

chance of recovery. This is the treatment of cellulitis in the subcutaneous tissues, and if it could be effected without infecting the general peritoneal cavity it seems reasonable to hope that satisfactory results might be obtained. If the nature of the organism be ascertained the appropriate vaccine should be given, and probably these measures should be adopted even in the presence of a secondary peritonitis, together with cleansing of the peritoneal cavity by dry sponging and pelvic drainage if the amount of exudation is abundant.

Wimpole-street, W.

## TWO CASES OF ACUTE DERMATITIS DUE TO BICHROMATE OF POTASSIUM.

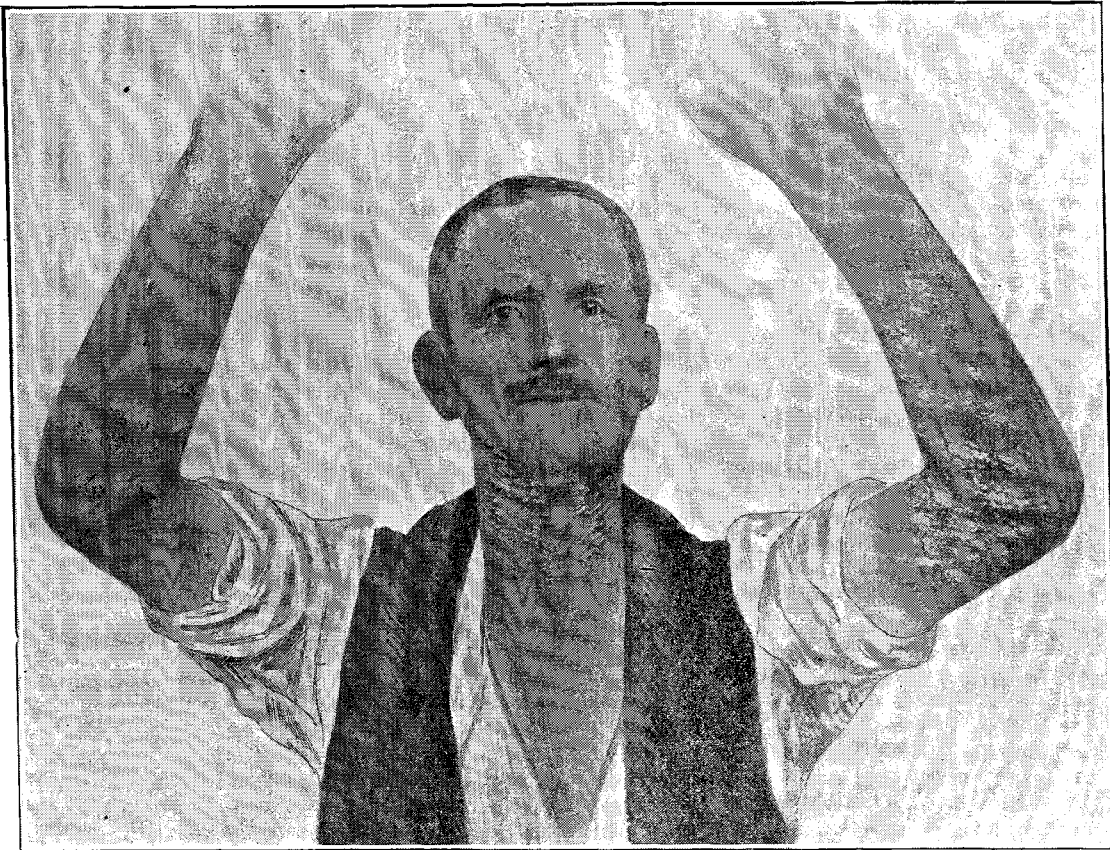
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ONE of these cases was kindly referred by my colleague, Dr. F. Rees, to the Skin Department of the Wigan Infirmary.

CASE 1.—The patient was a man aged 57 years. For six weeks he had been engaged in the dyeing of stockings. Sometimes he would work all day in the dye-house, but more

was open, under the chin, round the throat in a gradually narrowing line to the back of the neck, the whole of the face and back and front of the ears were covered with a bright red diffuse erythematous rash, in parts peeling in yellowish-white flakes. A few varying sized patches of healthy coloured skin were dotted about the extensor aspects of the arms and upon the forehead, especially towards the outer borders of the rash. The initial lesion appeared to be a scaly papule with a red spreading areola. At the inner sides of both elbows, particularly the left, the inflammation was most intense, and moisture was exuding freely from beneath the thin scaly crusts.

