A DESCRIPTIVE ARTICLE ON

SMALLPOX

WITH 20 ILLUSTRATIONS

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ISSUED BY

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Smallpox.

A clinical description with twenty illustrations.

By Chas. A. Hodgetts, M.D., Secretary.

The oft repeated occurrence of this disease in different and widely separated municipalities of the Province during the past few years and the failure on the part of many medical men to arrive at a correct diagnose, are in themselves sufficient excuse for again bringing before the notice of the medical profession and the local health authorities, some few facts regarding smallpox.

Before discussing the question from a medical standpoint, it may not be out of place to refer to some of the popular and common errors which are and have been advanced by "knowing ones" regarding this disease, the advocacy of which untruths has done much to prevent the authorities adopting those preventative measures which are essential to the prevention of epidemics and unnecessary outlay of money by local Boards of Health.

Perhaps the most common of false ideas regarding the disease is that which finds expression in the statements "it cannot be smallpox because no one is really sick, and those who have it are at work," or "they are ill for only a day or two."

This popular misconception of the disease no doubt is due to the following facts: First, in former epidemics, the type of the disease was severe, patients suffering severely from the onset, which was generally sudden, then during the few days immediately preceding the appearance of the rash, there is headache, pains in the back and limbs with accompanying nausea and vomiting, often incapacitating them from all work.

Second. With the abrupt cessation of these symptoms, the rash began to show itself in a pronounced manner upon the exposed parts, as face, neck, hands and wrists, whereas the present form of the disease in many cases presents but few pocks or pustules, and often their presence gives but little inconvenience even when numerous.

Third. The only sickness complained of is that noticed before the onset of the rash, the secondary symptoms being either very slight or entirely absent,—this being often characteristic of cases when scores or hundreds of small pustules are present.

Fourth. The frequent aborting of the disease at the visicular stage,—as seen more particularly on the face, either the absence of the secondary fever or the slight character of the same—permitting of the patients often following their usual occupations throughout the whole progress of the disease, which frequently does not exceed a fortnight.

The other common errors are based largely upon the foregoing clinical facts and have led to the disease being called chicken pox, Cuban itch, Phillipine rash, elephants' itch, both by the laity and often by medical men, though, perhaps, the most common of professional mistakes has been to call it impetigo, contagiosa. Some few have thought it to be a new and as yet unnamed skin disease.

The experience of the past five years may be summed up briefly as follows:

Climate and season.—The disease has continued from year to year, with a maximum number of cases in January, and a minumum in the summer months. The type presented no variation in the cold of winter as compared to those happening in the heat of summer.

Contagiousness.—It would appear that the virulence of the contagium is in direct relationship to the severity of the attack. During the early stages preceding pustulation, the infection is not as great as subsequently, and the mere entering a room or house wherein is a mild case during the pustular stage, is not always followed by an attack. Often persons live for weeks in the same house with a mild case before they develop it. I have not known of a case due to aerial convection; indeed, on this point I am somewhat sceptical.

Incubation.—The usual period of twelve full days from the date of one receiving the specific infection of smallpox is, as a rule, the correct one; but the exceptions have been so numerous during the past five years, where fifteen, sixteen and eighteen days have elapsed, that for mild cases the period may safely be extended. By reason of the prolonged incubation, the period of quarantine has been extended to eighteen days, and in some of the neighboring States three weeks is the statutory period.

Initial symptoms.—While in many cases the onset, although slight in character, is often sudden, yet many patients have suffered so little discomfort, that it has been hard for them to fix any time for the onset. Mild and and insidious, indeed, have been the prodromata, from a passing malaise to headache, and backache, accompanied by nausea and vomiting; children and adults alike have had the same experience, and the latter have often followed their usual occupation throughout the whole progress of the disease. Many have described this group of symptoms as simulating la grippe more than anything else. The temperature has averaged from 100 F. to 102 F., while the instances have been as many below the minimum as above the maximum quoted.

The fever continues, as a rule, for twenty-four hours to seventy-two hours, although it frequently passes unnoticed by the patient; and often is noticed for from 1 to 12 hours; the temperature drops to normal or subnormal with the appearance of the eruption, and thus ends for many their sickness, and the usual occupation is resumed. Because the onset is severe it does not follow that the attack will be severe, nor does it hold true that the mild onset will be followed by a slight attack.

