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## CASES OF ARSENICAL DERMATITIS.<sup>1</sup>

BY JAMES C. WHITE, M. D.,

*Professor of Dermatology in Harvard University.*

CONCERNING the possible effects of arsenic upon the skin we have a great number of recorded observations, from which it appears that nearly every form of eruption which it is capable of exhibiting in its most varied forms of disease has occurred after the administration of arsenic, and has been attributed to it: macular and erythematous efflorescences, papules, vesicles, and pustules, wheals, furuncles, and ulcers, scales, petechiæ, and pigment deposits. These have presented themselves as local manifestations of cutaneous disturbance, or universally distributed, or have simulated in their arrangement and course distinct forms of dermatoses, as the exanthemata, erythema, erysipelas, herpes, zoster, eczema, pityriasis, psoriasis, etc. Such are the phenomena which, it is claimed, have followed the internal administration of arsenic. Its action upon the cutaneous tissues may, however, be regarded as possibly always a purely local one, inasmuch as it is excreted in part by the glandular structures of the integument.

As to the effects produced by it when brought in contact with the skin in any form from without we have less positive information. Applied purposely as a caustic we know that it causes, in combination with other substances, a rapid destruction of the cutaneous tissues, or that, on the other hand, its action by dilution may be limited to that of a simple depilatory. As

<sup>1</sup> Read at the meeting of the American Dermatological Association, August 27, 1884.

employed by workmen in the numerous arts in which it is used, its effects upon the skin are of all degrees of intensity from a fugitive erythema to deep-seated gangrene, and varying in extent of distribution from the limited ulceration about the nails of the taxidermist to widespread forms of dermatitis of all grades. It is my purpose in this paper to present brief notes of three cases of dermatitis, the first two of which were undoubtedly the result of direct contact with green arsenical paper, while in the third case the ætiology is so much a matter of doubt that it furnishes the reason for offering this communication to your criticism.

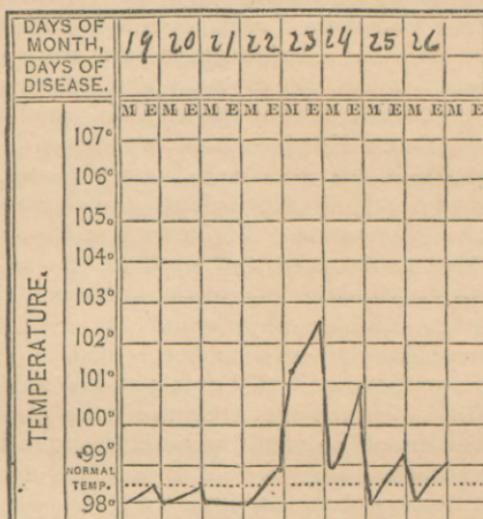
CASE I. A few years ago a medical student consulted me about his hands. The palmar surfaces were universally occupied by vesicles buried deeply beneath the thick horny layer, as closely approximated as possible without becoming confluent, and varying in size from a large pin's head to a medium-sized pea. They presented with their semi-translucent coverings that peculiar boiled-sago-like appearance considered to be characteristic of the so-called dysidrosis, of which pseudo-dermatosis it might have been taken as a good example. The pressure of the imprisoned fluid produced but a slight bulging of the cuticle overlying the individual efflorescences, but towards the lateral surfaces of the fingers the lesions became more prominent, and in the more yielding epidermis between them well-developed, elevated vesicles. There was considerable general thickening of the integument with much burning and itching. All these manifestations of an acute dermatitis reached their height of development in three or four days, and subsided in the course of the following week, leaving a somewhat prolonged desquamation of the palms, corresponding to the depressed roofs of the vesicles in their stage of involution, none of which were able to discharge their fluid contents. An investigation of the possible exciting causes of the trouble showed that the patient had been using, a few evenings before the onset of the inflammation, a pack of

playing cards, the backs of which were covered with a large amount of arsenical green, and I had no doubt that the dermatitis was the result of such contact.

CASE II. On the 19th of March, this year, my opinion was asked with regard to a patient applying for admission to the Massachusetts General Hospital, from which he had been discharged "well" twelve days previously, after five weeks' residence on account of "anæmia and general debility." He had been at work for a week, but for two days his mouth had felt sore, and he had noticed red spots upon his hands and fore-arms. When I saw him these parts were swollen, and presented numerous erythematous patches, which in some parts had already passed into papular forms of inflammation. His face was very red and greatly swollen, so that his eyes were nearly closed. The ears were of nearly double their natural thickness, and were discharging serum. The œdema and redness extended downwards upon the neck as far as it was exposed to view only. There was also serous oozing and crust formation upon the chin.

