the heat of the water is of little consequence, and under the same degree of heat the formation depends on the intensity of the light. Plant-seeds allowed to grow in the dark are only developed to a certain extent; their leaves, &c., are found to be of a yellowish white, and their solid contents do not increase in weight, though their bulk may enlarge by the absorption of water; but if these plants are examined with care when exposed to the sunlight, they are found to be constantly decomposing the carbonic acid of the atmosphere, appropriating the carbon, and setting free the oxygen. For them to carry out this function they must be subjected to the light-giving rays of the solar spectrum, and in proportion to the illuminating power of the ray so do they perform this action. It is also found that the stomata (orifices in the cuticle of the leaves of the higher plants, for the admission of air, &c.) have two or more cells that guard their entrance, and perform the action of closing or of opening them; the former when the plant is in the dark, and the latter when light pervades the medium in which they are placed. These orifices perform for the vegetables in which they are found an analogous function to the sudoriparous glands of the animal. Thus, the green surfaces of plants grow towards the light, on account of the operations they have to perform under its influence; the roots avoid the light, as they throw out the carbonic acid by respiration; for if light is thrown on germinating seeds from below, the roots grow upwards, and the stems &c. downwards.

On animals the action of light is little known. It is evident it differs from that on vegetables in their first stage of nutrition, because animals do not perform any such acts of combination; but, by assimilating the vegetables themselves, obtain their nourishment so elaborately prepared for them by these, as it were, intermediate links in the chain or "circle of life." Animal surfaces do not therefore become so extended as those of the vegetable; still, there is no doubt that the health and well-being of animals do also in a great measure depend upon light. We know their colour is derived from its action, for the eyes and hair of the newly born are without any decided colour for days after their birth. When an animal has been found embedded in a stone it is transparent, and so sensitive that it will hide from the light if exposed to it. In the races of men where the sunlight acts upon their skin, we find freckles, a swarthy hue, and different degrees of pigmentary development up to black, according as there is more or less intensity in the light of the country in which they and their ancestors have lived. The pigment cells in the skin, to which the colour is due, are like true epidermis cells drying up and becoming flattened scales as they near the surface, thus imparting the blackness to it. They are best seen in their integrity when covering the bloodvessels of the choroid coat of the eye: here they present the polygonal form; each cell contains a nucleus, and the dark colour is caused by numbers of flattened round granules. Their chemical nature is not known; it is shown to resemble very nearly the cuttle-fish ink or sepia, which derives its colour from the cells lining the ink bag of the animal, and to have more carbon than most of the organic substances (about 58½ parts in 100).

Many researches show that light greatly modifies the development of animals, their health, and recovery from disease. Dr. Edwards has proved the first; for if tadpoles are properly fed, and have plenty of water, but are kept in the dark, he has remarked they never undergo the change into air-breathing animals, but remain fish,—large tadpoles. The appearance of animalcules in infusions of decaying organic matter is greatly retarded by being placed in the dark. If those animals which inhabit dark places, as the cockroach, are reared entirely secluded from light, they grow up almost colourless, like plants under similar circumstances.

Nations who inhabit hot climates, and wear little clothing, are remarkably free from deformity; on the other hand, those people who live in mines, in cellars, or in dark, narrow streets, have mostly misshapen and weakly children. This may be partly due to bad air, but greatly to insufficient light. Patients recover better from most diseases when their apartments are properly lighted. Even in health the effect of dark days is felt on the spirits of everyone, more or less.

