Description of the distinct, confluent, and inoculated smallpox, varioloid disease, cow pox, and chicken pox / By John D. Fisher.


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NOTE.

It will be observed by the Subscribers to the following work, that the author has more than fulfilled the promises which he made in his Prospectus. In that it was stated that "the work will be composed of *Twelve Plates*, quarto size, and a number of pages of text explanatory of them." In addition to what was then promised, the author has added one Plate, (Plate V.) and more than fifty pages of text, in which is given a particular description of the diseases delineated in the Plates. Although this addition has been attended with much additional expense, still the price of the volume to subscribers will not be enhanced. To non-subscribers it will be *Twelve Dollars*.

DESCRIPTION

OF THE

DISTINCT, CONFLUENT, AND INOCULATED

SMALL POX,

VARIOLOID DISEASE, COW POX,

AND

CHICKEN POX.

ILLUSTRATED BY THIRTEEN PLATES.

BY JOHN D. FISHER, M.D.

BOSTON:

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DUTTON AND WENTWORTH....PRINTERS.

1829.

TO

JAMES JACKSON, M.D.

PRESIDENT OF THE MASSACHUSETTS MEDICAL SOCIETY, AND PROFESSOR OF THE THEORY AND PRACTICE OF PHYSIC, IN HARVARD UNIVERSITY.

DEAR SIR,

THE work which I now have the honour to dedicate to you owes its origin to some observations which you had occasion to make during the course of lectures delivered at the Medical College of Harvard University in the winter of 1824-5. You there spoke particularly of the difficulties commonly experienced in distinguishing the variolous from other eruptive diseases, and mentioned it as a matter of regret that the profession were not possessed of a series of coloured engravings illustrative of the progress of that disorder. With the hope of being able to contribute some assistance to the labours of my medical brethren, I have undertaken to supply this deficiency. The paintings from which the plates in this volume are engraved, and of which they are accurate copies, were made in the Hospitals of Paris during the years 1825 and 1826, a period at which the variolous disease prevailed epidemically in that city. They were executed by a French artist under my own immediate direction, and were all begun and finished at the bed-side of the patients from whom they were taken.

In making the drawings I have been careful to attend to a circumstance of some importance in attempting an accurate and intelligible representation of the diseases intended to be illustrated by them. Neither the severest, nor the mildest cases were selected, but those of moderate severity, as it was thought that delineations of the maladies equally removed from the two extremes would be the best calculated to guide the unexperienced practitioner

to a correct diagnosis. For the same reason I have not depicted the distinct and confluent forms of the variolous eruptions in their most decided and extreme character, but have chosen such a modification as seemed to me the best suited to exhibit their most important peculiarities. The progressive developement of the eruptions described in the following pages has also been delineated in order that the observer may not fail in some stage of their progress to identify them in the living subject with their representations in the plates.

In the text I have merely given an explanation of the plates and a description of the diseases represented in them. To have done more would have been foreign to the object of the work. It will be observed however, from the descriptions, that I have considered it as an established fact, that the small pox and the varioloid are one and the same disorder, the latter being only a modification of the former, and that the chicken pox is a separate and independent malady. This, if I recollect right, was your opinion expressed in a medical journal soon after the publication of Dr. Thompson's theory upon this subject. All the observations which I have been able to make, go to confirm the truth of the opinion. Indeed the facts that the small pox and the varioloid are capable of engendering each other, and that the chicken pox has, year after year, prevailed epidemically in many of our towns in which the small pox never appeared, and consequently without giving rise to it, settle the question concerning their identity.

As an acknowledgement of the origin of my performance, and the many favours for which I am indebted to you, I take the liberty of submitting to your notice the following pages.

J. D. FISHER.

BOSTON, JANUARY 23, 1829.

CONTENTS.

EXPLANATION OF PLATES

I. II. III. IV.

In the Portraits contained in these four plates, is represented the natural distinct Small Pox eruption as it appeared on the face and hand of a male child, on the *second, fourth, sixth,* and *eighth day* after it broke out. This little boy had never been vaccinated, and after an exposure to the small pox, in consequence of being in the Hôpital des Enfans Malades at Paris, where this disease existed, he became sick on the 16th of August, 1826, and after three or four days of severe fever, he began to break out with the eruption. A few hours previous to the appearance of the pimples, an efflorescence, the characters of which are well delineated on the *hand,* plate I., arose on the face and different parts of the body. Soon after the appearance of this efflorescence, numerous small, hard, moveable and well defined pimples were seen rising up out of it as from a red ground. These increased in number and size for about two days, when the face, body and extremities were thickly studded with them. Towards the end of the second day, and at the period when the eruption was nearly completed, a portrait of the child with a part of the eruption was painted, of which that in plate 1, is an engraved copy. A small part only of the pocks which existed on the face and hand, were painted, but particular care was taken to select such of them as would convey to the eye the best picture of the eruption, as it exhibits itself during the first two days of its existence. The pocks which are represented at *a, a,* &c. had but just made their appearance when the painting was made; those which are delineated at *b, b,* &c. had been a number of hours developed; while those represented at *c, c,* &c. were about one day old when painted, those again which are represented at *d, d,* &c.

were about thirty-six hours old when sketched. The eruption when painted, as shown in the plate, was diversified in its appearance, in consequence of the pimples varying in age, size and structure; some being only an hour or two old, and no bigger than a pin's head, whilst others were twice as large, and had small vesicles on their tops.

In the Portrait in plate II. the same pocks are represented, but at a more advanced age. The painting for this portrait was made on the *fourth day* after the eruption first appeared, and at the same hour of the day on which that for the portrait in plate I. was executed. The pocks therefore, as represented in the portrait in plate II. were just two days older and more advanced in their course than when the first painting of them was made. At this period all the pocks had increased in size and become vesicular, and some of the oldest of them had reached their destined diameter, and had slight central depressions. Three or four of the pocks which were near together had united and formed one.

In the Portrait in plate III. the same pocks are again represented, but at a still more advanced age. The painting, of which this portrait is a copy, was made on the *sixth day* from the date of the first eruption and just forty-eight hours after the painting for the portrait in plate II. was executed. The progress, therefore, which the eruption had made, and the alteration which it had undergone, during this period, is exhibited in this print. The pocks which first broke out, and were at this time about six days old, had become perfect pustules, and in a few instances, had dryish and brownish specks in their centre; and those which last appeared were beginning to assume a purulent character, whilst those of intermediate ages were in different stages of maturation.

In the Portrait in plate IV. the same eruption is delineated, as it appeared on the *eighth day* after it began to break out, and two days after the third

painting of it was made. The pocks at this period were all in a state of suppuration; and some of the oldest of them had begun to show signs of desiccation.

In these four plates the regular progress of the small pox eruption, for eight days, and the various appearances which it assumed during its papular, vesicular and suppurative stages, and even till it began to desiccate, are correctly delineated and may be easily studied.

After the eighth day of the eruption, the pustules pursued their march till the tenth, when the child died. All the common symptoms, which are mentioned in the succeeding description of the natural distinct small pox, as peculiar to the disease, attended this child's eruption. The face, and the eruptive surface generally became inflamed and swollen, as the pocks increased in number, and pursued their course towards maturity, and the child suffered much from soreness in the throat and bowels, and from diarrhœa. The fever subsided on the breaking out of the eruption, but it reappeared again, with great force on the commencement of the suppurative stage, and raged with increased intensity till the little patient died. During this time the brain was much oppressed, and the day previous to the child's death a considerable hemorrhage took place from the nose.

The eruption, as will be seen by the print, had a slight confluent tendency, and about the sixth or seventh day the pocks became somewhat flattened in consequence of an absorption of their contents. On post-mortem examination the mucous membranes of the fauces, œsophagus and stomach, were found to be considerably inflamed, and numerous whitish specks were discovered in them, which were supposed to have been the remains of pustules which had invaded these organs. The lungs and brain were gorged with blood, and some effusion had taken place in the ventricles of the last named organ.

In the Figures under the portraits in plates I. and II. is a representation of the confluent Small Pox eruption as it appeared at different periods on

the face and hand of a girl aged fourteen. The pocks which are delineated in the *lower right hand corner* of each of these figures, were situated on the face, and were painted on the *second, fourth, sixth,* and *ninth day* after they broke out. Those which are represented in the other parts of these figures, existed on the hand of the same patient, and were painted on the *fifth, seventh, ninth,* and *eleventh day* of their age.

In the Figures under the portraits in plates III. and IV. is a representation of the Inoculated Small Pox, during its progressive stages.

The pustules of *Insertion* with a secondary *local eruption* are represented in figures 1, 2, 3, plate III., at three different periods. The *general eruption,* during the first nine days of its course, is represented in figures 1, 2, 3, 4 and 5, plate IV.

In August 1826, a number of boys, between the ages of 12 and 16 years, were inoculated in four places with small pox virus, by Dr. Biett, one of the physicians of the St. Louis Hospital of Paris. A part of these lads had been vaccinated, and part had never been protected from the small pox. In those who had been vaccinated, the insertion of the variolous virus had no other effect than to produce a slight inflammation, for two or three days, at the points where the matter was introduced. Those who had never been protected were affected differently and contracted the variolous disease. The pustules produced in the arm by the insertion of the virus, assumed during every stage of their progress, the appearances and characters mentioned in the description of the disease, as peculiar to them.

On the *ninth day* after the operation of inoculation was performed, a painting of the variolous tumour was made; at this period the arm was considerably swollen and highly inflamed; the pustules of *insertion* were surrounded by a secondary eruption which had broken out the preceding day, and the tumour presented the exact appearance that is represented in figure 1, plate III. The original pustules, or those of insertion, varied in form and size, having irregular and angulated borders, and measuring from two to four

lines in diameter. The secondary local pustules were numerous and very small. The eruption represented in this figure existed on a boy fourteen years of age. That represented in the other two figures of the same plate, existed on a boy aged sixteen. The eruption on both patients exhibited exactly the same characters. The painting for figure 2, was made on the *eleventh day*, and that for figure 3, on the *thirteenth day* after the inoculation.

On the *eighth day* from the operation, the *general eruption* took place, the character and progress of which is delineated in the figures under the portrait in plate IV. The pustules, delineated in these figures, existed on the face and hand of the boy from whom the drawing for figure 1, plate III. was painted. The pustules, as represented in these figures, were painted on the *second*, *third*, *fourth*, *sixth*, and *ninth* day from their appearance. The three pustules, represented in the lower portion of these figures, existed on the face; the other four, in the upper part of the figures, existed on the hand. The pustules on the face, as will be observed by the prints, ran their course rather more rapidly than those on the extremities.

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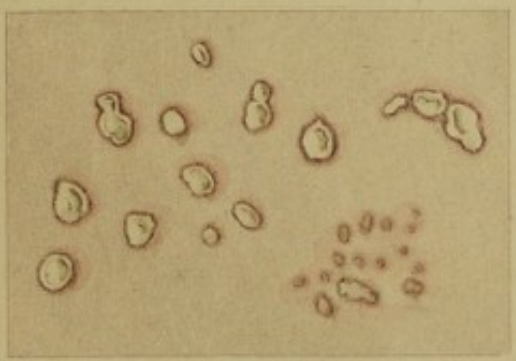

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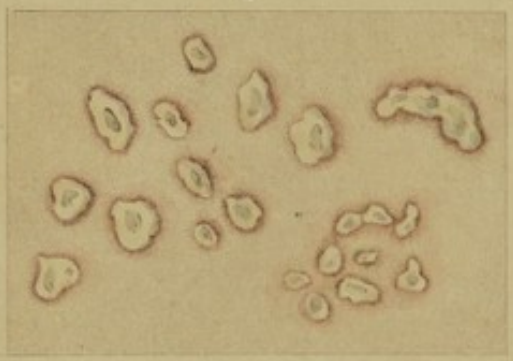

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DESCRIPTION AND REPRESENTATION

OF THE

DISTINCT SMALL POX.

The small pox, in its natural and unmodified form, is distinguished by four well marked periods ; those of invasion, of eruption, of suppuration and of desiccation.

Period of invasion.—This generally commences in the afternoon, sometimes, but more rarely in the morning, and occupies about three days and a half, when the characteristic marks of the second stage begin to manifest themselves.

It is most commonly announced at first, by an unusual degree of lassitude, languor and restlessness ; by frequent acts of gaping and stretching, and by a petulant and sullen disposition, which are accompanied, or soon followed, by chilliness and shivering and the usual symptoms of a cold stage. Towards evening these symptoms are succeeded by a heat more or less violent, by severe headach, by pain just under the scrobiculis cordis, which is greatly increased by pressure ; by a loss of appetite, by nausea and a disposition to vomit and even vomiting. During the following evening and night, children, especially, manifest a great disposition to sleep, which is usually prolonged, and are troubled with dreams and frequent and sudden startings from their slumbers, with now and then a horripilation or creeping chilliness passing over the surface, which terminate in a well marked shivering or ague fit. This is soon followed by heat, flushings of the face, sensations of weight in the head, more particularly in the occipital portion of it, by pains in the

neck and back, and by long and continued pains in the loins, which gradually and successively extend to the trunk, to the upper and lower extremities and to the joints.