It was evidently a case of severe artificial dermatitis, the exciting cause of which was not learned at that time. The ill-defined limits of the inflammation, the want of tenderness on pressure, and the slight constitutional disturbance showed that it was not erysipelas. On the following day, the 20th, the face presented a more general incrustation, and there was free oozing of serum from its surface. The eyes could be opened partially. On the 21st the skin of the face and neck remained as before, but the backs of the hands and fore-arms were covered with serous and sero-purulent vesicles. On the 22d the face was still more crusted, and the hair was falling in great quantity from the whole scalp. On the 23d the vesicles upon the hands and fore-arms had increased greatly in number and size, and by confluence some groups had been converted into large, prominent bullæ. There was some oozing from these parts, and crusts were beginning to

form upon them. In the evening the patient's condition had become so much aggravated that I was sent for. The face was so swollen that it seemed ready to burst, and, indeed, was discharging serum profusely from numerous points. The eyes were entirely closed. The hands and arms were of enormous size, and were also dripping freely. There had been a great rise in body temperature through the day, and, as shown by the accompanying chart, it was at my visit  $102.5^{\circ}$  F.



The pulse was 100. The patient appeared to be in a very dull mental condition, and made but little complaint. On the following morning, the 24th, there was a free general sero-purulent exudation from the face, and the temperature rose again in the evening, but only to  $101^{\circ}$  F. From this time the inflammation of the skin subsided slowly. On the 28th the eyes could be opened, and the face was nearly free from crusts. On April 7th the patient was discharged well, although the skin of the parts affected was still reddened and desquamating.

It was learned during his illness that he had been engaged for three days previous to the appearance of the cutaneous symptoms in fastening pieces of white webbing into sample books, the paper linings of which were covered with green arsenical pigment, as determined by chemical analysis. I have seen one other case of severe dermatitis of hands and arms in a boy engaged in manufacturing elastic suspenders, but could not learn whether the fabric contained the poison. In this case, the most advanced form of cutaneous inflammation that I have ever seen of such artificial nature, and the only one accompanied by constitutional disturbance of any marked degree under my observation, there can be no doubt that the cause of the dermatitis was the arsenical paper. That other workmen employed in the same occupation were not affected in a similar manner is in accord with the general law of individuality. Another exceptional feature in the case was the stomatitis and loss of hair.

\* **CASE III.** In the last week of November I was called to see a lady on account of an affection of the skin which presented to her attending physician some unusual features. She had given birth to her first child seven weeks previously, and had made a good recovery. The disturbance of the skin began to appear one week after rising from her confinement, and five weeks after delivery. It had been in progress, therefore, two weeks when I was consulted. At this time the whole trunk was thickly occupied by slightly elevated patches of a subdued red color, varying in size from a pin's head to a dime, circular or oval in shape, and covered with very thin, firmly adherent scales. Some of the largest and oldest patches had undergone involution at their central portions and had assumed an annular form. Upon the upper arms and thighs and upon the neck there were the same appearances, but less pronounced and abundant than upon the trunk. The subjective symptoms were a slight itching or burning of the skin of the parts thus affected, and there

was no constitutional disturbance excepting a mild chilliness, such as accompanies many acute dermatoses of the general surface of similar grade. The appearances strongly resembled those of multiple ringworm of the skin, and at the beginning it was thought by the attendants that the disease might be of that nature. It was also not unlike the earliest manifestations of some rare forms of psoriasis of rapid onset and general distribution, in which the scale formation is exceptionally slight. Several of the patches were scraped, and the epidermal cells thus removed with difficulty were carefully examined for the presence of fungous growth, but none was found. Acetate of potash was prescribed internally, and a cooling wash was directed to be applied to the skin.

From this time the disease extended but little more and gradually faded out of existence. Its period of evolution was three weeks, and of decline nearly as long. At the end of six weeks the skin presented no signs of the disease. The diagnosis made at the first visit was *pityriasis maculata et circinata*, and this opinion was adhered to during the subsequent observation of the affection; indeed the appearances and course throughout were typical of this uncommon dermatosis. As in other cases which have come under my notice, I was again impressed by the inappropriateness of the name applied to it by the French dermatologists who first recognized and described its individual character, inasmuch as the scales are a very subordinate feature in the appearances at any stage of the efflorescence.