The circulating fluid is the means by which all parts of the body are nourished. In man the blood's component parts are fibrine, albumen, corpuscles, saline matters, and ill-defined animal principles. When these sources are duly supplied, and when all the various organs and tissues abstract from it the special materials they need, a general balance is maintained in the system, and, as Mr. Paget has so well said, "each single part of the body, in respect of its nutrition, stands to the whole body in the relation of an excreted substance." But allow any of the rough materials for forming the blood to be too large or too small in quantity, or let an organ act imperfectly, and every part of the body becomes more or less unfavourably affected. In disease of the skin, its sensibility is greatly altered, according as the peripheral terminations of the sensory nerves in it are supplied with blood; anything that retards this supply diminishes their sensibility, and, if the flow be completely stopped, entire loss of feeling results, as in severe and prolonged cold. If there is a determination of blood to the surface, it becomes highly sensitive, and it is more easily acted upon by external stimulants, as cold, heat, light, &c.; the nerves being supernaturally supplied with nourishment, they convey to the brain perverted impressions. Thus the temperature of the part does not really increase beyond that of the left ventricle of the heart; but the greater impressibility of the nerves leads the patient to imagine it does; there is greater appreciation of the heat, and even magnifying of the degree. Pain also is due to their excited state, and to pressure upon the terminal branches by the dilated bloodvessels. In disease nature frees herself from the morbific poison by the action of the glands, and of these perhaps the most used are the sudoriparous and the sebaceous. It is by these the poison is eliminated in small-pox; but by their excessive action inflammation is set up, the nerves become hypersensitive, they magnify the effect of external stimulants, and by reflex action the inflammation of the part is increased, when thus exposed to what in ordinary circumstances would be but healthy and desirable stimulation; the reflex inflammation preventing the natural elimination of the disease, and the two causes increasing its severe symptoms. The tissues thus injured approximate to the condition of dead matter; and, as Mr. Lister as shown, pus is thus formed, which, being reabsorbed, causes secondary fever—that is, true surgical fever, as Mr. J. E. Erichsen says, "occurring only as a consequence of, and secondary to, local disease or injury." The stimulating action of light has a detrimental effect in this disease, and for this reason I have followed John of Gadsden's idea, excluding it from the patient in the eruptive stage. In practice I find the most beneficial results to follow, rendering what has hitherto been so dangerous and loathsome comparatively mild and inoffensive. It is wonderful to see a patient with severe confluent small-pox on face and body sitting up, with no fever, no head symptoms, no pain, enjoying her food, no itching, tingling, or bad smell, or, in fact, aught but a stiff, strange feel of the skin, which is described as "rather unpleasant," followed by no secondary fever and no other complications; and yet this is the history of a case I attended a few weeks back, and is the description of all, even the most severe cases.

What the chemical action of light may be, is not yet known. There is little doubt that both animals and vegetables depend upon it for their well-being in a far greater measure than is supposed.

March 30th, 1871.

EPITHELIUM AND SKIN GRAFTING.

BY R. W. GOLDIE,
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IT is well, I think, that not only the successful, but the unsuccessful, results of any new form of treatment should be made known. Were this course always pursued, many a so-called discovery for the relief of suffering humanity would long ere this have been relegated to the region of the unknown. But, as it is, we find the shelves of our medical and surgical wardrobes literally groaning under the load of so-called remedies—remedies whose very existence is due to casual contributions, narrating how that a case of tetanus, e. g., got well during the administration of so many grains

of chloral; or how a certain case or number of cases of acute rheumatism recovered while the poor patient was gulping down with religious punctuality ounces of mixed salts of potash; or, to give a third instance, how that—say—thirty cases of erysipelas recovered during the existence of which tincture of the muriate of iron was given freely and frequently.

Now, it may be well to publish long strings of cases of rheumatic fever that have been "cured" by alkalies; but I take it to be much better, both for patient and physician, if an equally long list, with equally good results, can be cited after treatment with mint-water; for if this means anything, it means they would have done just as well with nothing at all. Moreover, if rheumatism will do as well with mint-water as with alkalies, what a gain have we here—first, in relation to the patient, seeing we both treat the mind and give a palatable potion; secondly, with respect to our Pharmacopœia; and, thirdly, with regard to the cause of the disease. We have hitherto been combating acids in the blood. Mint-water is no antacid; yet the patients recover. A fourth example of the evil of getting into a groove, and conceiving that any divergence from it will be attended by evil results, is strikingly exemplified in the treatment of carbuncle. "Crucial incision" was once deemed *the* only method of curing carbuncles. Mr. Paget, in a clinical lecture published in THE LANCET of Jan. 16th, 1869, pretty conclusively shows that there is no particular good to be derived from the crucial incision—received by tradition from our predecessors.

I make these few preliminary remarks to show the necessity of sifting and weighing well the evidence in favour of any form of treatment before adopting it, and also because they tend to prove that from most unlikely remedies we get often the very best results. Dr. Fiddes, in THE LANCET for Dec. 17th last, suggested the scraping of epidermic scales from the outer surfaces of the limbs as an efficient substitute for the more painful procedure of skin-grafting. Believing this to be a great improvement on the transplantation of skin entire, I determined to give it a trial in every case which presented a healthy granulating surface in a sound constitution. Accordingly, having in the wards the following four cases, I treated each one in the way suggested by Dr. Fiddes—i. e., by scraping scales from the limbs with an ordinary bistoury, and applying them to the granulating surface with a small brush.

CASE 1. — Sarah M——, aged twenty-six, admitted on Dec. 15th, 1870, suffering from a callous ulcer in the lower third of the leg, of twelve months' duration. It extended all round the leg except one inch behind, and was three inches broad. Poultices to be applied, and to remain in bed.