Children at this epoch appear very dull, drowsy and stupid, frequently grinding their teeth during sleep, and are often attacked with spasms and epileptic fits ; whilst adults are troubled with watchfulness, profuse perspiration and a feverish dryness of the mouth and fauces, which is attended with great thirst, and a great desire for acid drinks. At this period, patients are generally tormented with severe burning sensations in the stomach and œsophagus, and with a considerable soreness in the throat, attended with a hoarseness of voice. All of the above named symptoms abate somewhat in their severity each morning ; this abatement, however, is but temporary ; for a new and a more severe ague fit comes on toward evening, and is followed by a more intense heat and strongly marked fever. The circulating system, during all this time, is commonly much disturbed ; the pulse is more frequent from the commencement, but is rather soft and is uniform in its action. The digestive organs are more or less affected ; the tongue, particularly in its middle and posterior portion, is covered with a whitish, mucous coat, and is unusually red at its point and edges. The stomach is very irritable and rejects the lightest kind of food ; the bowels of adult patients are usually quite costive, while children, on the contrary, are troubled with loosness and diarrhœa. The urine, soon after it is ejected, and as it becomes cool, deposits an ash-coloured sediment. A peculiar odour, at this time, often arises from the perspired matter of adults and from the breath of infants and children, and diffuses itself throughout the room, so that it is readily recognised by the observer, on entering the door. As the second stage of the disease, or that of eruption, approaches, the symptoms become more alarming, the fever increases in violence, and the pains in the head, back, loins and joints are more insupportable. A troublesome itching of the nose is frequently experienced, the eyes look red and shining, and are sometimes suffused with tears ; the lining membrane of the mouth and fauces is of a

bright red colour, and is considerably swollen ; the gums and face become tumefied ; hemorrhage from the nose not unfrequently takes place in children and in adult males, and menstruation in females sometimes occurs before the accustomed period. The night of the third day, or that immediately preceding the breaking out of the eruption, is passed with great uneasiness from the increase of fever and of heat ; a prickling sensation is felt over the whole body, and the cutaneous surface becomes tense, red, and shining. The abdomen, at this advanced period, is more painful and sensible to the touch ; the throat is very sore and dry, and a dry cough, attended with frequent and laboured respiration, affects the patient ; and these severe symptoms are soon followed by the appearance of the eruption, which happens, generally, on the morning of the fourth day, or about eighty hours from the first invasive symptoms.

In patients possessing a sanguine temperament, and more particularly in women and children, a roseolous efflorescence sometimes occurs, previous to the breaking out of the eruption. This efflorescence occasionally shows itself during the second day of the eruptive fever, and extends widely over the body, commencing first on the face and successively invading the chest, trunk and extremities. But it more generally happens late in this stage of the disease, and only a few hours antecedent to the appearance of the eruption. The parts invaded by this rash, are generally elevated above the adjoining surface, and are smooth and shining. This efflorescence, the characters of which are well represented on the back part of the hand, plate I. has been often taken for the measles, and in some cases it resembles that disease so nearly, that even the most experienced practitioners are apt to confound them.

Period of eruption.—As this period approaches, the patient, particularly if the eruption is to be copious, experiences a sensation of distention about the head, face, eyes, and mouth, and frequently imagines that the whole cutaneous surface is greatly swollen. Towards the end of the third day, or more commonly on the morning of the fourth, and after a series of symp-

toms such as have been described, the eruption begins to appear. It usually breaks out first on the lips, and round the alæ of the nose; then on the cheeks and chin, round the eyes, on the forehead and near the hairy scalp; and successively on the neck, chest, trunk, arms and legs, and lastly on the hands and feet. This order of invasion, however, is not always constant; and it is not unfrequently the case, that the eruption appears on the trunk, and even on the extremities, before it invades the face. The eruption commences in the form of small, red, circular points or papulæ, which for the first few hours, are but few in number, and are widely dispersed. These inflamed spots or papulæ, however, multiply rapidly, and in the course of two or three days, complete their number, having by this time invaded the different regions of the cutaneous surface, and sometimes also, the mucous membranes of the mouth, pharynx and eyelids, and those of the prepuce and external labia of the vagina. The face is the region in which the eruption is usually the most copious, and in which it is usually the soonest completed. The pimples are generally quite numerous on the face, and some have even assumed a vesicular form on this region, while they are but just completed, or are still appearing on the extremities. As the eruption frequently continues to break out on the face during the whole of the eruptive period, we may, at the end of two days, see the pocks on this region varying in age, form and appearance, from the moment they exhibit themselves in minute papulæ or red points, until the time they become vesicular. This was the case in the individual disease which is represented in the portrait contained in plate I. This particular epoch was, therefore, chosen for painting the eruption, as its characters from the moment it first appeared, till it assumed a vesicular form, could be easily and correctly represented. The small, red, circular points or papulæ, in which form the variolous eruption first presents itself, and which are faithfully represented at *a*, *a*, on the cheek of the portrait just referred to, are not prominent above the surface in which they are seen, but by passing the finger over them, they can be easily and distinctly felt. They are of the

size of a pin's head, are round, hard, moveable and rolling under the finger, and are evidently situated in the substance of the skin. These minute, isolated, tubercular tumours, increase in diameter, and in prominency, advance upon the surface, become slightly elevated above it, and gradually rise into distinct pimples, such as are represented at *b*, *b*, on the upper lip of the portrait just mentioned. In the course of the first day, or by the time they are twenty-four hours old, they become rather more globular in form, have a regularly formed ring of inflammation at their base, and assume the usual appearances of rising pustules. Those, at this stage, are well characterised in the representations at *c*, on the nose of the same portrait. They now go on increasing in breadth and elevation, and, on the commencement of the second day, present light, transparent specks at their summits, and assume the appearances exhibited in the delineations at *d*, *d*, on the nose and cheek of the same portrait. At the first inspection these shining, semi-pellucid specks appear as if they were the effects merely of the distention of their cuticular covering caused by the rising pimple pressing against it, and thus giving to it a polished and glistening appearance; but they are, in fact, the seat of rising vesicles, for in the course of the second day, but sometimes not until the third, the eruption loses its papular character, and becomes visibly and truly vesicular. The vesicles are at this period, however, confined to the tops of the pimples, and contain a drop of limpid secretion. The delineations at *e*, *e*, near the chin, and on the upper part of the face of the portrait, in plate I. represent very perfectly the character of the eruption at this stage. During the eruptive stage, the pimples are painful when pressed, and when they have reached their vesicular state, they seem to be planted upon well defined tubercular bases which are perfectly distinguishable by the touch. The inflammation attending the disease, is of the phlegmonous kind, and the redness both of the pimples and skin subsides and disappears under the finger, and on stretching the surface; but the hardness and projection of the eruption continue to be felt and seen. The true seat and structure of the eruption during the eruptive period, have been accu-

rately ascertained by dissection. This has established, what indeed the sense of touch and other methods of examination had indicated, that the small pox pustule is originally formed in the substance of the cutis. The little tubercles soon after they are formed, are discovered, on dissection, to be located in the reticular tissue of the true skin, occupying, as it were, little cells expressly formed for them. They resemble regularly formed bulbs, are reddish exteriorly, of an ash colour interiorly and are evidently cellular. If on the second or third day after their appearance, these bulbous tubercles are divided by incision, and examined by means of a magnifying lens, a minute quantity of a serous fluid may be discovered in them retained by small, thin walls or filamentous partitions, which have not, however, as yet the appearance of a regular and symmetrical structure. The febrile symptoms on, and during the appearance of the eruption, subside; and when the eruptive process is completed, the patient, particularly if it be a child, is frequently relieved from all the distress and uneasiness which attend the fever. The pains of the head, back and loins, and the increased heat of the system are much diminished, and occasionally entirely vanish. The eyes and tongue regain in some measure their natural complexion, the pulse becomes more regular, and the organs of digestion and of secretion, resume in a degree their natural and healthy functions. Patients usually complain of soreness in the throat during the whole time occupied by the period of eruption, and this increases in degree as the pustules increase in size and number. As the eruptive process goes on, the regions which are successively invaded by the pustules, gradually swell and redden; and in grown persons the eruption is very frequently attended by a profuse and constant perspiration. After the breaking out of the eruption, the pocks, on whatever part of the body they may exist, all pursue the same march, varying a trifle perhaps in appearance in different regions, according as the texture of the skin differs in thickness and vascularity, and by the time the pocks which first appeared, become vesicular, those which succeed them are in different states of progress, and the eruption consequently presents a variegated and multiform

appearance, such as is represented in plate I. The pimples, after having passed into the vesicular form, as already described, and represented, increase in diameter and elevation, and by the fourth day the tubercles seem to have emerged entirely from the substance of the skin, and are quite prominent above and situated, as it were, upon its surface. Their whole superficies is now converted into a vesicle, which fills and assumes a rounded or hemispherical form, and soon presents a slight depression in the centre, as is shown in the representations on the cheek of the portrait in plate II. This depression differs in degree in different pustules. In some it is quite evident, whilst in others it is hardly perceptible, or does not exist. It is usually considerably deep in the eruption on the face, when that on the extremities remains rounded and globular. When the depression does exist it is "produced by an adhesion of the cuticular membranes to the inflamed cutis, in consequence of the effusion of coagulable lymph; which also forms a cyst to confine the matter, and thickens the rete mucosum and cuticle." The pustules which are now of a pearl or ivory colour, are surrounded by a red circle, and measure from one to two lines in diameter. They are tender on pressure, and are still distinguished by hard tubercular bases. They subside, but do not disappear, on pressure, or by distending the parts on which they exist. Their bases, however, communicate a hardness and resistance to the touch, whilst their superficies are comparatively soft and yielding. These peculiarities, however, are not common to all of the pustules at this epoch; some of them more readily give way under pressure, and are more yielding and elastic than others, owing probably in part to a greater comparative quantity of secreted fluid which distends them, and to some difference in the compactness of the texture in which they are situated. Dissection of the pustules, on the fifth or sixth day of their age, demonstrates that their structure is cellular, and that the cells are filled at this period of their progress with a diaphanous, viscous secretion, and that they are separated from each other by thin partitions, which converge to a central point. This structure is easily recognised in the superior portion of

the pustule, by dividing it by a transverse incision from above downwards. The structure of the lower or deep seated portion of it is more dense and compact, but is still cellular, and is of a deeper colour than the superior portion, and contains a little fluid. In puncturing the pustules at this time, the secreted matter will usually flow out at once, which shows that although it is contained in cells, yet these are not distinct from each other, but that there is a free opening and communication among them. The general appearance of the eruption on the fourth day, or at the period when the pimples which are latest in appearing, begin to assume a vesicular form, is well represented in plate II. The pustules, as represented in the plate, vary considerably in age, size, and general appearance. When about five days old, they are hemispherical in shape, are bounded by a red circle, and their fluid contents gradually assume an opaque and turbid appearance. Whilst these changes are taking place in the pustules, which are the first to break out, those which succeed them gradually pass through the same changes, and the parts which are thickly studded with them inflame and swell and frequently acquire a damask rose colour. As the pustules increase in size and become filled with matter, the intermediate spaces inflame and become infiltrated with effused lymph, which occasions some general swelling of the cutaneous surface. The eyelids are the parts which first begin to swell, and they frequently swell to so great an extent as to close the eyes and produce temporary blindness. In some instances they are so much infiltrated and distended that they resemble shining inflated bladders drawn over the eyes. The other parts of the face soon swell in proportion, and present a polished and bright red surface. The swelling of the face is sometimes so extensive, that its general outlines are completely destroyed, and the peculiar features of the individual are no longer to be recognised. Immediately after the face, the hands, the fingers, the body, and the feet swell in proportion to the number of the pocks which are on them. The whole head is at the same time tender and painful, and it is with much suffering that the patient raises or moves it.

Period of suppuration.—Having arrived to their destined size, which they acquire generally in five or six days from the date of their first appearance, the pustules begin to undergo and to manifest considerable changes. Their limpid secretion about this period begins to lose its transparency, and to become by degrees more and more clouded, opaque and consistent, and in the space of two or three days it is converted into pus. This conversion of the serous secretion into pus, is accompanied by corresponding changes in the external appearance and internal organization of the pustules. As soon as the suppurative process takes place, the surfaces of the pustules begin to lose their smooth and semi-transparent aspect, and to grow rough and whitish. This is the first sign of commencing suppuration. As maturation proceeds, the complexion of the pustules continues to grow more opaque and to assume successively a milky and light straw or cream colour. During this process small, well defined, circular specks, darker than the rest of the surface, appear in the middle of most of the pustules, which are well characterised in those depicted on the eyelid, on the outer and lower part of the face and on the hand of the portrait contained in plate III. These little specks on their first formation, are rendered very apparent by means of a magnifying lens, and the cuticle which covers them appears somewhat dry, and slightly scaly. They increase in size from the centre to the circumference, until the whole superficies of the pustules assume in a measure the same opaque and purulent appearance, and until desiccation actually commences. Whilst these changes are taking place in the secreted fluid, and in the external characters of the pustules, their internal cellular structure gradually gives way and becomes dissolved, so that the matter which heretofore had been contained in many little apartments, now occupies a single cavity and the pustule is therefore converted into a regular cyst. This cyst can, by a skilful hand, be readily dissected from its connexions without being broken. It is found to sink deep into the substance of the cutis, and to occupy a considerable portion of its thickness. At this period of their progress the pustules cease to communicate that resistance to the touch which

distinguishes them during their vesicular state, and instead of feeling firm and hard, they are now comparatively soft and the matter in them evidently fluctuates under the pressure of the finger. Whilst these local changes are taking place, and during this period of the disease, which is by far the most dangerous, a number of general and constitutional symptoms arise. The fever which subsided on the breaking out of the eruption, reappears at the commencement of suppuration, and rages with greater or less violence till desiccation takes place. It is announced by chills, which are succeeded by heat, headach, quick and hard pulse, thirst, furred tongue, by a disposition to sleep, coma, and sometimes by delirium. The parts which are the most thickly studded by the pustules, are commonly the most swollen, inflamed and painful. The hands and feet of children usually swell a good deal, even when there are but few pustules on them, and adults are almost constantly troubled with a free, and frequently a profuse salivation. The secretion of saliva is attended with hoarseness and pain, and with a peculiar and very disagreeable odour. The urine is commonly high coloured and muddy, and the dejections are frequent and liquid in children, whilst in adults they are often suppressed, and hard. The general symptoms continue with varied severity, until the pustules on the different regions of the body become entirely maturated, and begin to dry up. The pustules on the face, or those which first break out, are the first in which suppuration commences and is soonest completed. Those on the extremities are the last to suppurate. As the pustules on the different regions, and even on the same parts of the body, do not pass into their suppurative stage all at the same moment, but at different times and in succession, the eruption consequently exhibits a variegated appearance at the time that the oldest pustules are in a state of complete suppuration. The general appearance of the eruption at this period, or on the eighth or ninth day from the first eruptive effort, and on the eleventh or twelfth day of the disease, is well delineated in the portrait in plate IV.