CASE 2.—A man, aged 30 years, was employed occasionally in the same room and at the same work as the patient above. This man developed no rash until after the end of three months. He never used gloves and lifted the hose out of the chrome vat with his naked hands. The rash affected his hands, arms, throat, and the under part of the chin, but never spread further; it was slightly itchy and occasionally sore. He said it never got hold of him severely, because on its first appearance he would either stay at home a few days or do some different kind of work. I saw him when he had been absent from work for nearly a week. There was then present redness of his arms, forearms, and front of the neck, with some thin desquamation; the palms of the hands were peeling in thick flakes. The palms of this man's hands were very moist, unlike those of the other man, which were very



A case of potassium bichromate dermatitis (Case 1).

usually for a few hours only three or four days in the week. Up to the end of the fifth week of his employment he saw no rash and felt no trouble or inconvenience. His arms then began to feel rough and his hands swelled. The back of the hands also felt itchy, but not severely so, and never at any time had he the least pain or smarting even when the rash was at its height. The rash underwent many remissions and exacerbations, depending upon whether he was employed in dyeing occasionally or for a longer period. At the same time that the rash appeared on the arms he noticed it also on the under part of the chin. The whole rash slowly disappeared if he left his work for a day or two. At the end of the seventh week he noticed that the inner surface of the elbows began to weep, and as the rash spread over the whole of the face he, being anxious, came to the infirmary.

The condition of the patient was then as follows. Upon the back of the hands, both forearms and arms as high as the rolled up sleeves, the front of the chest where his shirt

was open, under the chin, round the throat in a gradually narrowing line to the back of the neck, the whole of the face and back and front of the ears were covered with a bright red diffuse erythematous rash, in parts peeling in yellowish-white flakes. A few varying sized patches of healthy coloured skin were dotted about the extensor aspects of the arms and upon the forehead, especially towards the outer borders of the rash. The initial lesion appeared to be a scaly papule with a red spreading areola. At the inner sides of both elbows, particularly the left, the inflammation was most intense, and moisture was exuding freely from beneath the thin scaly crusts.

Both cases readily improved, getting quite well in a few weeks, under simple, soothing treatment.

*The process of dyeing.*—The stockings are first washed in a dolly tub with soap and cold water and are then rinsed and dried in the hydro-extractor. After this they are placed in the dye vat, containing  $1\frac{1}{2}$  pounds of bichromate of potash dissolved in 200 gallons of water, and are boiled for one hour. The stockings are stirred mechanically during boiling in the vat. The liquor is boiled by forcing jets of steam through the bottom of the vat into the liquor. When sufficiently boiled the articles are lifted out by a pole, about 5 feet in length, on to a moveable tray, which is then wheeled to the dolly tub into which they are placed, and

afterwards dried. They are next placed into a second dye vat, containing  $2\frac{1}{2}$  pounds of logwood in 200 gallons of cold water, and are again rinsed and dried. From three to six charges of bichromate of potash are weighed by these men during the day; at these times they use indiarubber gloves.

The dangerous parts of these processes would appear to be, first, the weighing of the chrome; this is very unlikely to be the cause of the rash, as it is only done occasionally. Secondly, the continual standing over the boiling chrome vat whilst removing the stockings, and continual exposure to the steam in the dye-house. The injurious effects due to the manufacture of bichromate of potash and chrome lead dyes are well known to experts in industrial hygiene, and stringent regulations are enforced (*vide* Dr. T. M. Legge's article in Oliver's "Dangerous Trades"), but I am not aware that this particular form of dermatitis has been reported in medical literature, although I am informed that it is of common occurrence amongst unskilled workers in this particular process.

The men worked in trousers and shirt (shirts unbuttoned at the throat), and were engaged for considerable periods of the day, standing over the boiling chrome vat. Much steam was generated, and condensed as warm water upon the uncovered surface of the skin. Particles of bichromate of potash are carried up in the vapour from the boiling liquid of the vat. The inflammation is very severe at the bend of the elbow. This was particularly noticeable on the left arm of the first case. His left arm would be held during work much nearer the surface of the liquor, as with this hand he held the centre of the lifting rod, and with his right the end of it. The man wore long gloves reaching above the elbow, and the condensed solution of bichromate of potash would trickle to this part, be confined by the rubber gloves, and cause irritation by the friction of the gauntlet.

That particles of bichromate of potash are carried up by the steam is shown by the following experiments; they confirm similar ones carried out by Dr. Heise in Germany. I was not aware of his investigations until after those cited below had been performed. Bichromate of potash is not a volatile body, and therefore can only be carried mechanically in the steam. To settle this question a steam-jacketed copper pan was filled with bichromate solution within three inches of the brim, and over the same were arranged, parallel to the surface of the liquor, strips of white blotting-paper at intervals of 3 inches, ascending to the height of 2 feet from the surface of the liquor. Steam was then turned on, and the contents were vigorously boiled for one hour. Afterwards the strips of blotting-paper were examined, and it was found that they were stained in varying intensity up to the height of 18 inches, thus showing that particles of liquor were carried up with the issuing steam. This experiment was repeated three times and in each case the limit of the chromate spray varied from 15 to 18 inches. The height to which the spray can ascend no doubt will depend upon the size of the pan, rate of ebullition, local conditions of air currents, such as draughts, and the ventilation of the dye-house.

