be removed. The risk entailed by operation can be reduced very materially by first relieving the toxic symptoms by connecting the divided ileum with the sigmoid or rectum, and later, when the general condition of the patient has improved in consequence of this procedure, the large bowel can be excised if the symptoms demand it. I do not pretend that removal of the large bowel is not a very serious operation in certain circumstances. Indeed, in many of these patients any serious operation must be regarded as being dangerous to life, the danger varying chiefly with the degree of toxicity. I may say that in these and similar cases the risk can be very materially reduced by the subcutaneous injection of a large quantity of normal saline solution immediately before the operation. By this means the patient appears to suffer a minimum of shock from the extensive operative procedure, and vomiting either does not follow it, or should it do so, it is trivial in character. In these cases the absence of vomiting is a matter of very great importance. It was very frequent and severe after my earlier excisions of the large intestine, and was the cause of more than one fatal result. Besides the distress and depressing influence it exerted on the patient, the constantly recurring strain on a long wound was very liable to render it insecure or to determine the development of a septic infection in it, which would probably not have occurred had the recently incised structures been kept at rest. The risk of an infection starting in the peritoneal cavity appears to be very small. The mode in which the subcutaneous transfusion of normal saline, employed immediately before the operation, acts has been very clearly demonstrated by Dr. Crile's most interesting and valuable researches on the production of shock, of which America must be very justly proud.

HYPERTROPHIC OSTEO-ARTHROPATHY OF HANDS WITHOUT VISCERAL OR CONSTITUTIONAL DISEASE.

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J. L., the subject of the deformity illustrated by the accompanying photographs is a man, aged 47, one of a family of fifteen. One brother was born with two toes fused on one foot, the other foot normal. There is no history of any other abnormality in the family. The parents were not related in any way. The father was a very big, strong man, and is said to have been "double jointed" in the hands. He was a smith. J. L. was born with hands apparently natural, except that the middle finger of the right hand was crooked at the top joint. At 2 years of age this and the index finger of that hand, and the same two of the left hand, began to grow out of proportion to the general rate of growth, and the enlargement was most marked from the eighth to the fourteenth year of age. From the sixteenth year of age they have not hypertrophied further, but only taken part in the general growth.

The only movement now possible is at the metacarpophalangeal joint of the deformed fingers (the other fingers and thumbs having normal movement), all the other interphalangeal joints are ankylosed. At most of these joints (see photographs) there are large craggy nodosities, which feel cartilaginous, and over the dorsal surface of the

metacarpophalangeal joints of the first and second fingers of the left hand and middle one of the right are to be felt movable bodies, evidently cartilaginous, of $\frac{1}{2}$ in. to $\frac{3}{4}$ in. diameter, and one or two smaller pieces like "melon seed bodies." The enlarged fingers are transparent-looking at the more distal portions, and traversed by fine pink-coloured venules. The palms, especially the left, have huge pachydermatous pads, well seen in the photograph; the smaller pad next the thumb can be picked up, and has a thick, broad pedicle. The man generally carries his hands in his pockets. He is a boot finisher by trade, and says he can make a good living by it when work is plentiful. He has refused any operative interference.

BIOTRIPSIS, OR LIFE-WEAR: TROPHIC CHANGES IN OLD AGE.

[WITH SPECIAL PLATE.]

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THE appearance of the skin in an old person varies in different parts of the body. In this article I propose to call attention to the skin which has been subjected to the greatest exposure of the wear and tear of life. Dr. Head and Mr. Sherren have alluded to them¹; but, although I cannot find definite reference to them as a whole, there can be no doubt that the appearances are not described now for the first time. The changes in the greatly exposed skin are so marked that I think the general condition deserves a term to itself, and I propose "biotripsis" (life-wear), and to speak of a process of biotriptic changes. The condition is important from another point of view, for on the parts where it is most marked there is prone to occur papillomata and cancer.² Hence, if it could be shown that biotriptic changes are related to neurotrophic changes, the demonstration would support the two theories:

1. That a neurotrophic disturbance is concerned either directly or indirectly with the genesis of cancer.
2. That a neurotrophic influence bears upon the direction and limitation of the spread of cancer.

The biotriptic changes are observed most commonly upon the backs of the hands, the temples, and the foreheads of old people, but I have seen some of the changes upon the lower lips, cheeks, forearms, and occasionally elsewhere. The skin becomes shiny, smooth, thin, inelastic, pigmented, and apparently scarred, although the last cannot be explained by solutions of continuity of which there is no history.