Period of desiccation.—The pustules having filled, and ripened into little abscesses, the distended coverings of some of them frequently burst and

permit a portion of their fluid contents to ooze out. The matter which escapes, coming in contact with the air, soon dries, and little dark crusts are speedily formed on the tops of the pustules. These crusts, which are at first very thin, and of a light yellow hue, increase in size and assume a brown orange colour; they resemble little scales, many of which fall off and are replaced by new ones. The pustules which remain unbroken become slightly contracted, and their fluid gradually concretes into a solid form. Both the broken and unbroken pustules now grow dry, hard and brown. After a few days the crusts and the dried and hardened pustules become detached and fall off, leaving scars in the skin of considerable depth. These scars are at first red, but soon change to a dark purple colour, which they retain for many weeks. They at length, however, either disappear entirely, or else become more apparent, sinking deeper as it were into the cutis, and exhibit smooth and polished surfaces during the remainder of life. Desiccation, as well as suppuration, first commences in the pustules on the face, and then in those on the neck and other parts of the body, following the order in which the eruption broke out. The pustules on the feet and hands are, therefore, the last to dry up and fall off, and are usually two or three days later in desiccating and becoming detached than those on the face and body. As soon as desiccation commences in the pustules the febrile symptoms abate, and vanish as the process of scabbing proceeds. The areolæ surrounding the pustules and the swelling and turgescence of the parts on which they exist, decline and soon disappear. The scabs fall from the face from the twelfth to the fifteenth day after the appearance of the eruption, and from the fifteenth to the eighteenth day from the commencement of the febrile attack. In the course of two or three days more, the scabs on the other parts of the body fall off. Such are the usual symptoms and appearances of the small pox in its distinct form. These, however, are not always uniform in their character. The fever and constitutional affection are sometimes much milder, and sometimes considerably more severe than has been described. The pustules are only few, not exceeding ten or a

dozen in number in some cases, whilst in others they cover every part of the body, are coherent and even piled upon each other, as was the case in the eruption represented in figures A, and A, under the portraits, in plates XI. and XII. There is a considerable variety also in the size of the pustules. They differ in this respect from the diameter of a common buck shot to that of a good sized pea, and are invariably smaller and less prominent on the face than on the extremities of the same individual, see figures A, and A, last referred to. Sometimes also the pustules contain but little fluid, are firm and resemble warts. These suppurate imperfectly, and usually desiccate without being ruptured, and have been termed by authors *horn* or *crystalline pocks*.

EXPLANATION OF PLATE V.

In the portrait in this plate, is a delineation of the Confluent Small Pox eruption, as it appeared on the *tenth day* after it broke out on the face and hand of a female patient, who was at the time of the disease in the small pox ward of La Pitié Hospital of Paris. She was twenty-five years of age, and had never been protected either by the cow pox or the variolous disease.

She experienced all the common symptoms which generally attend this form of variola, and during the day on which the painting of the disease was executed, she exhibited, in her features, the appearances of great anxiety and distress. The general swelling of the face, however, was not so great, as often takes place in cases of the distinct variola, and the disease was one of moderate severity. At the time the portrait was painted, some of the pustules about the nose, mouth and chin, had began to dry up, and look scaly. After the tenth day desiccation continued to progress, and on the *fourteenth day*, the eruption on the nose, and the other parts of the face, presented the appearance represented in figure A, under the portrait in this plate. From this date, the disease pursued its usual course, and the patient, after five weeks of illness, was able to leave the ward, but her features were much deformed by the extensive ulcerations caused by the eruption.

DESCRIPTION AND REPRESENTATION

OF THE

CONFLUENT SMALL POX.

The confluent, like the distinct form of small pox, is distinguished by four successive periods; those of invasion, of eruption, of suppuration, and of desiccation.

Period of invasion.—The invasion of the confluent small pox is marked by the same general symptoms as that of the distinct variola already described. The symptoms, however, are usually much more violent and succeed each other with greater rapidity. The fever, in this form of the disease, partakes of a typhous type, and comes on more suddenly, and rages with more force than in the distinct variety; the pulse is more frequent and contracted, the pains in the head, back and loins are more intense and distressing; the throat is more sore, the stomach and bowels are more tender and painful on pressure, and nausea and vomiting are usually more frequent and obstinate. As the time approaches for the eruption to appear, all the symptoms become more aggravated and rage with redoubled force; the brain is more oppressed, the eyes are more sensible to light, the soreness in the throat is considerably augmented, the lungs are more crowded, and the respiration and articulation are performed with more labour and difficulty. The precursory symptoms, indeed, are sometimes so sudden in their developement, and the pains in the head and the gastric distress are so great as to occasion convulsions and delirium, and, if not immediately counteracted, even to destroy life before the eruption breaks out.

Period of eruption.—The eruption, in confluent variola, often breaks out on the second day of the fever, but more generally in the early part of the third, and always a number of hours sooner than in the discrete form of the disease. It is more commonly preceded or accompanied by an erysipelatous efflorescence, and by a greater feeling of distention of the face and cutaneous surface generally, than when it assumes the distinct form. The efflorescence appears suddenly, is attended with considerable heat and perspiration in adults, and diarrhœa in children, and in the course of a few hours invades the different regions of the body. The eruption presents itself in innumerable pimples, or inflamed papular points closely situated, and appears almost simultaneously in every part of the body. In this respect particularly, the confluent differs from the distinct small pox. The pimples frequently appear in clusters, and are sometimes so close together that their bases are in juxtaposition and touch each other. They are always more numerous on the face than on the trunk and extremities, and very frequently invade the mucous membranes of the internal cavities. On their first appearance, and indeed for the first twenty-four hours of their existence, they do not differ materially from those of the distinct kind. They occupy the same texture, have the same organic relations, and possess the same anatomical structure. They differ from them only in being smaller, less prominent, and of a paler colour. In the course of the second day of its existence, and always sooner than in the distinct species, the eruption becomes papulo-vesicular. The vesicles are first formed on the tops of the pimples, and are soon filled with a limpid serum. In a short time they enlarge and cover the whole superficies of the pocks, they are irregular in figure and are flat, seldom rising but little above the common surface. The delineations in the lower right hand corner of figure 1, plate I. are good representations of the pustules as they appear on the face when two days old. On the extremities the pocks are more tardy in becoming vesicular and are more regularly circumscribed. From the time the pimples become vesicular they increase in breadth rapidly, and where they are in thronging num-

bers and their bases are coherent from the beginning, they soon coalesce and run together. As the virus continues to be secreted in them, their adjacent borders approach each other ; the cuticular coverings of the vesicles become more distended, and their edges are by degrees detached from the skin beneath, and the intermediate cuticle, covering the spaces between the pustules, rises up and the whole eruptive patch frequently resembles a broad and slightly distended blister. The bases of the pustules are still hard and may be distinctly felt, notwithstanding the pocks have coalesced so as to form one common vesicle. Where they are more scattered, and do not run together, they never rise up into a rounded or spheroidal form, like the pustules of the distinct variola, but are flat, flaccid and irregularly circumscribed : see the delineations in figure 1, plate I. which are representations of pustules as they appeared on the hand on the fifth day of their age. The period at which the pustules begin to unite and run into each other, depends upon their number, upon the vascularity of the surface on which they exist, and upon the severity of the constitutional affection. Sometimes they are confluent from the beginning ; at others they do not become so until the third, fourth or fifth day, or not until after maturation commences. The liquor continues to be secreted in the pocks from the time they become vesicular, and retains its semitransparent appearance, until maturation begins to take place. From the time the eruption begins to appear, the face and cutaneous surface gradually swell, and by the time the pustules begin to maturate, the eyelids are considerably infiltrated, and the face becomes puffed up as in erysipelas. The mucous membranes of the mouth and fauces become irritated and swollen at the same time, and secrete a thin and watery fluid. The saliva is frequently very copiously formed, and at this period is easily expectorated. As the membranes of the mouth and fauces become affected, the soreness in the throat increases, a dry, hard and painful cough ensues, the voice becomes hoarse and articulation is attended with difficulty. The fever, on the breaking out of the eruption, usually suffers some slight remission, but not in so great a degree, nor does it ever go entirely off, as in the

distinct small pox. In some severe cases, indeed, the febrile symptoms, instead of subsiding, increase during the eruptive period, and become more violent and dangerous. The cerebral and gastric affections commonly experience some partial alleviation, but the brain still remains oppressed, and more or less comatose, and the digestive organs continue much disordered. The tongue is red, swollen and thickly coated; the pulse remains small, quick and hard; the bowels are either quite costive, and the cutaneous surface is moistened by a free perspiration, or else the bowels are relaxed and the skin is hot and dry.

Period of suppuration.—In four or five days after the eruption breaks out, the continuous detached pellicle covering it, begins to lose its opaque, vesicular appearance, and assumes a whitish or silvery colour, which gradually deepens in tint, until about the eighth day, or until desiccation actually commences. The pustules in confluent variola, however, do not suppurate so regularly and perfectly, as in the distinct small pox. The virus secreted in them gradually changes from a semipellucid to a yellowish or brownish colour, but continues more or less serous and never acquires the deep yellow hue and thick consistence, as in the distinct kind. As the maturating stage advances and the cutaneous swelling increases, the pustules become more distended with the virulent secretion, and the cheeks, forehead and the confluent eruptive patches, present a continuous puffy elevation of a pearly white colour. The pustules on the extremities during the process of maturation are flattened, and frequently exhibit slight depressions and discoloured spots in their centre, see figure 2, plate I, and the virus which they enclose is yellower, thicker and more purulent than in those of the face. The fever, which commonly experiences some remission on the appearance of the eruption, revives and increases in violence during the suppurative stage, and continues considerable, till desiccation is effected and the scabs begin to fall off. From the commencement of the suppurative process, and the revival of the secondary fever, the whole face and the common integuments of the head become more infiltrated and swollen, and by the seventh or eighth day,

the eyelids become so puffed up, and the nose, cheeks and lips so tumid that all the regular features are lost, and the whole face presents one misshapen and disgusting mass. As this general swelling takes place, the patient experiences a very unpleasant sensation of distention, which becomes more intolerable as the maturating stage advances, and he imagines that his face and head exceed by many times their natural dimensions. The eyes are endued with increased sensibility, and a thick and copious secretion issues from the edges of the eyelids, and glues them together. The tongue partakes of the general swelling and nearly fills the mouth, and salivation becomes more free, consistent and viscid. Deglutition and articulation become difficult and painful in consequence of the increased swelling and soreness of the throat, and the voice is rough, hoarse and indistinct. The digestive organs remain disordered, and the diarrhœa in children, and the perspiration in adults continue unabated. The brain often remains oppressed, and the patient is much inclined to sleep.

Period of desiccation.—About the eighth day, the eruption begins to fade, and the continuous pellicle which covers that of the face, assumes, by degrees, a yellowish and polished appearance. As the process of desiccation advances, the pustules break and the virus which escapes soon dries as it comes in contact with the air, and forms dark-brown crusts or scales. Desiccation advances rapidly after it has commenced, and in the course of two or three days the eruption on the chin, nose and lips, is covered by a dark, rough, unbroken scab. The disease as it appears on the face and hands about the *tenth* day when moderately severe, is well delineated in the portrait, in plate V. From this time the pustules on every part of the body continue to dry up, and by the *fourteenth* day, those on the chest and extremities are converted into scales, and the eruption on the face presents the appearance represented in figure A, plate V. At this stage of the malady, the face and every part of the body, where the eruption is confluent, is incased in one continuous scabby covering. This continues to grow drier, harder and darker, and in the course of a few days it separates from

the skin beneath, breaks and falls off in large flakes or scales. The fever, which is usually very severe at the time desiccation commences, begins to subside immediately after, and gradually disappears. The saliva, which is copiously secreted in the early part of this stage of the disease, becomes thicker and more viscid, and about the eleventh day it is frequently so tenacious and adhesive, that it is expectorated with great difficulty. The general swelling of the face now begins to decline, and that of the hands and feet to increase. This is the period of the greatest danger, and the patient, at the time the saliva becomes viscid, frequently passes into a comatose state, and dies in a fit of apoplexy. When the scab begins to separate, the patient experiences an unpleasant tension and prickling sensation in the skin, which renders him uneasy, fretful and peevish. After it is cast off, the surface beneath appears smooth, but is extensively ulcerated and exhales a peculiar and a very fetid odour. Small, furfuraceous scales form, for a day or two, over the ulcerated points, which on healing, leave deep, irregular lines or cicatrices in the skin that often disfigure the face and destroy its expression.

From the description and representation which has been now given of the distinct and confluent small pox, it will be observed that they differ from each other chiefly in the following circumstances : 1st, in the character and duration of the fever ; 2d, in the period at which the eruption breaks out, and in the form and number of the pustules ; 3d, in the state of the virus secreted in the pustules ; and 4th, in the danger of the disease.

DESCRIPTION AND REPRESENTATION

OF THE

INOCULATED SMALL POX.