A noteworthy point in the clinical history of these two men is the very slight subjective symptoms complained of. Chrome sores are well known to be painless, and in these cases we have a severe and extensive inflammation of the skin, with very trifling feelings of irritation. Dr. Legge says that this salt in solution does not attack the unbroken skin. Generally speaking, this statement is quite correct, but the above cases prove that if associated with heat and moisture its activity is greatly increased. Any crack or sore into which the salt gains access may develop into the indolent chrome ulcer, and it is interesting in this connexion to inquire why chrome ulceration is so common an occurrence on the septum of the nose in men who work in an atmosphere of chrome dust.

Dr. Legge states that this particular "site of election is due to deficient blood-supply in this special piece of cartilage." The first symptom perceived when working with powdered chrome dust or entering a room containing it suspended in the air is itching or more severe irritation in the nose, sometimes accompanied by sneezing. The vibrissæ of the nasal openings are very efficient filters. I have shown elsewhere ("Catarrhal Fevers") that healthy nasal mucous membrane beyond the vibrissæ is sterile in man and animals. If such comparatively light things as micro-organisms can be prevented from penetrating further, denser particles will

be the more readily. The orifices of the noses of workmen do not usually get carefully cleaned. Thus, the continual breathing of the dust-laden air would result in the constant presence of an accumulation of chrome dust at this particular place; here also are found heat and moisture, the ideal conditions necessary to set up irritation and ulceration.

To remedy the risk of exposure no person should be allowed to bend or work over any open structure containing a boiling solution of bichromate of potassium within a distance of a few feet. Any instrument used to lift out articles from such solution should be provided with a flange to prevent the liquid running down upon the hands. Each workman who comes in contact with either the wet solution or dust ought to wash the parts exposed, and amongst others the orifices of the nose, with a reducing agent, such as a weak solution of bisulphite of soda. This should specially be enforced as a matter of routine when work is done. This precaution is considered so important in some well-regulated works that each person employed before leaving has to sign a paper to the effect that this regulation has been complied with. Greasing the skin is said to be helpful in preventing this form of dermatitis.

Wigan.

### A CASE OF SPINAL MENINGOCELE; OPERATION WHEN FORTY HOURS OLD; RECOVERY.

BY R. LEONARD LEY, M.B. CANTAB.

I SAW the following case in consultation with my partner, Mr. William Wyllys, on Sept. 14th, 1909, when he gave me the following history:—

The patient, an infant, was born on the evening of Sept. 12th, and at birth he noticed a mushroom-shaped swelling over the lumbo-sacral vertebræ which swelled up when the child cried, forming a globular mass of the size of a fives-ball. The greater part of the tumour was covered by healthy skin, but in the centre was a circular transparent portion, and on looking through it a black hole could be seen at the bottom, which he took to be the channel by which the sac communicated with the spinal canal. He covered the tumour with a pad and bandage, but as it grew rapidly larger, and was obviously in danger of bursting, he got me to see the case to judge as to the desirability of operating.

When I saw the child the mass was of the size of a tennis-ball, and the skin at the thinned edge where it joined the clear portion formed by the meninges had commenced to ulcerate. The baby, a male, was well formed and healthy. There was no deformity of the feet, sensation was normal, and the deep and superficial reflexes were normal. From the absence of dimpling and any sign of the cord when looking into the sac, I concluded that the case was one of meningocele rather than meningo-myelocele, and the absence of deformity and the normal sensation and reflexes were, I thought, against the diagnosis of syringo-myelocele. I decided to operate at once on the grounds that if left alone the baby must inevitably perish from rupture of the sac, and that if he survived an operation for removal of the sac there was no reason why he should not become a healthy and useful member of society.

At the operation Mr. Wyllys gave chloroform and ether by the open method, and the child was placed with his belly on a pillow and with his head hanging over the edge of the table, so that as little cerebro-spinal fluid as possible should escape. A nurse held the legs during the operation. I opened the sac away from the middle line, in case my diagnosis was incorrect, and having confirmed it, continued the incision to the base of the tumour and cut away the whole sac flush with the skin of the back. There was now left a large circular wound with a diameter of about  $2\frac{1}{2}$  inches, and in the centre was an island formed by the base of the meningeal sac about 1 inch in diameter. In the centre of this was a valve-like opening closed by a fold of the sac in its collapsed condition, through which cerebro-spinal fluid gushed with each breath of the child. This, no doubt, when the sac was tense corresponded with the round