Fig. 5, Case 3.—Very marked pigmentation, with branny desquamation of pigmented scales; wasting of arms from atrophic paralysis.

am inclined to think it may cause some mental confusion, but certainly not to the same extent as we ordinarily find in alcoholic paralysis.

Fig. 6, Case 3.—Showing marked wasting of anterior tibial and peroneal muscles of legs.

As regards the duration of the present epidemic, I think I can trace it back for over twelve months, for during this period I have been much struck and puzzled by the number of cases of pigmentation occurring at Crumpsall.

Treatment.—I trust I may be allowed to endorse, with a few exceptions, the most wise and excellent account of the treatment of these cases given by Dr. Judson Bury in the BRITISH MEDICAL JOURNAL for December 8th. The exceptions are that having seen such alarming heart symptoms and such feebleness of the pulse with low tension at Crumpsall, I should hardly like to give such depressing drugs as salicylate of soda and iodide of potassium, even though the latter drug is said by Sir William Gowers to aid in the elimination of the arsenic. For the same reason I should not recommend antipyrin or exalgin for the pain, though phenacetin might possibly be "safer." In the early stages we have been content with rest in bed, a little digitalis, tonic doses (3 or 4 minims) of liq. strychninæ, bismuth, and soda if the stomach symptoms were prominent, and carbonate of ammonia and senega for the bronchitis; for the pain, small doses of morphine have seemed to us to be the best treatment. With these exceptions, let me again say how cordially I agree with what Dr. Bury has said.

Finally, I must thank my assistants, Drs. Sissons, Anderton, and Judson, the resident medical officers at the Manchester Workhouse Infirmary, for their great help in what has been and still is a most arduous task.

Photographs of 3 cases, showing various types are here reproduced. One woman (unpigmented) is of fair complexion, but in addition to the paralysis, has the typical keratosis of the soles of the feet.

THE STRENGTH OF THE HYPERTROPHIED BLADDER.

By D. W. SAMWAYS, M.D., D.Sc. M.R.C.P.,
Mentone.

THE strength of the hypertrophied bladder, if I may judge from the descriptions given of it, would appear to be no greater as a safeguard against rupture than that of the bladder normally. Obviously, if this be so, the risk of rupture becomes considerably increased. The distribution of the muscular coat leaves the impression that "the mucous membrane between the fasciculi is insufficiently supported," and that the bladder hypertrophies foolishly, and to its own hurt.

A consideration, however, of the thin rubber ball covered with netting commonly attached to a spray apparatus should correct this impression. Such netting not only prevents a too great expansion of the ball, but materially strengthens the rubber seemingly unsupported between its meshes. Each little sacculus of rubber as it bulges out forms the segment of a sphere whose diameter is many times smaller than that of the rubber ball itself, by which without the netting it would alone be supported. The netting allows the sacculus to form, and pulls its walls inwards. Without the netting no succulus could form, and the walls of the same segment of rubber could only be supported by the almost tangential force of the adjacent rubber, which would have to be very great to afford a sufficient radially directed pressure-component to resist the outward pressure. The fasciculi, therefore, by altering the direction of pull, save the rubber from being exposed to a strain which otherwise would have increased as the pressure augmented, and *ceteris paribus* in the same proportion.

The strength of a segment is increased in the inverse ratio of the size of the sphere of which it forms part. Thus if when not fasciculated the bladder have a diameter of 4 inches, the force required to burst a certain segment of its walls may be represented by s . If, without the bladder altering in size, the segment be supported between muscular fasciculi so that the segment now is part of a sphere whose diameter is 1 inch,

the bursting force now becomes S , and $\frac{S}{s} = \frac{4}{1}$.

When the bladder, therefore, hypertrophies, its whole wall is strengthened. The interfascicular spaces, by becoming sacculated, are put into what is economically and mechanically the most ideal condition for supporting pressure. When large sacculi develop, or spontaneous rupture occurs, the causes are probably additional pathological complications rather than errors in mechanical principles during hypertrophy.