The Eruption.—This appears from a few hours to seventy-two hours after the onset, and consists, in the first instance, of minute red macules that disappear on pressure. They are not hard to the touch nor perceptibly raised above the surface. The distribution conforms very much to that of the more severe type of the disease, being more marked upon the face and extremities than on the trunk. Often within a few hours the maculæ become papules, when the shotty feel is first noticeable. This is frequently the first stage noticeable in mild cases, and by this time some of them may show distinct signs of beginning vesiculation. Thus it is stated by the patient that they began as vesicles, whereas the correct way to state it would be, the eruption was first noticed when vesiculation began. This is a fruitful source of error in diagnosis, and leads the practitioner to call the attack one of chickenpox.

The rash may appear in one crop, but more frequently, even in very mild cases, from one to three days may elapse before it has fully come out.

During vesiculation, which continues for about three days, rarely five, as seen in previous outbreaks, the vesicles increase in size until many of them

become as large as a pea, pearly in appearance, and either filled or partially filled with serum. The more typical will be found to be multilocular and different to the others; will not collapse on being transfixed by a needle. Some, but not all, of the vesicles will present umbilication.

The change to a pustule may begin as early as the fourth day, and usually, in most cases, is markedly noticeable on the fifth day. The rash on the face, sometimes shrinking and drying up into thin crusts, is shed from the face and neck often as early as the tenth day. Not so, however, is the course of the lesions on the other portions of the body and the extremities. It is here prolonged, and the pustules present a more typical appearance, and on the sixth to the eighth day of the eruption there will be found a circular pustule presenting a dome-shaped appearance, and surrounded by a marked areola. These pustules shrivel, and subsequently rupture or are broken, and the contents form a dry crust, or they become inspissated, presenting a brownish appearance. Particularly is this the case in the feet and hands, where the epidermis is thickened. The stage of incrustation continues for a longer period in the latter case than where simply thin crusts form. In the majority of cases there is no dermatitis, and if present, is but slight. Intumescence, if present, is not only slight in degree but is evanescent in character, and lasts for two or three days.

The average duration of this atypical form of smallpox is slightly under twenty-one days. Difficulties of Diagnosis. The chief difficulties met with have been as follows: 1. The frequently mild form of the onset. 2. The abortive character of the eruption, as observed chiefly on the exposed parts. 3. The entire absence of constitutional depression after the appearance of the rash, thus permitting of many persons resuming their usual calling. 4. The absence of secondary fever, even in more markedly typical cases. 5. The extreme mildness of the infection, as shown in many instances. 6. The brevity of the period of incubation as compared with former outbreaks. These, and possibly a few others of a minor character, have thrown many a physician off his guard, and led in the past to rather widespread outbreaks in some portions of the Province.

Of the foregoing, the abortive character of the eruption is the greatest source of diagnostic mistakes, for it is found that the eruption, once out, does not pass through the successive stages even in an imperfect manner, but it pursues an abortive course; given a case with a definite number of maculæ, there will be found to be an aborting of numbers of these, the remainder developing into papules, of which in turn, a number will also abort before becoming even slightly pustular. It will be further found that the papules have developed into solid conical elevations, crowned by small vesicles containing sero-purulent or sero-sanguino-purulent fluid, which vesicles desiccate early, leaving the solid portion which remains for some time as a warty-like excrescence of the skin. This is most frequently noticed on the face, but disappears without leaving any permanent disfiguration.

The size of the pustules or the aborted vesicles may be particularly noted. Usually circular in outline and of the size of a split pea, yet in many instances it is found that the greater number are smaller in size, some not larger than a good-sized pin-head. The apex of many will present a dark appearance similar to an acne, though without any marked dermatitis or intumescence. In such cases some few typical pustules will be found, possibly, on the abdomen or extremities or along the hair line. Again, early rupture of the vesicles or pustules produces, where such has occurred, an irregular outline, somewhat simulating chicken-pox.