During my early attendance upon the case my attention was called to the condition of the baby, then about two months old. It had been feeding upon a wet nurse, and was plump and of healthy appearance. During the preceding week there had developed a papular eczema upon the cheeks and a slight intertrigo behind the ears and in the folds of the neck. In spite of the treatment advised the disease increased rapidly

in extent and severity, the whole face presenting within ten days a papular eruption of vivid redness, confluent and excoriated, while a considerable portion of the scalp was affected to the same degree. Upon the neck the opposing surfaces of the integument within the deep folds were intensely reddened and excoriated at their juncture at the bottom of the furrows. In the folds of the axillæ, in the groins, and in several of the deep folds on the inner surface of the thighs the skin presented the same intense grade of intertrigo. Upon the lower legs there was an ordinary papular eczema.

I continued to treat the child from December 1st to February 6th by such methods as I am accustomed to use in similar forms of cutaneous inflammation, but with very little apparent success. One expects in infantile eczema more or less frequent relapses, and possibly an indefinite extension of the disease under treatment, but relapses imply a preceding improvement. In this case I never seemed to have it under temporary control even, and the intertriginous inflammation, which generally is easily managed, behaved as obstinately as the more advanced grades of the process. After the first two or three weeks the child's digestion became disturbed, and the stools assumed a bright green color and were overfrequent. It ceased to gain in weight also. The wet nurse was changed twice, the second one because she had several attacks of acute indigestion, but with the third, a florid, healthy woman in all respects, no improvement in the child's condition took place.

On February 6th the wall paper upon its room attracted my attention (the baby had at first been brought down-stairs for my inspection), and on analysis it was found to be highly arsenical. It was an old French paper, and the pigments were loosely laid on. The patient was removed to another room, and the nursery was repapered. An immediate change in the child took place. The intestinal discharges became

less frequent, and after a few days lost their green color; the intertrigo became at once less red and moist; and there was a gain in weight during the first week of three quarters of a pound. At the end of the second week another pound had been gained, the diarrhœa had wholly ceased, the intertrigo had disappeared everywhere, and there was only a little dry and scaly eczema left upon the cheeks. All these rapid changes ensued without any alteration in the treatment employed.

On the discovery of the arsenic in large amount upon the walls of the chamber the question naturally presented itself to me: May its presumably constant presence in the air of the room not have been the cause of these extraordinary dermatoses both in mother and child? What were the conditions which would warrant the conclusion of so direct a connection between them?

A young lady with an especially delicate skin lies for four weeks in a chamber the walls of which are heavily covered with an arsenical pigment loosely laid on. One week after leaving it for another apartment there is developed over a large cutaneous surface an inflammatory process of rare occurrence, so rare, in fact, that nothing whatever is known of its ætiological relations. As soon as this chamber is vacated by the mother the infant, who has spent the first month of its life in another apartment, with its wet nurse, is transferred to the arsenical room as its permanent nursery, and in ten days begins to present an inflammatory affection of the skin, one of most common occurrence at its age, but of an unusual type. Later it develops marked intestinal disturbances. Both sets of symptoms persist to an extraordinary degree, in spite of repeated changes of treatment and nurses, until the paper is removed from the walls, when the skin and intestines rapidly return to their natural condition. The first wet nurse did not sleep in the arsenical room. The second one was in the room nearly the whole day and night,

and had several attacks of vomiting and diarrhoea. The third wet nurse was in the house but a short time before the discovery of the arsenic was made. She remained well, as did the monthly nurse who had charge of the mother during her confinement and subsequently of the child for two months. The two latter nurses were especially strong women.

These are the facts. Do they furnish evidence for a suspicion that arsenic was a factor in these manifestations of disease in this household, or are they explicable on the theory of mere coincidence? If pityriasis maculata et circinata is a well-defined entity, what possible relation can arsenic have to it as cause? Eczema is one of the most common affections of early infancy; why look for any unusual agency in its production here? Has arsenic been known to produce such effects? As just stated, pityriasis maculata et circinata is a rare disease, and we have no data collected to explain its occurrence. I do not know that its association with arsenic in any way has been hitherto observed. It may be that this case furnishes a clue to the aetiology of others which have been reported, could the circumstances attending them be recalled. It certainly should be remembered in connection with those which shall be observed hereafter. With regard to the eczema in the child, it did present some very unusual peculiarities. Intertrigo in the summer months is very common as the only manifestation or in connection with other phases of eczema, but I have never met with a case in which it was so marked in every possible locality for its existence, or so little influenced by treatment in all. This feature in the winter is still more exceptional. Moreover its very rapid disappearance on the removal from the arsenical chamber was a most significant sequence.