In cases of successful operation for the communication of the Small Pox by inoculation, the punctures made in the arm by the lancet in introducing the virus become immediately inflamed, and in the course of the first day, or at furthest before the termination of the second, rise up into small red or orange coloured papulæ, which are smooth and hard to the touch and resemble very closely the vaccine pimples on the fourth day after vaccination. Sometimes, however, the little red specks which immediately succeed the operation subside in an hour or two, and no rising or inflammation of the punctures is manifested till the third day. But more generally, and in fact almost uniformly, the inflammation continues from the first, and by the fourth day the pimples acquire the size of millet seeds, have inflamed bases and rounded or conic-shaped summits. During this time an unpleasant prickling or tingling sensation, and a considerable degree of itching and heat is felt at and in the vicinity of the inoculated points.

During the *fourth* and *fifth* days the pimples increase considerably in all their dimensions, and before the commencement of the sixth day they take on the form and character of pustules. A bright circle of inflammation surrounds their bases early on the fourth day, and towards the close of the fifth their surfaces exhibit a whitish, shining and vesicular appearance which is owing to a secretion of transparent fluid that distends them.

On the *sixth day* the pustules are quite prominent and their tops are con-

verted into regular and perfectly formed vesicles. As the vesicles become distended by the continued secretion of virus, the pocks begin to lose their circumscribed figure and to exhibit irregular and angulated margins. Their spherical shaped summits spread out and flatten, and a slight discoloration may often be discovered in their centre. At this epoch the lymphatic vessels, connected with the pustules, become irritated and some degree of pain and stiffness is experienced by the patient along the inside of the arm above the inoculated part and in the axillary glands. The parts on which the pustules exist begin to swell and grow hard, and to present a light crimson and efflorescent appearance.

On the *seventh day* the pustules continue to secrete their peculiar fluid, become broader and more distended, and irregular in form. They begin to lose their smooth and semitransparent appearance and to assume a pearly hue and to exhibit small discoloured depressions in their centre. In the course of this or the following day some general febrile symptoms begin to manifest themselves, such as general lassitude, slight and transient chills with alternate heat, loathing of food, nausea which is sometimes followed by vomiting, pain in the head, back and loins and a disturbed and increased action of the arterial system. During the invasion of these symptoms, the inflammation, swelling and efflorescence which begin to take place round the pustules of insertion about the sixth day, experience a sudden increase and spread rapidly and widely into the adjacent structure. The variolous tumour becomes turgid, hard, and polished in its appearance, and a few miliary pimples of the diameter of a common sized pin's head arise within the boundaries of the inflamed surface and near the original pustules. These *secondary local* pimples become vesicular immediately on their arrival at the surface, and are filled with a liquor resembling in all respects that contained in the parent pustules. They project a little above the inflamed and tumid surface from which they arise, are encircled by an areola of a deeper red than that of the tumour on which they are situated, and are soft and yielding under the finger.

During the *eighth day* the fever and constitutional affection continue and generally increase in severity. The eyes become red, irritable and watery, the eyelids and the face generally become infiltrated and swollen, the lining membrane of the mouth reddens, a thick mucous coat covers the tongue, the throat becomes inflamed and sore, and oftentimes a free perspiration appears over the whole surface of the body. As the symptoms of general irritation increase in severity, the variolous tumour continues to swell, and the inflammation and efflorescence spread out in every direction into the adjacent sound parts. The original pustules, or those of insertion, augment in size, in consequence of the continued secretion of virus in them, and their borders or margins become proportionably more irregular, indented and jagged. From the time the variolous fluid first begins to be secreted until the present period, it is limpid and transparent and has all the common appearances of the vaccine virus. Like that also it immediately loses its fluidity when exposed to the air, and resembles light coloured varnish or gum when dried. About this time, however, and in many instances much earlier, it begins to lose its clear pellucid appearance, and to become slightly opaque.

The secondary local pustules continue to multiply and to fill and increase in size. On this or the succeeding day, and at this stage of the local and constitutional affection, a general eruption begins to break out on different parts of the body. This eruption, like that of the small pox when contracted in the natural way, commonly shows itself first on the face, then on the neck and trunk and lastly on the extremities. It sometimes, however, as occasionally happens in the natural disease, pursues a different order in its invasion, and appears first on the extremities. This was the case in the patient whose disease is represented in the squares which will be referred to in this description. At this epoch, when the febrile disorder is at its height, and the general eruption is appearing, the local inflammation and the swelling and efflorescence of the arm attain to their greatest extent, and in many instances extend half round the limb. The variolous tumour with its eruptions, as it usually appears at this period, or about the *ninth day* from the

date of the inoculation, is well represented in figure 1, plate III. The original pustules or those of insertion, as represented in the figure, are irregular in form, and have angulated and jagged margins. They vary in size and measure from two to four or five lines in diameter. Their fluid contents increase in quantity, grow whitish and purulent, and assume a light straw or cream colour. The pustules are flat and flaccid, rising but little above the inflamed surface of the tumour, and are soft and yielding under pressure. They now resemble little abscesses and are deeply planted in the true skin. The virus, from the time it commences to be secreted, is contained in one single cavity and readily flows out when the pustule is ruptured.

The depressions in the surfaces of the pustules grow darker and deeper, and matter frequently oozes from them which soon concretes into thin scales or crusts. The secondary local pustules oftentimes multiply on this, and even on the following day, so that the tumour is frequently thickly studded with them. Some of the oldest of these have slight depressions in their centre, and all of them are round and regularly circumscribed. As the symptoms which usher in and accompany the general eruption decline, the efflorescence that surrounds the pustules of insertion begins to lose its bright roseolous tint and to decrease a little in breadth; see figure 2, plate III. which represents the local tumour as it usually appears on the *eleventh day* after the operation. The pustules of insertion commonly grow larger, fuller and more irregular until the present period, and their surfaces become drier and more scaly, so that irregular and reddish brown scabs are formed and cover the central portion of them. The secondary local pustules spread out and flatten a little, and their fluid contents grow thicker, yellower and more purulent. From this time the inflammation, swelling and soreness of the arm gradually decline, and about the *thirteenth* or *fourteenth day* the local tumour with its eruptions presents the appearances represented in figure 3, plate III. The size and form of the original pustules during the last named period do not undergo any essential variations, but the pus con-

tained in them grows thicker and yellower, desiccation goes on, and the scabs increase in diameter and solidity, and usually extend over one third or more of their superficies. The secondary local pustules during the same time augment a little in breadth, the pus secreted in them thickens, and small dry specks form on their tops. After the thirteenth or fourteenth day, and as the patient improves in his general health, the swelling and inflammation of the arm subside very rapidly, the pustules of insertion sink and grow flatter, their purulent contents become thicker, yellower and more concreted, so that by the eighteenth or twentieth day from the time the variolous virus was inserted, their surfaces are entirely covered by brown and hardened scabs. The scabs as they grow dry and solid, become thinner and rather brittle, and fall or crumble off by the twenty-fifth or eighth day, leaving deep irregular or angulated depressions in the skin, of from three to four lines in diameter. These depressions or indentations remain a long time of a livid colour, and finally terminate in white and smoothly polished scars which remain permanent through life. Whilst these changes are taking place in the original pustules, the secondary local ones shrink and dry up into thick, rounded and polished scabs, which become detached and fall from the arm a few days sooner than those of the parent pustules. They likewise leave discoloured depressions in the skin. These however, are usually superficial, and instead of remaining indelible through life like those of the original pustules, they disappear in a short time and leave the spots which they occupied smooth and natural.

The general eruption which takes place, as has already been stated, about the eighth or ninth day from the date of the inoculation and after a fever of seventy or eighty hours duration, continues to break out for two or three days and does not differ in its seat, structure, external form or sensible characters from that of natural small pox. Its general course however, is rather more rapid, and the pustules pass through the different stages of suppuration and desiccation rather sooner, and the scabs fall off a few days earlier than in the spontaneous disease. The eruption as it usually appears

upon the face and extremities on the second, third, fourth, sixth and ninth days of its existence, and as it in fact did actually appear on these several days in the patient before alluded to, is well represented in plate IV. figures 1, 2, 3, 4, and 5. It presents itself in the form of slightly inflamed papulæ, becomes vesicular on the second day, figure 1, plate IV. and assumes the regular and characteristic form of pustules on the third or fourth, figure 2, plate IV. About the fifth day, figure 3, plate IV. the pustules exhibit slight central depressions, and the matter contained in them begins to become purulent. On the sixth, figure 4, plate IV. the pustules show marks of commencing desiccation, and about the ninth day, figure 5, plate IV. dark chocolate coloured scabs cover many of them. From the twelfth to the fifteenth day the scabs fall from the face and soon afterwards from the extremities, leaving scars of a livid colour. A few of the scars remain indelible, but most of them become erased after a few weeks, and leave no traces of their ever having existed.

The pustules of the face usually pass through their various stages of vesication, maturation and desiccation rather sooner than those of the extremities, as is exemplified in the figures just referred to, the delineations in the lower half of the figures being representations of pustules which existed on the face, and those in the superior half being copies of pustules which appeared on the hands.

The fever declines on the breaking out of the eruption and generally vanishes by the time it ceases to multiply ; and if it re-appears at all during the suppuration of the pustules, it is usually light and of short duration.

The inoculated small pox is liable, like all other eruptive diseases, to some deviation in its general course and particular stages. The following anomalies have been occasionally observed.

1st. The punctures made by the instrument in performing the operation of inoculation may remain unaltered for eight or ten or more days, and then suddenly inflame, rise into pustules and pass through their course attended by the usual febrile symptoms and the general eruption.

2d. The disease may run its course without being attended by the general eruption, the only pustules which arise being those of insertion, and the secondary miliary ones which spring up around them about the seventh or eighth day.

3d. In some rare cases, no local pustules are produced by the introduction of the variolous virus, still the precursory fever and the general eruption take place, and the disease runs its course perfectly and secures the subject of it from a second attack of the small pox.

4th. The general eruption, like that of the chicken pox, may appear in successive crops and during several successive days. In a case which came under the writer's observation, the pustules appeared successively for six days, so that the daily progress of the eruption for that length of time could at the end of this period be at once distinctly and accurately observed.

5th. The progress of the inoculated small pox may be much more rapid than above described, and the disease may pass through its various stages and be completed in the space of eight or ten days.

6th. Although the inoculated small pox commonly appears in the distinct form, and is mild in its symptoms, yet it is sometimes confluent and attended with great constitutional suffering, and occasionally proves fatal.

EXPLANATION OF PLATES

VI. VII. VIII. IX.

In the Portraits contained in these plates, is represented a case of varioloid or modified variolous eruption of the distinct kind, as it appeared on the *second*, *fourth*, *sixth*, and *tenth* day of its developement. The female who was the subject of this eruption, had been vaccinated when young, and the marks of the vaccination were visible on her arm. The scars were deep and smooth, and were supposed, from their general appearance, to be the results of a spurious disease. On the 9th of May 1826, she experienced some unpleasant chills which were accompanied with slight nausea. These were soon followed by flushes of heat, pains in the head, back and limbs and by considerable, though moderate fever. On the 12th and after three days of illness, a few pimples were discovered on her face and body. These increased in number till the end of the *second day*, when a painting of them was made, of which the engraved portrait in plate VI. is an accurate copy. The pocks were in moderate number, and amounted, perhaps, to two or three hundred. They were more numerous on the face than on the trunk and extremities. The whole which appeared on the face and hand of the patient were sketched, and are represented in the engraving just referred to. They differed in age and consequently varied considerably in size when the drawing of them was taken, as will be seen by consulting the plate. The pimples were papular at first, were hard to the touch and rather painful on pressure, and before the termination of the second day the tops of them became vesicular. As they were converted into vesicles they increased in diameter and became more globular, but did not project far above the com-

mon surface: (see the pock represented on the chin.) On the third day the pocks were all converted into vesicles and were filled with a yellowish kind of serum. On the *fourth day* they had attained to their full size, and the eruption on the face and hand exhibited all the appearances represented in the portrait in plate VII. The bases of the pocks were still surrounded by bright red areolæ, and were hard and tubercular to the finger. The fluid contents of the eruption had grown yellower and more consistent, and the flattened surfaces of some of the pocks had become slightly discoloured. From the fourth day the pocks increased a little in diameter, but diminished proportionably in elevation, and in a few instances they united and ran together. The matter in them continued to grow thicker and more purulent in its character, and their tops, in consequence of the gradual coagulation or concretion of the virus, assumed by degrees a dry and discoloured appearance, and on the *sixth day* the eruption presented the appearances represented in the portrait in plate VIII. The pocks had flattened considerably, and the inflamed areolæ surrounding them had diminished in redness and breadth. From the sixth day desiccation proceeded rapidly, and by the eighth the virus had concreted into a solid mass. In drying, the pocks were formed into reddish brown crusts or scabs, and during this process they gradually became shrivelled and contracted, and the scabs or crusts began to scale or crumble off on the eighth and ninth day, and on the *tenth day* the eruption on the face and hand exhibited the appearances represented in plate IX. At this stage of the disease, most of the scabs had separated and fallen off, and left brown-coloured depressions in the skin. These discoloured depressions remained visible for some time, and were distinguished by a tubercular hardness. They finally however, disappeared and left no traces of the existence of the malady. The patient, through the whole course of the disease, suffered but little and was not, for a single day, confined to her bed. The febrile symptoms subsided on the breaking out of the eruption, and did not afterwards reappear. A swelling of the face and hands took place during maturation, but this went off as soon as desiccation commenced.

In Figure 1, under the portrait in plate VI. is a representation of the Itch. The minute pimples delineated in the central part of the square are representations of the scabies papuliformis, or *rank itch.* In the upper right hand corner of the square these same pimples are represented in profile as magnified by a lens. The larger eruptions in this square are representations of the scabies purulenta, or *pocky itch.* This figure has been introduced in order that the eruption which is delineated in it might be contrasted with the delineations of the variolous eruption, the one being sometimes mistaken for the other.

In Figure 2, in the same plate, is a delineation of the *measles.* This rash has been introduced that its appearance might be compared with that of the roseolous efflorescence, which frequently attends the variolous eruption.