Differential Diagnosis.—The affections with which smallpox of the present type has been, and unfortunately still is, most frequently con-

founded, are chicken-pox, impetigo contagiosa, pustular syphiloderm, urticaria papulosa and acne. Of these chicken-pox is the most common, chiefly owing to the fact that the premonitory symptoms have been so mild that the patient has misrepresented them to the physician; and coupled with these mis-statements there is found on looking at the exposed parts only a few, often only one or two, abortive vesicles or pustules. The examination is not pushed any further. Both parties concerned are satisfied; the patient particularly so from the knowledge of the fact that isolation will not be necessary, although he may be well aware that had the physician stripped him, an altogether different condition of affairs would have been found on the "hidden parts." The blame is in most instances to be laid at the door of the patient rather than at that of the medical attendant for the mistake, for had the one been honest, the other would have been more painstaking in his examination. In smallpox, believe nothing you hear, doubt much you see on first appearances, but carefully note all that the surface of the body has to reveal to both touch and sight.

The chief characteristics which distinguish chicken-pox from the present mild form of smallpox are: 1. It is a disease chiefly confined to childhood, being only occasionally seen in adults. 2. It rapidly runs its course in a week, passing through the stages of pimple, vesicle and scab, often within twenty-four hours after the first appearance of the papular rose spot the vesicle develops. 3. The premonitory symptoms are but slightly marked; indeed, are frequently wanting altogether. 4. The temperature accompanies or follows the appearance of the rash. 5. The vesicles of chicken-pox are ovoid or irregular in appearance, and attain their maximum development much quicker than do those of smallpox. 6. The eruption, as a rule, appears first on the portions of the body covered by clothing. 7. After the crusts fall off they leave a red instead of a pigmented spot. 8. Does not appear on palms of hands or soles of feet.

With these differential symptoms, it must be stated that many cases of smallpox of the present type occur, making it extremely difficult to correctly place them.* "It may, however, be stated in a general way, that a mildly febrile eruption, appearing without prodromal symptoms, being distinctly vesicular from the beginning, and commencing to desiccate on the second or third day, should be regarded as chicken-pox; and on the other hand, an acute exanthem, preceded by an initial stage of forty-eight hours, in which the temperature was distinctly elevated, beginning as papules and ending in vesicles and vesico-pustules, even though the period of evolution be short, should be regarded as smallpox."

Impetigo Contagiosa.—The chief points in the differential diagnosis of this disease are: 1. It is a skin affection, rarely accompanied at any stage of its progress by an elevation of temperature. 2. There is no initial stage. 3. It does not begin as a papule, but as a vesicle, or vesico-pustule, or growth of the same upon an apparently normal skin. 4. It appears chiefly on the face, head and hands—the exposed parts. 5. It is usually unsymmetrical and superficial, and spreads from the periphery, often attaining the size of a ten-cent piece. 6. The crusts are of differing degrees of thickness, are varied in color from straw to a brownish hue. They are friable, crumbling very easily. On removal, the base is covered with pus, which on healing leaves no scar. 7. Fresh inoculation may occur in the same individual, the infecting material being generally carried by the finger nails to any part of the skin.

*Com. W. Welch, M.D., Philadelphia Medical Journal, Nov. 18th, 1899.

Pustular Syphiloderm.—Although few mistakes have arisen from the diagnosis of cases of smallpox for pustular syphiloderm, yet there is a greater resemblance between these two diseases than is generally supposed. This stage of syphilis is ushered in by fever and accompanying pains and aches, very similar to smallpox. There then follows the papular eruption, which subsequently ends in the pustule. The chief distinguishing points are: 1. The absence of the shotty feel of papules. 2. The formation of small vessels at summit of the papules. 3. The large indurated base of the vesicles. 4. The appearance of the rash in successive crops. 5. Umbilication is absent. 6. The tendency of some of the lesions to ulcerate. 7. Examination reveals other symptoms of syphilis. 8. A history of the initial syhpilitic lesion is confirmatory.

Urticaria Papulosa.—In this disease the papules are small, the size generally of a split pea; in color a dull white. They attain their full size in one or two hours. The initial symptoms are absent.

Acne.—This skin affection occurs chiefly at puberty, and the chief points in the diagnosis are: 1. The absence of initial symptoms. 2. The pustules are acuminated with a black central dot or comedo. Base is indurated. 3. The face, shoulders and back are chiefly affected. 4. The rash will be found in all stages in the different portions of the body. 5. The chief diagnostic difficulty is found in the rash as it affects the face, as in these mild cases it often simulates acne. An examination of the whole body will assist in clearing up the diagnosis. There is no necessity to refer to the rashes which happen in the initial stage, for in this type of smallpox they seldom occur.

History of the Disease.

