occurs it should be treated upon general principles. Great relief is often afforded patients affected with measles by inunctions of camphorated oil, cold cream, or other fatty substance. Milton has highly extolled this method of treatment.

The patient should be kept in bed until all fever has subsided, and should not be permitted to leave his room until the disappearance of all symptoms, normal or abnormal. During convalescence appropriate tonics, ferruginous and otherwise, will prove valuable. Cod-liver oil should be administered to weakly persons or those who continue to have weak lungs after the attack.

**PROPHYLAXIS.**—Measles is so intensely contagious that nearly all persons are attacked by it before adolescence. Unfortunate results so often follow the disease, however, that no one is justified in not placing unprotected persons beyond its influence. With measles the difficulty of accomplishing this is especially great, since it is already intensely contagious during the prodromal stage, when accurate diagnosis is often impossible. A person with measles should be separated from those who are unprotected, in a room into which only the attendants should be allowed to enter. Communication with the rest of the household should be as restricted as possible. All soiled linen should be soaked in disinfecting watery solutions and boiled separately. During the eruptive period the contagion will be much less disseminated if the whole surface of the body be systematically oiled once or twice daily. Isolation must be practised until all symptoms have subsided. Recent investigations make it very doubtful whether the disease can be communicated during desquamation. Some writers assert that a month should elapse before the patient be permitted to mingle with unprotected persons. Others (Girard) claim that quarantine is not necessary after the eleventh day of the disease. A hot bath administered at this time will remove nearly all desquamated epidermis, and along with it the contagious principle. Inoculation with the contagion-bearing particles from patients with measles has heretofore always educed unmodified measles, but it is not impossible that procedures may ultimately be discovered whereby prophylactic measures similar to those employed against smallpox, by inoculation, may be made available.

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Revised by R. J. E. Scott.

- <sup>1</sup> Hirsch: Handbook of Geographical and Historical Pathology. New Sydenham Society Transl., vol. 1.  
<sup>2</sup> Gazette des Hôpitaux, Août, 1868.  
<sup>3</sup> Thomas: Ziemssen's Cyclop., vol. II., p. 40.  
<sup>4</sup> Medical Thermometry, N. Syd. Soc. Transact., p. 343.  
<sup>5</sup> Monti: Jahrb. f. Kinder., N. F., 1872, v.  
<sup>6</sup> Carroll: Dublin Quarterly Journal Med. Sci., 1868.  
<sup>7</sup> Squire: Archives of Dermatology, vol. VIII., p. 225.  
<sup>8</sup> Cheadle: *Ibid.*, p. 220.  
<sup>9</sup> Schmidt-Rimpler: Berlin. klin. Woch., Nos. 15 and 16, 1876.  
<sup>10</sup> Kossowitz: Oest. Jahrb. f. Pädiatrik, Bd. I., 1874.  
<sup>11</sup> Ziemssen's Cyclop., vol. II., p. 47.  
<sup>12</sup> Gazette des Hôpitaux, 1870, 37, 38.  
<sup>13</sup> Fleischmann: Arch. f. Dermatol. u. Syphilis, 1872, p. 227.  
<sup>14</sup> Charité-Annalen, 1874, Bd. I., 1876.  
<sup>15</sup> Prag. med. Woch., 1876.  
<sup>16</sup> Loc. cit., p. 202.  
<sup>17</sup> Dorpater med. Zeitschr., III., 1873.  
<sup>18</sup> Home, 1757; Speranza, 1812; Katoni, 1842.  
<sup>19</sup> American Journ. Med. Sciences, 1862.  
<sup>20</sup> Maladies Infect., 1872.  
<sup>21</sup> British Medical Journal.  
<sup>22</sup> Annales de Dermatol. et de Syphilogr., III., p. 404, 1882.  
<sup>23</sup> Hirsch: Geograph. and Histor. Pathology. New Sydenham Soc. Transl.  
<sup>24</sup> Hirsch: *Loc. cit.*  
<sup>25</sup> Hebra: Skin Diseases. N. Syd. Soc. Transl., vol. I., p. 177.  
<sup>26</sup> Wien. med. Jahrb., 2, 1882.  
<sup>27</sup> Koplik: Archives of Pediatrics, 1890, vol. XIII., p. 918.

**MEAT INSPECTION.**—Since the flesh of different quadrupeds, birds, and fishes constitutes an important part of the food supply of man, the importance of requiring that it should be furnished for this purpose in a sound and healthy condition is sufficiently apparent. For this purpose a system of inspection is necessary, in order that