These two figures are copies, the first from a French, and the other from an English publication.

In the Figures 1 and 2, under the portrait in plate VII. is a representation of the *chicken pock eruption,* as it appeared on a child, on the *second* and *fourth* day after it broke out. An engraving of this eruption has been introduced here that its appearance, on the above mentioned days, might be compared with that of the varioloid eruption of the same age, as represented in the portraits in plates VI. and VII.

In Figures 1, 2, 3, and 4, beneath the portraits in plates VIII. and IX. is an engraving of *four varioloid pocks* which appeared on a little girl six years of age. The paintings from which these engraved copies are made, were taken on the *second, fourth, sixth* and *eighth* day of the developement of the eruption. This little girl had been vaccinated when an infant, and the vaccine scars were strongly marked on her left arm. She had been confined to the sick ward in the Hôpital des Enfans Malades of Paris in the summer of 1826, and whilst she was recovering from a slight fever, a girl fourteen years

of age who occupied a bed near to the one she lay in, was taken sick and broke out with the confluent small pox. Just sixteen days from the exposure of the little patient to this case of confluent small pox, about twenty pimples were discovered on different parts of her body. This eruption broke out without any, or with but very little previous illness which would not have been noticed, had it not been succeeded by the eruption. A slight degree of languor, and a little dizziness and pain in the head, attended with a partial loss of appetite, were all the symptoms that were observed. The eruption first showed itself on the upper and inner part of the thigh, and was vesicular when discovered. A few pimples were next seen on the face, trunk and hands, and were papular on their arrival at the surface, but before the termination of the first day their tops were converted into regular vesicles containing a light straw coloured serum. On the *second day*, see figure 1, plate VIII. the pocks had grown larger, flatter and yellower, and were distinguished by inflamed and indurated bases. On the *fourth*, see figure 2, plate VIII. they had gained their full size, and the matter which they contained began to concrete and to dry up. On the *sixth day*, see figure 3, plate IX. the virus had completely dried up, and the surfaces of the pocks were covered with dry and light brown scales. On the *eighth day*, see figure 4, plate IX. these scales or scabs had become harder and of a darker colour and began to crumble off. During the march of the eruption the patient suffered but little and experienced no secondary fever and was as playful and as lively as usual. She remained during all this time in the ward in which she was taken sick, and continued to sleep in the same bed, notwithstanding the one next to it was occupied by the girl who was sick with confluent variola. After the scabs had separated and fallen, purpleish depressions or marks remained in the skin for some days, but these disappeared by degrees and in three weeks every vestige of the pocks had vanished.


1
2


1
2

EXPLANATION OF PLATES

X. XI. XII.

In the Portraits contained in these plates, is represented a case of the *confluent varioloid eruption* as it appeared on the *fourth*, *sixth* and *eighth* day of its developement on a young lady aged twenty years. In the early part of April 1826, she was exposed to the contagion of small pox in consequence of being in the wards of the La Pitié Hospital of Paris, where a number of patients were sick with that disease. She had been vaccinated when a little girl, and bore evident marks of it by having two large and deep scars on the upper part of the left arm. These scars are accurately delineated at A. under the portrait in plate X. One of these scars was regularly formed and had every appearance of having been the result of the perfect cow pox; the other was irregular and oblong in its figure, as is represented in the print, and varied in some other particulars from those which are usually left by the true vaccine vesicles. On the 20th of April this young lady complained of being unwell, and experienced a considerable degree of lassitude, and dull and unpleasant pains in the head, back, and loins. These were accompanied or soon followed by a loss of appetite and by a mild fever. The febrile symptoms continued without much alteration till the 25th, when numerous red, smooth and shining spots appeared on the forehead, cheeks and chin. The eruption appeared in separate clusters and soon invaded the various regions of the body. In the course of the first day many of the little spots were converted into vesicles.

On the morning of the 26th of April, *second day* of the eruption, the red spots on the face had increased in number and were coherent and semi-

confluent. Some of the rising pocks were rounded or conical in form, but the greater part of them were flat and projected but little above the surface of the skin. On the shoulders the eruption appeared in clusters but was not so copious as on the face ; and on the thorax and extremities the pocks were more dispersed and generally distinct. At this period the eruption had become vesicular in all parts of the body, and the vesicles were moderately distended with a clear limpid fluid. All the febrile symptoms subsided from the moment the eruption broke out, and the patient was free from all pain, and with the exception of a slight diarrhœa, from all derangement of the functions.

On the 27th of April, *third day* of the eruption, the pocks on the face became more confluent, and most of them had broad and flattened surfaces. The tongue and pharynx were unusually red, and were covered by little red miliary points. Deglutition became rather painful, and the patient complained of a soreness in the throat, and experienced a slight headach, increase of heat, and of thirst. On the thorax and extremities, the pocks had increased in number, and some were just making their appearance. They existed in large numbers on the posterior surface of the fore-arm, and round the elbow and knee joints, and on the upper and inner parts of the thighs they were clustered together, and were as large and nearly as numerous as on the last named regions.

On the 28th of April, *fourth day* of the eruption, the disease as it exhibited itself on the face and hands presented all the appearances represented in the portrait in plate X. The pocks, as delineated in the plate, varied in size and figure, existed in groups, were filled with a thin azure coloured fluid, and were flat and destitute of a central depression ; they were more confluent on the cheeks than on the forehead and chin, and were generally distinct, though irregular in figure, on the body and extremities. On the sides of the thorax there was hardly a pimple to be seen, whilst on the anterior and posterior part of this cavity the pocks were very thick. Where the eruption was most copious and confluent as on the face, the skin was

a little inflamed and swollen, but the patient was quite free from the pain and febrile symptoms which she experienced the preceding day.

On the 29th of April, *fifth day* of the eruption, the pocks continued of the same size, and the fluid virus which they contained became more turbid, and began to assume a yellowish and sero-purulent appearance. The tops of some of the pustules had burst and the fluid had oozed out and dried into yellow gum-like scales. As maturation advanced, the face and other parts immediately occupied by the eruption, became a little more inflamed and swollen; and the patient was inclined to be watchful and restless during the preceding night, and experienced some headach and febrile excitement during the day.

On the 30th of April, *sixth day* of the eruption, the disease presented the appearances represented in the portrait in plate XI. The thin coverings of most of the pocks had given way and permitted the fluid to pass out. The virus soon dried in coming in contact with the air, and the tops of the pustules were converted into thin, brownish and glutinous scales. The efflorescence of the eruptive surface had partially subsided, and the slight indisposition and feverish excitement which the patient experienced on the fifth, had on this day entirely ceased.

On the 1st of May, *seventh day* of the eruption, desiccation had taken place in all the pocks, and the scabs had become darker, drier and harder, and the patient enjoyed her usual appetite and rest.

On the 2d of May, *eighth day* of the eruption, the scabs had fallen from most of the pustules of the face and trunk, but still adhered to those on the extremities. The eruption as it appeared on the face and hand on this day is accurately delineated in the portrait in plate XII. The inflammation and swelling of the eruptive surface had entirely subsided, and the patient was in the enjoyment of her accustomed health. In the course of the two succeeding days, or the *ninth* and *tenth day* from the time the eruption first broke out, the scabs had fallen from every part of the body, and their separation was followed by tubercular bluish elevations, such as are depicted in

the last mentioned portrait, which remained visible and hard for a number of weeks, but finally disappeared, leaving no scars in the skin.

In the Figures A. A. under the portrait, in plates XI. and XII. is contained an accurate copy of an eruption of the natural small pox as it appeared on the hand and round the eye of a labourer, on the *seventh day* after it broke out. The pustules were very numerous and were coherent and even piled upon each other, but were not confluent, and had passed into a state of suppuration. They were perfectly round, and varied in size in the different regions on which they existed. They were much larger and more globular on the hand than round the eye, as represented in the figures. On the hands and feet, the pustules were of the tubercular or warty kind, and differed from those of the face and trunk, and from the more common eruption, in being more compact, harder and less prone to suppuration, Every part of the body of this patient was nearly as thickly studded with the pustules, as the regions which are here represented, and the eyes even were invaded by the eruption, and the sight of one of them as shown in figure A. plate XII. was destroyed by a pustule which appeared over the pupil.

A

DESCRIPTION AND REPRESENTATION

OF THE

VARIOLOID DISEASE.

The disease which variolous poison occasionally gives rise to in persons who have had the small pox or the cow pox, and which is now generally known by the term varioloid or modified small pox, commences with a fever of an inflammatory kind which lasts for about three days and declines on the appearance of the eruption. The febrile symptoms and the constitutional affection resemble in their general character those which precede the eruption in the natural small pox. They are usually, however, much milder, and are less constant in the term of their duration. The eruption of which the fever is the precursor, appears as in the unmodified disease, in the form of small inflamed spots, and breaks out rather suddenly, sometimes on the face, and sometimes on the body or extremities first, following no order of succession in this respect. During the first day or two, these inflamed spots increase rapidly in diameter, are perceptibly hard to the finger, and resemble in every respect those of the true unmitigated small pox of the same age. By the second day they become more distinct and elevated above the surface, and have rounded or conical summits and hard inflamed bases. They are usually encircled by irregularly formed areolæ, and many of them exhibit small vesicles at their centre. The eruption as it commonly appears on the *second day* is well delineated in the portrait in plate VI. As early as the *third day* the pocks are all become vesicular, and lose in some measure their pointed or conical form. If the vesicles be now punctured and

pressed, the fluid passes out leaving their bases still hard and elevated. On this and the following day the pocks usually acquire their full dimensions and the fluid which distends them gradually loses its limpidness and becomes opaque and sero-purulent. They frequently present discoloured depressions in their centre, and a few of their number, even at this early period, often exhibit signs of commencing desiccation. The eruption as it more commonly appears on the *fourth day* of its progress is delineated in the portrait in plate VII. By the *fifth day* the virus which is secreted in the pocks begins to coagulate and concrete, and small thin amber-coloured scales are formed upon their surfaces. As early as the *sixth day* desiccation is considerably advanced and the pocks shrivel and grow flat in proportion as the matter which they contain dries and hardens. The crimson coloured areolæ disappear on the commencement of desiccation and leave livid marks in the skin. The appearance which the eruption usually exhibits on the *sixth day* is well delineated in the portrait in plate VIII. After this period the pocks, by degrees, become contracted and converted into thin, dry, reddish-brown crusts. These are hard and shining and adhere for some time to the skin. As early as the *ninth* or *tenth day* the scabs begin to grow loose, crumble and fall off: see the representations in the portrait on plate IX. The separation of the scabs is usually followed by tubercular elevations on the spots which they occupied; these have a reddish-gray appearance and remain a long time visible, but finally disappear, and leave the surface free from scars. The fever which ushers in the eruption usually disappears during the eruptive process and seldom revives to constitute a secondary fever. The constitutional derangement is in most cases slight, and seldom confines the patient to the bed. The cutaneous inflammation and the interstitial tumefaction which accompanies the eruption is commonly quite inconsiderable; and the pocks are upon the whole rather smaller than in the natural small pox, and are in moderate number, seldom appearing more numerous than represented in the portraits which have been referred to in this description. These are the more common symptoms and characters which

attend and distinguish the varioloid eruption during its course. But although a large proportion of cases correspond to the description and representation now given, yet the disease assumes every degree of modification. The eruptive fever varies from one to four days in duration, and is sometimes so slight that it is scarcely perceptible, whilst occasionally it is very sharp and is accompanied even by convulsions and delirium. The eruption in some instances breaks out, and passes through its various stages of vesication, desiccation and desquamation in the short period of six or eight days. This was the case with the eruption represented in the figures 1, 2, 3, 4, in plates VIII. and IX. as is stated in the explanatory text. In other instances the eruption does not complete its course short of twelve or fifteen days. The pocks vary exceedingly as it regards their number. In some cases they are limited to a dozen or less, whilst in others they are very numerous, and even confluent, as is represented in the portraits in plates X. XI. XII. The eruption sometimes breaks out and completes its number in the course of twenty-four hours; at other times it appears in successive crops for three or four days, and the pustules are huddled together in clusters, as in the case which is delineated on the plates last referred to.

Under all these modifications, however, the disease is distinguished by some certain uniform characters. The eruption retains much of its vesicular character, the pocks appearing through their course, to be distended with a fluid more serous or lymphatic than purulent. It is papular at its commencement, and the pocks are hard and moveable under the finger. The vesicles when formed, are elevated on solid tubercular bases. The eruption has its seat in the true skin, as is evident from the facts just stated, and as is also shown by the hard elevated bases which remain after the vesicles are evacuated of their contents by puncture and pressure, and by the kernels or tubercular elevations which remain in the skin after the scabs have fallen. The disease is highly contagious, and is capable of communicating to the unprotected the true unmodified small pox either through the medium of the atmosphere, or by inoculation.

In the inflammatory character of the eruptive fever, in the seat of the eruption, in its early appearance, and in the infectious properties of the contents of the pustules, the varioloid disease does not differ from the original unmodified small pox. The principal particulars in which it does differ from the true disease and by which it may in most cases be distinguished from it, are the following: The precursory symptoms are less violent and of shorter duration; the eruption takes place rather sooner and is more promptly completed; the pocks are less regular in the order in which they invade the different regions of the body, and in their distribution over them; they are seldom preceded or accompanied by an erysipelatous efflorescence; they are more early and rapidly developed than in the unmitigated variola, and are less distended with virus. The liquor secreted in them seldom becomes perfectly purulent, but remains serous and limpid. Desiccation takes place suddenly and is quickly completed. The varioloid is not attended by a secondary fever, nor is it accompanied by the salivation, nor does it emit the unpleasant odour, which are so peculiar to the unmodified disease. The interstitial effusion, and the swelling of the face and eruptive surfaces are usually inconsiderable in the mitigated malady, and the skin after the scabs have fallen, is destitute of the redness which remains in it after the small pox, and is distinguished only by a tubercular appearance, which however soon disappears. The most remarkable circumstances which distinguish the modified from the unmodified disease, are the comparative mildness of its symptoms, the rapidity of its march, and the shortness of its duration.