The first outbreak of the disease was that which occurred in Essex County in the fall of 1899, when 272 cases were reported, with one death, a mortality of 0.39 per cent., the disease in this instance having spread from the adjoining State of Michigan. In the following years the disease became more widespread, the infection in many instances being traceable to the United States. Although it became so general in this Province, yet the type did not on the whole become more severe, as shown by the mortality, although there were individual instances where the character of the symptoms approached more nearly to the text-book type.

In the winter of 1900-1 it appeared in the lumber shanties of New Ontario, having been brought there by shantymen from Michigan, one man, to my personal knowledge, being the cause of its breaking out in at least four different points, scores of miles apart. In these distant parts the disease made rapid progress before its presence became known, the hardy shantymen becoming a ready nidus for the disease from the fact that nearly all were unvaccinated, and living as they do huddled together in the shanties, one case soon spread it to the rest of the camp, and, as a matter of fact, camp after camp was attacked without one case being ill enough to call in the services of a physician. These men had suffered from "la grippe" when it was epidemic, and here was a disease in most instances not so severe; true, a few "pimples" appeared afterward, but on the whole they felt better and work was resumed—the pimples were of no account. And it was not until February, 1891, that a case reached the notice of physician, who recognized the true character of it, that the provincial authorities were apprised of the fact.

From New Ontario the disease spread to the older portions of the Proince, and has remained with us ever since, although it was virtually wiped out in the place where it first began, for the few cases occurring during the

past two years have been directly traceable to an outside origin. The work done in New Ontario by the Provincial Board of Health is an example to all municipalities, for nothing was done except in conformity with the Act and Regulations; none of these was exceeded in any one particular. To their strict enforcement alone is due the results just stated, and I feel satisfied if the local authorities will but enforce the various provisions of the Act and Regulations, similar results are bound to follow when an outbreak is threatened.

The returns for the several years are as follows:

	Cases.	Deaths.
1900	300	11
1901	1,838	7
1902	2,797	12
1903	820	21
1904	309	4
	5,765	51

which is record of 5,765 cases, with 51 deaths, and a case mortality of 0.88 per cent.

To emphasize the fact that the disease has heretofore been of a severe type, I would quote the words of Dr. Moore, the historian, of smallpox. He says:

"The confession that must be made is mortifying to a professional man, for, according to such records as we possess, it appears that, in spite of all medical exertion, the mortality of smallpox had progressively augmented. It has been made evident by calculations from the bills of mortality of the City of London, renowned for medical science, that at the beginning of the eighteenth century about one-fourteenth of the inhabitants died of smallpox, and during the last thirty years of that century, when the practice in smallpox was highly improved, the mortality by this disease had augmented to one-tenth.

"But this immense and increasing consumption of human lives was not the sole evil produced by this distemper, for a considerable proportion of the survivors were pitted and disfigured; some lost one of their eyes, a few became totally blind, and others had their constitution impaired, and predisposed to a variety of complaints, which were productive of future distress, and sometimes of death. These additional calamities cannot be reduced to calculations, but as the mortality from smallpox was continually on the increase, these concomitant evils must have been so likewise."

Coming to recent dates we find the type of the disease in the City of Montreal, in 1885-6, and of which Osler in his "System of Medicine" writes, was of a like similar character to what preceded it. There were 3,164 deaths, and of the 1,332 treated in the hospital, 418 died, a fatality of 31.3 per cent. In Ontario, during the years 1884-99, the following is the record of cases and deaths:

Year.	Place	Cases.	Deaths.	Per cent.
1884	Hungerford Township	202	67	33.0
1885	Province (Generally)	146	16	10.9
1889	Elgin County	49	13	28.9
1899	Russell County	30	9	30.0
		429	105	24.45

Or an average mortality of 24.45 per cent.

For the more careful study of the disease the accompanying illustrations are appended. The cuts are made from photographs taken in different portions of the Province during the past five years, and are fully illustrative of most of the types that have been met with.

Nos. 1, 2 were amongst the first cases quarantined at Sudbury on suspicion after the disease had been prevalent for some months though incorrectly diagnosed. No. 1 shows a few pustules on the exposed parts, while in No. 2 is illustrative of the disease of the discute type in the pustular stage and had been diagnosed as of specific origin—neither of the patients (1, 2) had been vaccinated and both contracted it from the same source.