Jan. 2nd, 1871. — Granulations on a level with the surrounding skin, and looking red and healthy. I grafted three pieces of skin, and covered a portion of the surface two inches square with epidermic scales; strapped with soap plaster.

5th. — On taking off the plaster the skin-grafts were found adhering, but no evidence of the presence of epidermic scales. Restrapped.

It would be alike tedious and useless to describe the daily appearance of the ulcer. Suffice it to say that ten days after the application of the skin and epidermic scales the latter gave no manifestation of their presence, whereas the former was growing, and at the present time (Feb. 17th) the ulcer is almost healed.

CASE 2.—Jane F——, aged thirty-two, admitted Jan. 17th, 1871, with a circular-shaped ulcer of two years' duration, situate in the most common position—namely, on the outer aspect of the lower third of the leg.

Jan. 26th.—The surface looking exceedingly well, I covered it with scales scraped from the skin of her leg. Ulcer strapped, and bandage applied.

30th.—No visible change in the ulcerated surface, save that it is healing from the circumference. Restrapped.

Feb. 6th.—The scales having failed to adhere, six skin-grafts were applied, with the view of expediting the cure.

CASE 3.—Jas. C——, aged thirty-four, admitted Jan. 19th, 1871, having a raw surface extending along the back of his arm from the elbow to the axilla, and four inches wide; the result of erysipelas.

Jan. 26th.—The surface is entirely covered with epidermic scales. Strapped.

30th.—There is no apparent change. Restrapped.

The only noticeable feature in this case at the subsequent dressings was the smooth and glassy surface of the sore; this I ascribed to the soap-plaster. As the skin showed little tendency to contract, I applied seven pieces of skin, five of which adhered, and are doing well.

CASE 4.—John M——, aged twenty-eight, admitted Jan. 24th, 1871, with the right arm almost entirely denuded of skin from the axilla to the wrist, the result of a scald.

Jan. 26th.—Surface completely covered with scales scraped from his arms and legs. Strapped.

Briefly, I may state that in this as in the other three cases there was never any reparation whatever which was not of and from the circumference of the sore.

The lesson to be learnt from these four failures is this: that epidermic scales will prove useless in cases in which skin-grafting succeeds, as in Case 1. Also, that in no case can you with certainty predict success; whereas in almost every case you can rely upon the skin-graft adhering and growing.

No patient has ever objected to have his skin cut, and many have asked to have more "bits" applied, looking upon the rapidity of cure as ample guerdon for their injured feelings.

Manchester, Feb. 17th, 1871.

A Mirror
OF THE PRACTICE OF
MEDICINE AND SURGERY
IN THE
HOSPITALS OF LONDON.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

ST. BARTHOLOMEW'S HOSPITAL.

(THE OUT-PATIENT DEPARTMENT FOR WOMEN'S DISEASES.)

ON the 15th inst. we paid a visit to the department devoted to the special treatment of diseases of women. The attendance of patients was very numerous, and Dr. Greenhalgh and Mr. Godson availed themselves of the abundant materials thus afforded to give clinical instruction, and to demonstrate the use of mechanical appliances in this class of ailments. Among the diseases we noticed were pelvic hæmatocele, pelvic cellulitis, ovarian tumour, vascular tumour at the orifice of the urethra, fibroid tumours of the uterus, polypi, carcinoma, hypertrophy of the cervix, vesicocele and rectocele, and the various displacements of the uterus. These latter perhaps formed the larger proportion of the cases. Where displacement was unattended with inflammation treatment by mechanical support was adopted. A pessary which appeared to be in great favour for treatment of cases of retroversion, flexion, prolapsus, and procidentia, was Dr. Greenhalgh's modification of Hodge's well-known apparatus. Three of its sides consist of metal wire covered with soft india-rubber; but the narrow side, which is intended to rest against the anterior wall of the vagina, consists of soft india-rubber only. Another modification of this pessary, designed for cases of vesicocele, was provided with bars of soft india-rubber passing transversely between the long sides of the quadrilateral. Both these instruments appeared to possess advantages over the old form of pessary, and, according to the accounts of the patients, answer exceedingly well. There were several cases of fibroid disease, of which the prominent symptom was profuse hæmorrhage; these were all treated with ergot of rye, on which drug, combined with some other remedies, reliance was almost entirely placed to arrest uterine blood-discharges. For a case of mechanical dysmenorrhœa, in which the constriction was at the internal os and caused considerable obstruction to the introduction of the sound, a laminaria tent was introduced, in order that, by dilatation of the passage, the