EXPLANATION OF PLATE XIII.

In the Figures, *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, *i*, *j*, and *k*, occupying the upper portion of this plate, is delineated the *perfect cow pox vesicle* as it appeared on the arm of a healthy child, on the *fourth*, *fifth*, *sixth*, *seventh*, *eighth*, *ninth*, *tenth*, *eleventh*, *twelfth*, *fourteenth* and *nineteenth day* after the operation of vaccination was performed. At *a*, in figure *f*, is a profile view of the pustule as it appeared on the ninth day, and when it presented a depressed or cup-like surface; and at *b*, in the same figure is a representation of an efflorescence which frequently invades the cutaneous surface from the eighth to the tenth day of the disease. At *a*, in figure *k*, is a delineation of the scar which was permanently left in the skin after the scab had fallen off.

In the Figures under the numerals 1, 2, 3, 4, 5, and 6, in the lower left hand portion of plate XIII. is a representation of a *spurious cow pox vesicle*, as it appeared on the *third*, *fourth*, *fifth*, *sixth*, *seventh*, and *eighth day* after the matter was inserted into the arm. This is only one of the innumerable forms which the vaccine vesicle assumes when it departs from its regular course and loses its antivariolous power.

In the Figure in the lower right hand portion of plate XIII. is a representation of the *chicken pox* eruption in its different forms. The eruption which is represented under A. existed on a little boy two years old, and would have been termed by Willan the *lenticular varicella* or *chicken pox* peculiarly so called. The characters which this eruption assumed during

its course, or on the *first*, *second*, *third*, *fourth*, *fifth*, and *seventh day* of its age, are well represented at *a*, *b*, *c*, *d*, *e*, and *f*. The vesicles in this case appeared in succession for a number of days, and the painting from which this figure is engraved, was taken on the fifth day after the eruption first began to break out. The eruption was copious and with the exception of the little scabs represented at *f*, &c. presented all the diversified appearances delineated in this print.

The delineations under the letters B. and C. are pictures of the *conoidal* and *globated varicella* of Willan, and are accurate copies of his representations of these two species of the chicken pox.


a
b
c
d
e


a
f
g
h
i
b


j
k
a
A
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C
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c
1
2
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6

DESCRIPTION AND REPRESENTATION

OF THE

COW POX.

When the operation of vaccination has been performed by means of a lancet or a small sharp pointed instrument, and with pure matter, a slight redness or inflammatory blush takes place almost instantaneously at the punctured point. This redness or inflammation, however, arises merely from the irritation caused by the instrument and is no certain sign of the success of the operation. It usually disappears in the course of a few hours, and no effects of the introduction of the virus are observed, excepting perhaps a slight elevation and induration of the puncture, until the third day, when the period of the true vaccine inflammation usually commences. At this time the puncture assumes a faint red colour, is slightly conical in its form, and resembles a flea-bite. This small inflamed spot is hard to the touch, projects a little above the surface on which it is situated, as may be seen by taking a profile view of it, and presents in its centre the little furrow made in the cuticle by the instrument.

On the *fourth day* the little tumour enlarges, and becomes deeper in colour and perfectly circular in its form, see plate XIII. figure *a*. The surface of it is smooth and shining, and before the termination of this, or by the commencement of the fifth day, a small vesicle may be discovered forming round the puncture. The cuticle surrounding the puncture, and in immediate contact with it, may be seen rising up and separating itself from the true skin, and becoming distended with new formed lymph.

On the *fifth day* the tumour and inflammation increase in diameter and redness, see plate XIII. figure *b*, and in its centre a slight depression is formed which is easily distinguished by passing the finger over it. The depression is confined to a mere point, and is evidently owing to the adhering of the cuticle, in that spot, to the true skin beneath, and to a secretion of a minute quantity of transparent fluid round the puncture, elevating the rising cuticle and thus forming a proper vesicle. The vesicle is usually quite easily distinguished by the eye at this period, and is firm and resisting. An itching is felt at the inflamed part, which sometimes becomes quite troublesome to the patient, and urges him continually to rub it.

On the *sixth day* the characters which the vaccine tumour presented on the fifth, are become more strongly marked, see plate XIII. figure *c:* the tumour itself is increased in all its dimensions, and its inflamed surface presents a more transparent and polished appearance. The vesicle which heretofore, has been confined to a mere line encircling the puncture in the centre of the tumour, appears now slightly elevated above the inflamed surface, and occupies a circle of about a line in diameter. It now presents a more evident depression in its centre, and its margin is smooth and rounded, and its surface has a polished, radiated and silvery appearance, resembling as has been very aptly observed, "the fractured end of a piece of lunar caustic." The central point of the depressed surface, and which answers to the puncture made by the instrument, is of a darkish blue colour, and is hard and dry. A narrow circle of inflammation, corresponding to the remaining portion of the tumour, still remains surrounding the vesicle, of a deep red colour at its base, diminishing gradually in brightness and intensity till it becomes confounded with the natural complexion of the skin. The portion of the tumour occupied by this remaining ring of inflammation is harder and more resisting than the adjoining healthy flesh.

On the *seventh day* the vaccine vesicle increases in size, see plate XIII. figure *d*, and occupies more of the inflamed tumour, so that the circular inflamed ring which surrounded its base on the sixth day, has now in a great

measure, given place to the vesicle. The distended and rounded margin of the vesicle increases in prominency, and stands out still further from the surface, and its central depression at the same time increases in depth. The surface presents an uneven, and a slightly concave or cup-like form, and a light silver or pearl colour which deepens gradually in shade from the circumference to the centre, so that the centre has a light brown colour verging to a faint yellow.

On the *eighth day* the vaccine tumour gradually increases, see plate XIII. figure *e*, the vesicle continues to secrete its peculiar fluid and to augment in diameter and elevation: its circular margin becomes more prominent, distended and rounded in consequence of the continued formation of virus, and its central depression becomes proportionally deeper. In the course of this or the following day, and sometimes earlier, a circle of inflammation arises immediately around the vesicle of a deep florid colour at its base, and extends as it were by irradiation and diminishes in brightness till it becomes assimilated with the tint of the sound parts, thus forming a regular areola of a line or two in breadth. As the areola forms and extends, the parts which it covers, gradually swell and increase in firmness and resistance. The vesicle has now attained to its most perfect state. The virus contained in it is now ripe for use, and this is generally the most proper period to take it. It can be obtained, however, from the time the vesicle first shows itself; but it cannot be collected in sufficient quantities for preservation till the eighth or ninth day. If the vesicle be punctured at this period with a lancet, the virus will ooze out drop by drop in quantities proportioned to the number of cells pierced and ruptured by the instrument. The fluid from the moment of its first formation till this stage of the disease, is colourless and destitute of odour, and dries immediately when exposed to the air. When it has become hard by drying, it resembles light coloured varnish or gum, and preserves in a greater or less degree its transparency. The fluid as has been demonstrated by dissection, is contained in numerous little cells separated and distinct from each other; and it is in consequence of

this peculiar structure of the vaccine vesicle, that the fluid, when the vesicle is punctured, passes out so slowly and in successive particles. From the time the inflamed ring or areola begins to be formed and to surround the base of the vesicle, it increases rapidly in breadth, and by the commencement of the ninth day, the vaccine tumour presents a phlegmonous appearance and is firm and somewhat painful to the touch.

On the *ninth day* and sometimes on the tenth, the patient experiences some local and constitutional suffering. The inoculated part is very tender to the touch, an obtuse pain is frequently felt extending from it along the inside of the arm to the axilla, and the axillary glands swell and become painful, particularly on moving the arm. With these local symptoms the whole system now begins to participate, which is manifested by increased restlessness, by langour, stretching and chillness, by dizziness, headach, soreness in the limbs, pain about the loins, aversion to food, nausea and sometimes vomiting ; by preternatural fullness and frequency of the pulse, flushing of the face and a considerable degree of fever. The constitutional affection continues with greater or less severity for a day or two, and ceases by the time or before the areola reaches its full size. As soon as the constitutional symptoms show themselves, the vaccine tumour undergoes very considerable and sudden changes. It increases rapidly in size, and the efflorescence or areola which before was quite limited, now spreads and in a short time attains to double its former diameter, see plate XIII. figure *f*. The vesicle augments a little in circumference and becomes more distended with fluid so that it now projects one or two lines from the inflamed and tumid surface on which it is situated. The central depression or dipping of its surface is generally strongly marked at this period, and this as well as the size and projection and general appearance of the vesicle as seen side-wise is well represented at *a*, in figure *f*. The virus retains the general characters which characterise it on the eighth day. Sometimes, however, it looses as early as this day, something of its transparent and limpid qualities. The arm at this period feels heavy, and the tumour is hard and tender on pres-

sure. In the course of the febrile stage, or from the eighth to the tenth or eleventh day, a slight efflorescence or rash often breaks out on the arms, chest and neck, and resembles that which frequently precedes or attends the eruption of small pox, and is not unlike the measles in its appearance. This rash, which is faithfully delineated at *b*, in figure *f*, is considered by vaccinators as a pathognomonic sign of the constitutional effect of the vaccination, and is to be desired, although its absence is no indication of the inefficacy of the operation.

On the *tenth day* the vaccine tumour usually attains to its greatest dimensions, see plate XIII. figure *g*, and the inflamed ring or areola which covers it, is of a crimson colour and measures in different cases, from half an inch to two inches in breadth. The vesicle also reaches its destined size and is commonly about four lines in diameter. Its depressed surface even on the ninth day begins to rise up, and before the end of this, it becomes plain and frequently convex or highest in the middle. The virus contained in the vesicle loses in a degree its transparency and limpidness and acquires a muddy serous colour and becomes slightly viscid and consistent. At about the time the vesicle begins to be encircled by the areola, the central point of its surface begins to assume a darker appearance, and as early as the tenth day it changes to a light brown or yellowish colour and is hard and dry.

On the *eleventh day* the size and firmness of the tumour remain about the same, but the intensity of colour which characterised the areola on the tenth, is in some degree diminished. In declining, the areola usually begins to fade at its circumference. Sometimes, however, it first loses its colour and subsides around the base of the vesicle. And in some instances, instead of subsiding primarily at its circumference or immediately around the base of the vesicle, it is observed to grow pale and die away in its middle portion midway between the vesicle and its external margin. When the efflorescence fades in this manner, it is divided into two regular rings which form two distinct and well marked areolæ, one immediately in

contact with and surrounding the vesicle, and the other exterior to this and occupying the circumference of the tumour, see plate XIII. figure *h*. The vesicle begins to shrink and flatten a little, and its fluid contents grow thicker and yellower. The process of desiccation goes on, and the surface of the vesicle presents a number of little lines extending from the centre towards the circumference. The soreness and sense of weight heretofore felt in the arm, and the swelling and tenderness of the axillary glands are no longer experienced, and the general and constitutional symptoms subside or completely vanish.

On the *twelfth day* the swelling, tension and inflammation of the tumour diminish rapidly, see plate XIII. figure *i;* the external margin of the areola usually disappears and the inflammation is confined to a narrow ring encircling the base of the vesicle. The matter in the vesicle now resembles pus and continues to grow thicker, and to concrete into a solid form, so that one third or more of the surface of the vesicle is covered by a yellowish and opaque scab which is dry and hard in its centre, and decreasing in consistency and opacity towards its irregular and serrated border. From this time the areola gradually disappears, and by the fourteenth day it is limited to a circle round the base of the maturated vesicle, measuring no more than a line in breadth, and presenting a purple instead of a roseolous tint. The vesicle diminishes and becomes contracted a little in its size as its contents concrete and the process of scabbing goes on, and its surface by the end of this day is nearly or quite covered by the scab. The appearance of the tumour on the fourteenth day is well represented in plate XIII. figure *j*.

By the *fifteenth* or *sixteenth day* the swelling, tension and inflammation of the arm entirely disappear, and from this time to the eighteenth or twentieth day the scab increases in hardness and in dryness, becomes more contracted and acquires a chocolate or mahogany colour, see plate XIII. figure *k*. The cuticle which is in immediate contact with the base or margin of the scab, breaks and separates from it as the swelling subsides and

leaves about it a slight and irregular roughness. As the cuticle dries and breaks, the inferior edge of the scab becomes exposed and the scab itself apparently rises up from the arm. After this period the scab continues to harden and to contract and to grow darker and more opaque. It gradually detaches itself from the skin beneath, adheres at length to the arm by nothing but its centre, falls off about the twenty-fifth or eighth day, and leaves an indelible depression, or pale cicatrix in the skin of about four or five lines in diameter, exhibiting a number of small pits or indentations which are supposed to correspond to the number of cells of which the vesicle had been composed; see the representation at *a*, in figure *k*.

The fallen scab is hard, dry and light, of a reddish brown or mahogany colour, and is more solid and opaque in its centre than towards its circumference. Its upper surface is smooth and shining, rounded and highest in the middle; its under surface on the contrary is rough or unpolished, and flat or slightly concave. The scab is therefore thickest in the middle and thinnest at its edges. When divided into slices by a scalpel it presents a grayish or ash coloured appearance, and when triturated with soft water it forms a ropy and glutinous mixture which is capable of communicating the disease.

Such are the peculiar symptoms and features which mark the rise, progress and termination of the vaccine vesicle.

Its developement, however, is not in every case so regular and uniform as has now been described. It is liable to some deviations in its general course and in its particular stages.

I. As it regards its general course:—

It is usually more rapid in summer than in winter, in warm than in cold climates, in hot and dry seasons than in those which are cold and wet, and in persons of a sanguine than in those of a cold or phlegmatic temperament.