The skin which shows the changes to best advantage is that which covers the second metacarpal bone and its immediate neighbourhood. The coloured plate which accompanies this article reproduces the most marked state in which I have seen this condition. It shows the backs of the hands of an old woman, aged 72. She did not complain of her hands, and had noticed nothing peculiar about them until she found I took an interest in them. She has never suffered from "chapped hands," nor has there been a solution of the skin's continuity. For the main part of her life she has been the wife of an agricultural labourer, and her duties have been domestic and household. I showed these hands to a distinguished

HYPERTROPHIC OSTEO-ARTHROPATHY OF HANDS.

surgeon, and the first thing he did was to ask her, "How did you do this?"

The skin is shiny, smooth, inelastic. The subcutaneous

veins are almost subepithelial, there is a great degree of pigmentation, and there are in the most pigmented parts long radiating scars, which are more marked by loss of pigment than by the existence of cutaneous thickening. The condition is symmetrical; it is most marked in the region of the second metacarpal bone, and gradually fades away from this part. There is no similar change elsewhere on the hands. The tactile, heat and cold and pain sensations are not brisk, but it cannot be said that they are otherwise abnormal.

The condition very much resembles the bronzing of skin which has been subjected to prolonged exposure to the *x* rays. It is interesting here to remark that the two conditions are similar in another respect, namely, they are prone to be the seats of cancer.

It is difficult to account for biotriptic changes. In any country village in rural England many old people can be visited and the condition of their hands observed; it will be seen that they show great variety in the degree in which many of the biotriptic changes are present, although all their lives they have been exposed to prac-

Fig. 1.

Sir Victor Horsley has given me leave to publish a very interesting case which is under his care, and I take this opportunity of thanking him. The case bears upon the relation of nerve supply and pigmentation. Fig. 1 shows the head of a little boy whose right forehead is bald, the bone atrophied, and the skin pigmented in the region supplied by the supraorbital nerve of that side. Ten years ago he knocked the upper margin of the right bony orbit against the handle of a door.

It is a curious case from many points of view, and it makes one wonder that cutaneous pigmentation does not occur with greater frequency after operative and accidental traumatism. Whether pigmentation can be associated in any way with the cancer process is an undeveloped question. It is well known that pigmented cancer is a highly malignant type of cancer. Does the presence of the pigment in the malignant epithelial cells mean that they possess great resistance and vitality?

It appears from P. Carnot's experiment that the normal pigmented epithelial cells of variegated guinea-pigs possess greater vitality or resisting power than their white epi-

Fig. 2.

tically the same wear and tear of life. Hence the same wear and tear of life can induce in different skins different degrees of the biotriptic changes.

Skin which has been deprived of its nerve supply becomes smooth, shiny, inelastic, and atrophied, and in herpes zoster it is scarred. With regard to the relation between pigmentation and nerve supply there is much evidence to show that it may be close. But from the evidence at our disposal we cannot state definitely whether disturbance of nerve supply (1) induces an intracellular manufacture of pigment, (2) or whether it induces changes in the blood vessel walls which allow diapedesis of red blood corpuscles, the pigment of which is deposited either outside the cells of the part, or even picked up by them and incorporated within them.

Anaesthetic leprosy, Addison's disease, melanoderma, leucoderma, moles, and the greyness of hair seen in the heads of people "turning grey"³ all indicate by their distribution or associated nerve lesions a possible connexion between pigmentation and nervous influences.

The action of the nervous system upon normal pigment is shown in Lord Lister's classical experiment⁴ in which he demonstrated that the change in colour of frogs when taken from the light into the dark and vice versa depends upon a reflex the afferent fibres of which traverse the optic nerves.

thelial cells when both kinds are grafted on to the same raw surfaces. There is at present no evidence to show that cancer is more frequent in negroes than in white races, nor can one say that the skin of brunettes is more liable to cancer than that of blondes, nor is cancer known to be more common on the most pigmented parts of the skin of any person, black or white.

Dr. Ironside Bruce has kindly sent me a case which bears upon this point. The patient is a woman, aged 60, and Fig. 2 shows that there is a rodent ulcer upon the internal extremity of the lower eyelid on the right side. The skin around the lower eyelid had become highly pigmented, especially at the point on which the rodent ulcer began, and some pigment also exists in a minor degree on the other side of the nose. This pigmentation had occurred some years before the appearance of the rodent ulcer.

Dr. Ironside Bruce's case is an example of what I mean, but it may be an exception to the rule, and more evidence is wanted on this point.

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