Nos. 3, 4, 5 are of a shantyman (unvaccinated) in whom the disease ran a very severe course, the secondary fever running over 104° F. In No. 3 the rash is shown just as the vesicles are changing to pustules. No. 4 is that of the same patient in the stage of desquamation while the pitting is well seen in No. 5, taken the day the patient left the hospital.

The next three illustrations show the progress of the disease in the same patient (also unvaccinated). In No. 6 some of the vesicles are assuming the pustular appearance; in No. 7 the disease has advanced to the pustular stage while in No. 8 the inflammatory condition found in the stage of secondary fever is well illustrated.

The examples, 9 and 10, are father and son, both unvaccinated, who both contracted the disease from another member of the family—in whom it had been diagnosed chickenpox. The child had but few pustules, while in the father the disease was quite typical—they were both in the same stage of the disease.

The patient 11 and 12 was a shantyman, (unvaccinated), the first illustrates the vesicular stage which is shown very well on the face. And in the second the pustular stage is quite marked. The brooch on the pomum adami is interesting as showing how the discrete vesicles in 11 become confluent pustules at the late stage.

In No. 13 (unvaccinated) is seen a good example of the aborting of the pustules on the face, presenting a condition which has frequently led to a diagnosis of chickenpox. On the hands the disease is seen in as the well marked pustular form, some of the pustules being confluent.

The next illustration, No. 14, unvaccinated, shows in a very marked manner a common form for the eruption to assume. In this case the papules developed into elevated cones crowned with acne-like black spots which were accumlatives of seropurulent fluid. These subsequently dessicated, leaving the solid portion like warty excrescences which, however, subsequently disappear. These "black heads" are seen more markedly on the head, some few can be seen on the back of the hand.

The next two Nos., 15 and 16, show the eruption as it appears on the twelfth day when the patient, an Indian (unvaccinated), had a secondary fever of 104° F. The general distribution on the face is well shown, while No. 16, taken the same day, is a good example of discrete smallpox as seen on the forearm and hands, though No. 17, (unvaccinated) is perhaps more typical of the general run of cases as they have been seen in Province. All of the last seven illustrations were of shantymen quarantined in the Government Hospital at Sudbury.

The next illustration No. 18, is that of a patient whose case was diagnosed at New Liskeard as suffering from impetigo contagiosa, and is given

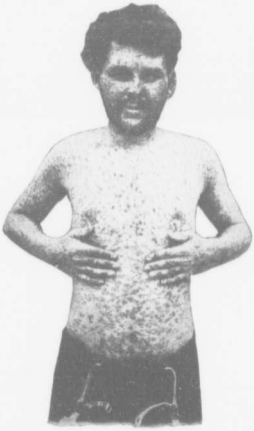
to the profession as a warning. To any one at all familiar with both diseases there can be no doubt as to it being a case of discrete smallpox, and from the appearance of some of the pustules on the face it would seem as if some of them simulated the condition described as being present in No. 14.

The remaining illustrations are of cases of smallpox which happened in the eastern portion of the Province, Nos. 19 and 20 being those of a brother and sister, both unvaccinated, and exposed to the same infection. The little girl is a typically mild form of which no doubt there have been thousands in the Province, while the brother presents the disease in a more marked form. The pustular stage as shown on the hands being in contrast with the character of the rash as found on the face where it has aborted. The contents of the vesicles having become muco-purent and in some places presenting the appearance of crusts.

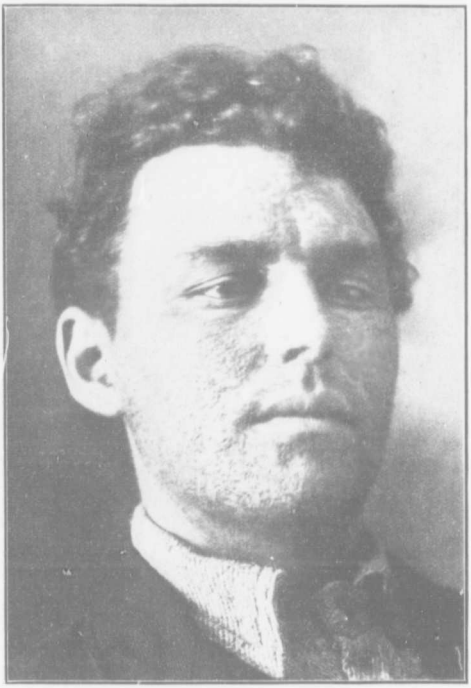
No. 1. Case in Sudbury Isolation Hospital.