II. As it regards its particular stages, and:—

1st. Of the developement of the vesicle.

The virus does not always act so soon as the third day, but sometimes

lies dormant for several days before it excites any inflammation or alteration in the part where it was inserted. And when the vesicle does appear, whether it be at the usual period or not, it is sometimes premature and sometimes tardy in its march, and arrives at maturity a day or two earlier or a day or two later, and is occasionally larger and more turgid, or smaller and less projecting than is represented in the text and plate.

2d. Of the developement of the areola and constitutional symptoms.

The efflorescence and constitutional symptoms vary occasionally in the time of their appearance and in the term of their duration. They not unfrequently appear a day or two earlier or later, and continue for a longer or shorter period than has been mentioned.

The areola in some cases measures less than half an inch in diameter and is of a pale red complexion; in others it extends over a good portion of the arm and is of a bright crimson colour. In the former case it usually begins to subside and fade very early, and in the latter it exists and retains its tint for several days.

The constitutional symptoms which generally appear with the areola are sometimes so slight as not to divert the child from his accustomed sports, while at others they are so severe as to confine the patient to his bed.

3d. Of the developement of the scab.

Like the areola, the scab is sometimes premature and sometimes tardy in its commencement and formation. In a few cases it is completely formed and falls off in a fortnight, and occasionally desiccation is not completed and the scab detached before the end of the fourth week. When the vesicle passes through its course regularly, and without accident, the form of the scab seldom deviates from that represented in the plate; but its colour varies somewhat according to the complexion and structure of the skin. It is darker and less transparent in the African than in the white, and in persons with thin and delicate skins than in those whose skin is thick and coarse.

These varieties, however, whenever they do occur, are not such as to alter the true characters, and the anti-variolous power of the disease. For,

notwithstanding these occasional variations, the vesicle, if genuine, will still preserve its circular form and its distended, rounded and firm margin, its central depression and polished surface, and will present in fact all the general appearances, and possess all the common qualities which have been described and represented in the text and accompanying plate.

Every eruption resulting from vaccination which does not present these characters, is spurious and should not be relied on as a preservative against the small pox.

If for instance, the punctured points should inflame immediately after the operation, and the vesicles should assume a conical form and become purulent at an early period, and acquire during their course irregular and indented borders, and present the general appearances represented in the figures under the numerals 1, 2, 3, 4, 5, and 6, in the lower left hand portion of plate XIII.; or should the vesicles be very small, flat and pale, should they consist only of a single cavity, and be soft and yielding under the finger; should they pour out their contents suddenly on being punctured, or terminate either with yellow amber coloured scabs, or in ulcerations and leave smooth, white, shining and strongly marked cicatrices in the skin after desquamation, the disease is to be considered irregular and imperfect.

The vaccine disease resembles in many particulars the inoculated small pox, and the latter has occasionally been mistaken for the former. The symptoms and characters of the two maladies, however, are widely different, as is evident from the following comparison of them.

For the first three or four days succeeding the inoculation for the cow pox and the small pox, the symptoms and march of the two diseases are much alike, and although there is usually a little difference in the time at which the true inflammation of each disease commences, and perhaps in some other symptoms, still these differences do not always exist, and no characteristic and discriminating marks arise previous to the fifth or sixth day of the operation by which the diseases can for a certainty be distinguished from each other.

At this period the *vaccine vesicle* is distinguished by its beautifully circumscribed form, by its smooth, hard and rounded margin, and by a slight but very evident discoloured depression in its centre.

The *inoculated small pox pustule*, at the same epoch, begins to assume an irregular and angulated margin, and has a globular or spherical surface without a central depression.

The surface of the *vaccine vesicle*, which from the fifth to the ninth day is distinguished by a strongly marked central depression, begins to rise up by the ninth or tenth day, and soon becomes plain and even conical or highest in its centre.

The surface of the *inoculated small pox pustule*, on the contrary, is somewhat globular for the first six or seven days, but after this period it becomes flattened, and presents an irregularly formed depression in its centre. The *vaccine vesicle*, through its whole course, retains its regularly circumscribed form and rounded margin.

The *inoculated small pox pustule*, as it pursues its march, becomes more and more irregular, and its margin more and more indented and jagged until desiccation takes place.

The *vaccine vesicle* from the time the virus commences to be secreted in it until the maturating process begins, is composed of a congeries of little cells which exist independently of each other.

The *inoculated small pox pustule* consists of one single cavity.

The *vaccine vesicle* until it begins to maturate, stands out distinctly and prominently from the surface, is hard and elastic to the touch and is not easily ruptured even by a blow.

The *inoculated small pox pustule*, seldom rises so high above the surface, during any part of its course, as the vaccine vesicle does; it is soft to the finger and yields readily under pressure, and is easily ruptured.

The *vaccine vesicle* is so firm, and so strongly supported by its internal structure that it preserves its rounded figure and even increases in its prominency when the parts on which it exists are fully distended.

The *inoculated small pox pustule*, on the contrary, when the structure on which it exists is put upon a stretch, is easily varied in its figure and can be made to assume various shapes.

To evacuate completely the *vaccine vesicle* of its liquid contents, each individual cell of which it is composed must be ruptured ; and even after all the virus has been withdrawn from it which can be obtained, its size and prominency seems very little diminished.

To evacuate the *inoculated small pox pustule* of its virulent secretion, it is only necessary to make one single puncture, the virus flows out at once, the cavity of the pustule becomes empty, and its surface becomes flaccid and sinks down.

The colour of the *vaccine vesicle*, from the third or fourth until the eighth or ninth day of the operation, is that of pearl, or it more exactly resembles that of the finger nail when deprived of blood by pressure.

The colour of the *inoculated small pox pustule*, from the time the secretion is first formed in it until it begins to grow thick and dry up, is whitish and opaque.

The *vaccine scab*, after it falls off, is circular in form, of a mahogany colour, and thickest and most compact in its middle.

The *inoculated small pox scab* is irregular and angulated in figure, thin and of a dark colour throughout.

The scar left in the skin by the *vaccine vesicle* is round and regularly circumscribed, and is indented by a number of small pits.

The scar left in the skin by the *inoculated small pox pustule* is irregular in figure, is white and smooth and unmarked by any little indentations.

Besides these differences in the character of the two diseases, there are others of a constitutional nature.

In the *vaccine disease* a ring of inflammation begins to be formed, about the eighth day, round the base of the vesicle, and increases in diameter until about the eleventh day when it usually reaches its full size. During this period a slight fever, and constitutional irritation supervene and continue for

a few hours. The fever is, sometimes though seldom, accompanied or followed by an efflorescence which, however, declines as soon as the areola begins to fade; but it is never accompanied or followed by vesicles unless these are produced by the accidental introduction of vaccine virus from the original vesicle.

In the *inoculated small pox* an inflammation surrounds the pustules of insertion from the beginning, and this, about the sixth day, spreads and continues to do so for a number of days. A fever of some severity springs up, during this time, and in the course of three days is followed by a crop of regular variolous pustules which break out in different parts of the body.

The *local vaccine tumour* is regularly circumscribed until the tenth or eleventh day, and is smooth and polished.

The *local variolous tumour* is rather irregularly circumscribed and is studded by a number of miliary pustules which rise up near the pustules of insertion.

During the *vaccine disease* no unpleasant or unnatural odour is observed to arise from the breath or body of the patient.

During the course of the *inoculated small pox* an ungrateful odour, which has been described as peculiar to the variolous disease, may generally be perceived on entering the patient's room.

The *vaccine disease* is incapable of giving rise to the variolous eruption, and never proves fatal.

The *inoculated small pox* is highly contagious and sometimes terminates in death.

DESCRIPTION AND REPRESENTATION

OF THE

CHICKEN POX.

The eruption in this disease, as in the small pox and varioloid, is usually preceded by a fever and some constitutional affection. The precursory symptoms are languor and drowsiness; loss of appetite, headach, hot skin, quick pulse, furred tongue, thirst, dryness of the mouth and fauces, a tickling and unpleasant cough; soreness in the throat, stomach and bowels; nausea and sometimes vomiting; and pains in the back, loins and extremities. In most cases the precursory fever is mild in its character, and attracts and requires but little attention. In some instances, indeed, and particularly in children, the eruption makes its appearance without any premonitory signs and without any apparent illness. But sometimes, on the contrary, the invasive symptoms of the disease are severe and strongly marked, and the gastric distress, the pains in the head, back and loins and the common febrile disorder are equal in intensity and duration to those which precede the eruption of the natural small pox. The fever usually commences about two days before the eruption breaks out, and subsides when the vesicles cease multiplying. The eruption makes its appearance in small inflamed spots indifferently on every part of the body; but it most commonly breaks out first, on the back and breast and round the shoulders, then on the face and hairy scalp, and lastly on the extremities. These spots which are well represented at *a*, figure A. in the lower portion of plate XIII. are not exactly circular, but tend to an oblong figure. They rise but slight-

ly above the common structure, are of a pale red colour, and have smooth and shining surfaces. They can be distinctly felt by drawing the finger over them, but they are destitute of the tubercular hardness and rolling motion which characterize the variolous eruption of the same age. The vessels of which these red spots are composed are but slightly injected, and the eruption disappears under the smallest pressure and on a slight distention of the parts on which it is situated. In a few hours after the formation of the inflamed spots, and almost always at or before the commencement of the second day, a minute vesicle may be discovered rising up in their centre characterised by a whitish, transparent and extremely thin covering. The little covering or pellicle, consisting as it were of a single layer of the cuticular membrane, is separated from its connexions and supported by a few globules of limpid serum.

On the *second day* the vesicles increase in size and measure from one to two lines in diameter, and occupy the whole of the inflamed spots with the exception of a narrow circle at their margin, see at *b*, figure A. plate XIII. Their slender tops are distended to a greater or less degree by a serous secretion, and resemble little bladders of fluid situated upon narrow inflamed bases. These little bladders or vesicles vary somewhat in form, size and colour. Some are perfectly circular and have rounded or globular tops, or else rise up into little cones; others are oblong and occasionally irregular in their figure and have flattened surfaces. The serum contained in them is usually pellucid and colourless; but it is sometimes clouded, or of the colour of milk-whey. When viewed side-wise or in profile, against a strong light, the vesicles which stand out prominently from the surface, are diaphanous, and all of them are smooth, and present some degree of resistance to the touch. They easily give way, however, under pressure, and communicate to the finger a soft elastic sensation or a feeling similar to that which a minute globe of fine sponge softened with water, would give rise to on being pressed. If the parts on which the eruption exists be now put into a state of moderate distention by the thumb and fingers acting in opposite di-

rections, the inflamed borders of the vesicles quickly disappear, and the vesicles themselves on a slight increase of that distention gradually subside and finally disappear so completely that no traces of them can be discovered either by the eye or finger.

If the vesicles be punctured with a lancet, their contents will readily flow out, and the thin pellicles which cover them will immediately fall down to a level with the skin and collapse. The interior of the vesicles presents, when examined with a lens, some degree of inflammation and redness, but the skin itself appears unaltered in its structure, and the true seat of the vesicles is apparently in the cellular membrane between the cutis and the cuticle.

On the *third day* the vesicles generally arrive at their full maturity; their form and size, however, remain nearly the same as on the second day, but the fluid contained in them becomes slightly turbid and assumes a yellowish hue, see at *c*, figure A. plate XIII. The structure and physical characters of the eruption have undergone no material changes. The vesicles will, however, frequently burst on distending the structure in which they exist, and I have remarked that their bases present a slight hardness which was not peculiar to them before, and that they do not always entirely disappear when the distention is made, but leave a slight discoloration in the skin corresponding to them.

On the *fourth day* and frequently on the *third*, the thin and fragile coverings of many of the vesicles break and collapse, and the fluid which escapes concretes immediately into yellowish gum-like crusts. The vesicles which remain whole are somewhat contracted in their dimensions and shrivelled at their edges, and the liquor contained in them increases in consistency and opacity, see at *d*, figure A. plate XIII. They give way easily under the pressure of the finger; a sensible tubercular hardness is felt at their margin when they are pressed down to a level with the surface, and by distending the skin until the areolæ and vesicles subside and disappear, narrow discoloured and slightly elevated circles corresponding to the bases

of the vesicles, are easily distinguished by the eye and touch. In the vesicles whose tops are broken and contents have escaped, the discoloration and induration of their bases are more strongly marked.

As early as the *fifth day*, most of the vesicles are broken and many of them are covered by light coloured and softish crusts. As the vesicles burst, their cuticular coverings collapse and adhere to the true skin beneath in such a manner as to confine a little opaque lymph within their puckered margins, see at *e*, figure A. plate XIII. The areolæ which surround the vesicles gradually disappear and the fallen and closed orifices grow dry and concrete into little scales of a yellowish brown colour. From this period desiccation advances rapidly, commencing usually at the circumference and proceeding towards the centre, and by the *sixth day* all the vesicles are converted into small, soft and brownish crusts. These soon grow drier and harder and become contracted into small round scabs of a reddish brown colour, see at *f*, figure A. plate XIII. From the *seventh* to the *tenth day* these scabs gradually separate and fall off, not in a single piece, but in small dry or scaly fragments of different sizes and forms, leaving for a few days slight discoloured marks or depressions in the skin.

The eruptive stage of varicella, even when this disease appears in its mildest form, is seldom completed in a single day. The vesicles more commonly continue to appear in a succession of fresh crops for two, three and four days, all of which run the same course, undergo the same changes and present the same appearances as described above. The duration of the disease, therefore, varies and is longer or shorter according to the time occupied by the breaking out of the eruption. When the eruption breaks out in successive crops for the period just stated, it exhibits about the *fifth day* a great variety in its appearance. Vesicles of all ages and in all the different stages of their progress, are at this period frequently mingled together and intermixed with each other on the same parts of the body; some slightly elevated, others filled with fluid, and many are ruptured, shrivelled, crusted and vanishing; and the disease presents all the diversified appearances

represented in figure A. plate XIII. Although the eruption in varicella generally makes its appearance in successive crops, and runs a course such as has just been described, still it varies in both of these respects.