No. 2. Case in Sudbury Isolation Hospital, pustular stage.

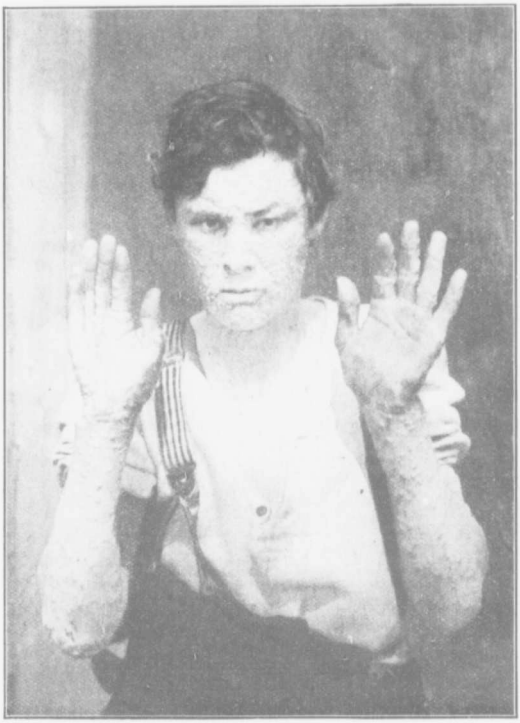
No. 3. A shantyman (unvaccinated), early pustular stage.



No. 4. Same case, desquamating.

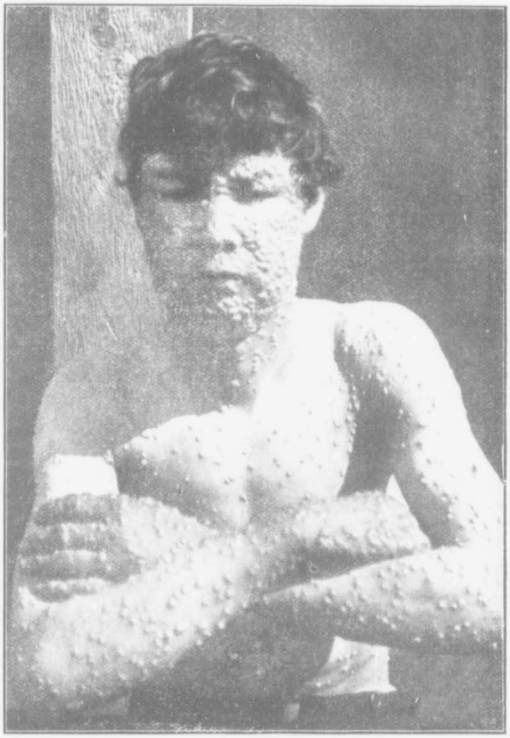


No. 5. Same case, showing pitting.

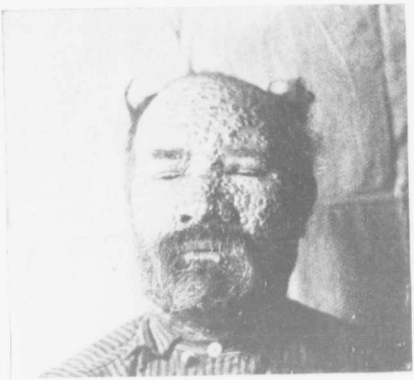


No. 6. Patient unvaccinated, late vesicular stage.

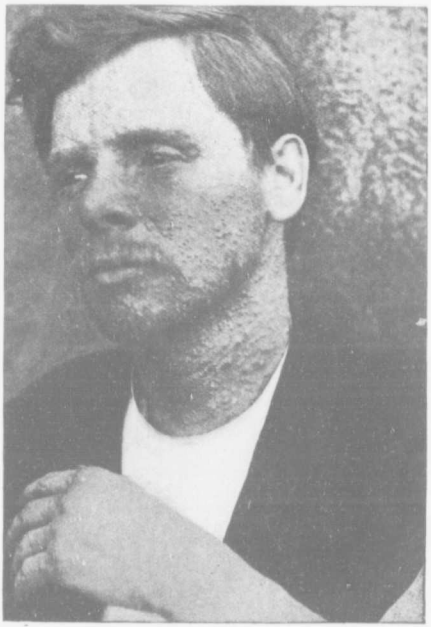
No. 7. Same patient, pustular stage.



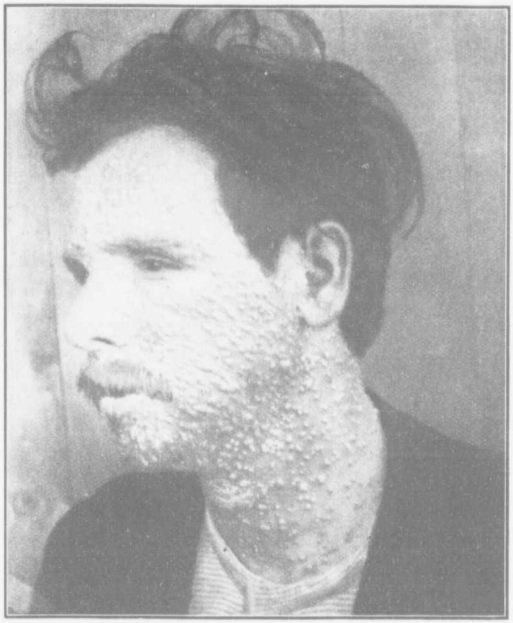
No. 8. Same patient, showing extensive inflammation.



Nos. 9 and 10. Father and son (both unvaccinated), same infection.

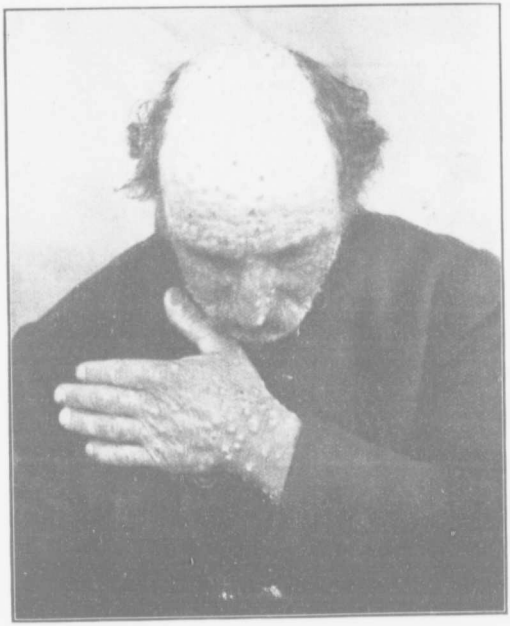


No. 11. Illustrates the vesicular stage of eruption.

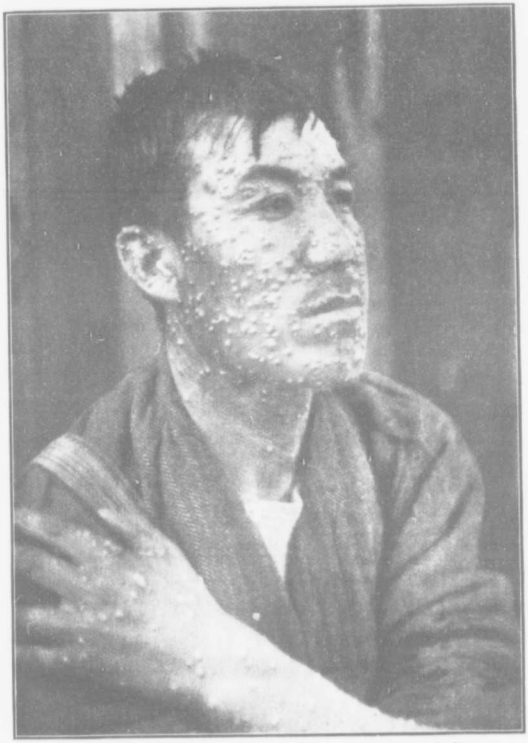


No. 12. Same patient, in pustular stage.