In some instances all the vesicles make their appearance simultaneously or in the space of a few hours, and then pursue their regular course, fill and arrive at maturity at about the same period or on the third or fourth day. In other cases they break out, are developed and begin to desiccate in the short space of thirty or forty hours. Whatever be the order in which the eruption breaks out, whether it appears simultaneously, or in a succession of vesicles, its number is subject to infinite variations. In some cases there are not more than eight or ten vesicles; in others every part of the body, and more particularly the chest, back and face are thickly studded with them, and in a few instances they have united with each other, ran together and become confluent. While I am now writing a case of this kind exists in this city. The subject of it is a child one year old; it is now four days since this child first broke out with the eruption, and its whole surface is at this period every where invaded by the vesicles; and on the face, abdomen and shoulders they have become completely confluent. In many other regions the vesicles are in close contact, and the tongue, palate and the lining membranes of the mouth and nose are covered with them.

In almost every case of varicella in which the eruption is any way numerous, some variety of form and character, as has been before stated, may be observed among the vesicles. This fact led Willan to examine the vesicles minutely, and to distinguish them, according to the forms which they assumed, into three distinct varieties which he has termed *lenticular*, *conoidal* and *globate*. The eruption, represented in figure A. plate XIII. to which frequent reference has been made in the above description, would be considered, according to this arrangement, as the *lenticular varicella*, or the chicken pox properly so called.

The other two varieties, the *conoidal* and *globate* are represented in figures B. and C. which are exact copies of Willan's delineations of them.

"As, however, vesicles of all these shapes, and even of others, are sometimes seen in the same patient, they probably proceed from no difference in the affection; but from accidental varieties in the state of the skin, and in the degree of inflammation." When the disease is severe and the eruption numerous, there arises a considerable degree of inflammation and efflorescence in the skin; the face is then considerably swollen, the eyes are very sensible to light and are watery, and the febrile symptoms last until the vesicles begin to desiccate, and in some instances till the scabbing process is effected. In these cases there is frequently some irritation of the mucous membranes of the throat and bronchiæ, which gives rise to a cough that lasts through the disease, and occasionally for some days after its completion. The eruption through its course is tender and painful on being pressed, and is attended with much itching. The patient through the whole of the disease, particularly if it be severe, is quite languid and is continually inclined to sleep.

In most cases the chicken pox is by the experienced observer, easily and readily distinguished from the small pox. When however the former is extraordinarily violent, and the latter unusually mild, the distinguishing marks are obscure, and the two diseases are therefore frequently confounded. To render the distinctions as clear as possible, I shall now repeat the more prominent symptoms of the two diseases and contrast them with each other.

In *small pox* the fever is ushered in by a cold stage, is severe and continues three or four days, and if it declines or ceases during the eruptive process, it commonly reappears during the suppurative stage, or between the fifth and eighth day of the eruption.

In *chicken pox* the fever is not often preceded by a cold stage, is uniformly light and is frequently insensible; it seldom continues more than two days and never reappears after it has once ceased. When, however, the vesicles appear in successive crops the fever lasts longer and rages until the eruption is completed.

In *small pox* the eruption is often preceded or accompanied by an erysipelatous efflorescence.

In *chicken pox* this efflorescence does not take place.

In *small pox* the eruption does not break out until the third or fourth day of the fever; it appears first on the face, then on the neck, chest, trunk and extremities, and is completed in the course of two days.

In *chicken pox* the eruption breaks out by the termination of the first or on the second, and almost invariably before the end of the third day of the fever; it usually appears first about the breast and shoulders, afterwards on the face and extremities. It often, however, follows a different order, and is never so uniform in the method of its invasion as the eruption of the small pox; it frequently appears in successive crops for four or five days.

In *small pox* the eruption presents itself in the form of small red circular points or papulæ; these are hard, resisting and moveable, and communicate to the finger a shot-like sensation. They scarcely project above the surface, but are easily and distinctly felt by drawing the finger over them.

In *chicken pox* the eruption likewise breaks out in small inflamed spots, but these are not papular in their origin, and are not exactly circular, but tend to an oblong figure. They may be distinctly felt by the finger, but they are yielding under it and are destitute of the tubercular hardness and rolling motion which characterize the variolous eruption at the same period.

In *small pox* the eruption seldom becomes vesicular before the end of the second, or the commencement of the third day, and the vesicles are confined to the summits of the pocks.

In *chicken pox* the eruption is vesicular from the beginning or from the early part of the first day, and by the second day the whole surface of the pocks are converted into vesicles which resemble little bladders of transparent fluid.

In *small pox* the pustules at first have acuminated summits; they afterwards become rounded, and at an early period present slight depressions in the centre of their surfaces.

In *chicken pox* the vesicles are usually lenticular in form, but are sometimes conoidal or globate, and preserve one shape through their course, or until they become ruptured.

In *small pox* the eruption is situated in the substance of the cutis, as has been proved by dissection, and as is evident from the sensation which the pustules communicate to the finger.

In *chicken pox* the vesicles are not formed in the true skin, but are situated upon its surface in the cellular tissue between the skin and cutis.

In *small pox* the pustules after they have become vesicular are distinguished by hard, unyielding bases.

In *chicken pox* the vesicles are destitute of such tubercular bases, they are yielding and easily give way under pressure, and communicate to the finger a soft elastic sensation or a feeling similar to that which a minute globule of fine sponge softened with water would give rise to when pressed.

In *small pox* the pustules are composed of little cells, all of which, however, communicate with each other; and the cuticular coverings of the pocks are opaque, tough and not easily broken.

In *chicken pox* the vesicles are composed of a single cavity, and the coverings are extremely thin and fragile, are diaphanous and very easily broken.

In *small pox* the pustules are, at an early stage, filled with a serous secretion; this after a time becomes converted into a purulent matter that exhales a very unpleasant and peculiar odour.

In *chicken pox* the vesicles contain, when fully matured, only a whitish transparent and serous fluid; this never, except through accident, becomes pus and is destitute of any ungrateful odour.

In *small pox* the pustules remain whole till they are six or seven days old, when some of them commonly become ruptured, and permit a little of the virus to ooze out upon their surface; but they still retain their form and prominency.

In *chicken pox* the vesicles often become broken in two or three days after their appearance, and permit the whole of their contents to escape, their

coverings then sink down and collapse, and the vesicles become flattened and lose their original form.

In *small pox* the pustules break out simultaneously, pursue a regular march and arrive at maturity about the same time.

In *chicken pox* the vesicles generally break out in successive crops for a number of days, in which case a great variety may be observed among them; some are appearing, whilst others are fully formed, shrivelled or crusted.

In *small pox* desiccation does not commence till about the eighth day from the appearance of the eruption.

In *chicken pox* when the vesicles run their course without bursting, desiccation commences in them as early as the fifth day of their age, but it always begins as soon as the vesicles are ruptured, and consequently it more usually commences on the third or fourth day, and sometimes as early as the second day after they appear.

In *small pox* the processes of eruption, of suppuration and of desiccation constitute three successive periods, rendered distinct from each other by their duration; the first occupies about three days and the other two about five days each.

In *chicken pox* these three periods seem to be confounded in consequence of the pocks appearing in successive crops, and even when they are distinguishable, the sum of their duration seldom exceeds eight days.

In *small pox* a salivation and bloody urine frequently take place during its course.

In *chicken pox* these symptoms never occur.

In *small pox* a general swelling of the cutaneous surface takes place just before the pustules begin to desiccate: this swelling is greatest in the face and hands, and in some instances the eyelids are so much swollen, that the eyes become closed and the patient for a time is deprived of sight.

In *chicken pox* desiccation is never preceded by any extensive swelling of the cutaneous surface.

In *small pox* the scabs fall off in a single piece.

In *chicken pox* the scabs do not usually fall off in a single piece, but in small fragments of different forms and sizes.

In *small pox* one of the most peculiar and prominent characters is the purplish colour which remains for a long time upon the surfaces of those who have had the disease.

In *chicken pox* the marks remaining in the skin after desquamation are but slightly coloured, and the redness, if apparent, soon disappears.

In *small pox* the scars which remain permanently in the skin are irregular in figure and present uneven surfaces.

In *chicken pox* the scars left permanently in the skin by the vesicles are usually regular in figure and present smooth surfaces.

The *small pox*, even when distinct and of moderate mildness, is a disease of fifteen or twenty days in duration, and it often proves fatal.

The *chicken pox*, on the contrary, runs its course and is completed in five or six days, or in eight or ten at most, and it never, of itself, proves fatal.

Lastly. The *small pox* has the power of communicating the variolous disease, either by contagion or by inoculation.

The *chicken pox* has no such power, and is incapable even of giving rise to a disease of its own kind by inoculation.

These are the principal circumstances which distinguish the chicken pox from the true unmodified small pox. But the distinctions between the chicken pox and the varioloid disease, or the small pox in its modified form, are less striking, and less easily recognised. The following peculiarities, however, may generally be observed in the two diseases and will, in most cases, lead to a correct discrimination.

The *chicken pox*, as has already been stated, is distinguished by the eruptive fever being generally light.

In the *varioloid disease* the precursory fever is commonly sharp and of several days duration.

In *chicken pox* the eruption appears in the form of vesicles, or it is vesicular, at least, from an early period of the first day.

In the *varioloid disease* the eruption is always papular in its origin, and seldom becomes vesicular before the second or third day.

In *chicken pox* the eruption breaks out by degrees, or in successive crops, and seldom or never in a sudden and simultaneous manner.

In the *varioloid disease* the eruption appears all at once and seldom breaks out in successive crops.

In *chicken pox* the vesicles when fully formed are destitute of any peculiar hardness or swelling at their bases, and are distinguished by the thinness and fragility of their coverings.

In the *varioloid disease* the pocks are, in the first instance, elevated on solid tubercular bases and their tops are resisting and not easily broken.

In *chicken pox* the eruption is situated in the cellular tissue between the cuticle and the true skin, as may be perceived by opening the vesicle and examining its edge after the lymph has run out.

In the *varioloid disease* the eruption, as in the unmodified variola, is formed in the substance of the true skin, as is evident from the hard and elevated bases which remain after the lymph is removed from the pustules by puncture and pressure, and by the kernels or tubercular elevations which remain in the skin after the scabs have fallen off.

In *chicken pox* the vesicles for the first three days, or until they are fully formed, are soft and yielding, and communicate to the finger, as already observed, a sensation similar to that which a minute globule of fine sponge would occasion on being pressed.

In the *varioloid disease* the pocks from their first formation, are hard and unyielding, and are moveable and rolling under the finger.

To these distinguishing characteristics, all of which have been noticed by various writers, the author would add the following :—

In *chicken pox*, if, during the first day of the eruption, the parts on which it exists be embraced with the thumb and finger and gently distended by them ; or if a single finger be drawn over them with a force just sufficient to cause the little rugæ of the cuticle to become smooth, the inflamed spots,

in which form the vesicles first present themselves, readily disappear and leave no discoloration or induration in the skin.

In the *varioloid disease*, if a like distention of the parts occupied by the eruption, be made at the same date, the inflamed spots disappear less readily and even when the distending force is sufficiently great to make them disappear, a dim discoloration can be perceived and a distinct shot-like hardness may be felt at the points upon which they were planted.

In *chicken pox*, if the eruptive surface be put into a state of moderate distention, on the second and third day after the eruption breaks out, when the vesicles are fully formed, by the thumb and finger acting in opposite directions, the inflamed borders of the vesicles quickly vanish and the vesicles themselves, on a slight increase of that distention, gradually subside and finally disappear, so that no traces of them can be discerned while the distending force is exerted. If the distention be made by the finger alone, acting on one side of the vesicles, at the distance of an inch or two from them, they can even then be made to disappear, but not so easily and perfectly as when a counter distending force is applied. In stretching the parts in this manner the inflammation and the edges of the vesicles next to the finger will first subside, and the vesicles will assume a slanting and wedge-like form until the skin is sufficiently stretched to cause the entire bladder to disappear.

In the *varioloid disease*, if on the second or third day of the eruption, or after it has become vesicular, the eruptive surface be distended by the thumb and finger, in the manner just mentioned, the areolæ which surround the pustules, and likewise the little vesicles which are formed at their summits, will vanish, but even an increased distention of the parts will not obliterate the bases and bodies of the pocks; they will still remain round, hard and prominent.

These experiments and observations should be made during the first three days of the eruption, and always before the vesicles of the chicken pox become broken, or their fluid contents grow thick and turbid. For it

should be remembered that the chicken pox eruption sometimes acquires a tubercular base and the varioloid eruption loses it about the third day.

In *chicken pox* the scars left in the skin after desquamation, are destitute of any peculiar hardness, and are, in the space of a few days, entirely erased.

In the *varioloid disease* the eruption, for a considerable time after the scabs have fallen, leaves little kernels, or tubercular elevations in the skin.

The *chicken pox* when it prevails epidemically, attacks individuals who have had the variolous and the cow pox diseases with equal readiness as it does those who have had neither.

In the *varioloid disease* this is not the case, for the variolous and cow pox diseases, in a majority of cases, preserve the system from second attacks of the same maladies.

The *chicken pox* is never communicated by the varioloid or the true unmodified small pox.

The *varioloid disease* may be communicated by the variolous disease both modified and unmodified.

An investigation into the source of the disease will, therefore, aid the physician in determining the character of the eruption.

Lastly. The *chicken pox* never gives rise to the varioloid disease or the true small pox, either by contagion or by inoculation.

The *varioloid disease* has the power of communicating the unmodified and modified small pox either through the atmosphere or by inoculation.