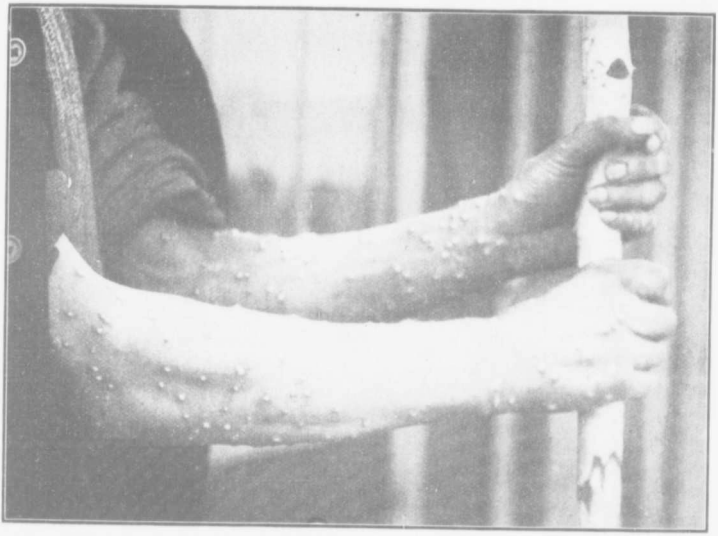
No. 13. The contrast between eruption of hands and face are well shown.



No. 14. An example of acne-like form with inflammatory base.

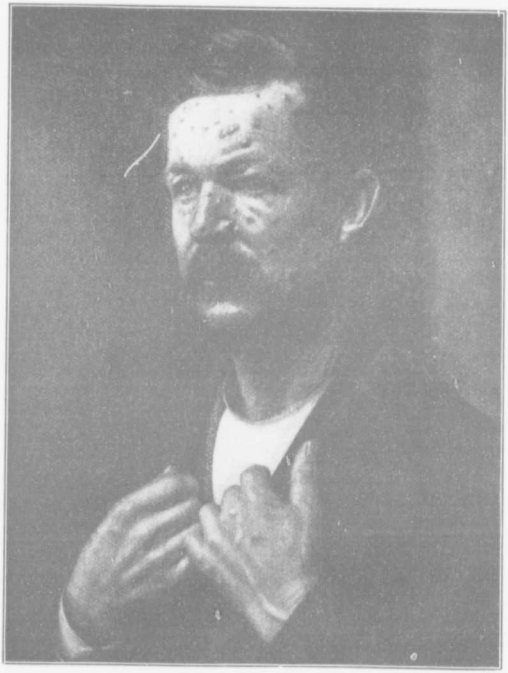


No. 15. The pustular stage as seen in an unvaccinated Indian.

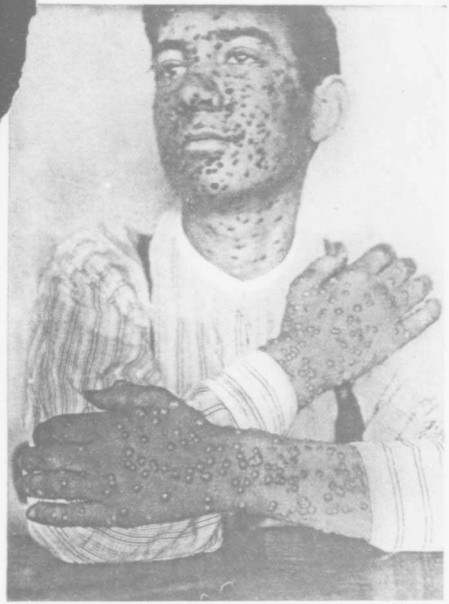


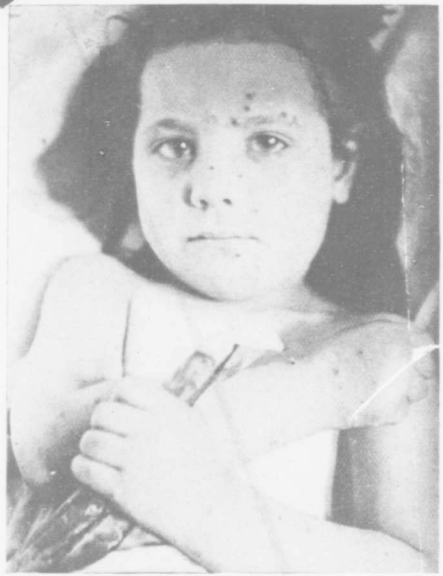
No. 16. Same case, showing distribution of eruption on forearms.

No. 17. An example of a discrete case in pustular stage.



No. 18 Example of case of smallpox incorrectly diagnosed as Impetigo Contagiosa.





Nos. 19, 20. Brother and sister (both unvaccinated), the former shows the aborted condition of rash on face, and well-marked pustules on hands. Sisters case mistaken for chickenpox.