the danger of suffocation, in consequence of its sticking in the glottis, is prevented. But if the foreign body be a bone or any rough substance that is stuck in the trachea, and not moveable, then you may introduce the forceps and remove it; and I can conceive of cases in which it is right to take a foreign body from the bronchus. I advise you, however, never to attempt the latter if you can effect the object in any other way. The introduction of forceps into the bronchus will occasion violent coughing, great irritation, and it is a frightful thing to introduce these instruments into the bronchus when the patient is agitated by a convulsive cough. Only conceive of the important organs in the neighbourhood. The lungs are below, and you may injure them, or you may take hold of one of the subdivisions of the bronchi instead of the foreign body. There is the pulmonic plexus of nerves behind; you are close to the phrenic nerves; you are not far from the great vessels of the heart; and the heart itself is close by. Think of the mischief you may do by poking among these important organs with forceps when the patient is agitated by a convulsive cough. Still, if there be a piece of bone stuck across the bronchus, it may be the only way of taking it out. But it does not often happen that any ragged body will go into the bronchus; if, however, it do, you may have to introduce the forceps five or six inches from the part where you make the wound externally.

But suppose a case in which there is a loose and ponderous body in the bronchus. In the case of Mr. Brunel, which occurred last year, there was a half-sovereign in the right bronchus. This gentleman, in playing with a child, flung a half-sovereign into his mouth, and it slipped down the windpipe. In the first instance it produced sickness, and as he drew his breath, previously to vomiting, it descended into the bronchus and occasioned coughing every now and then. When his head was placed down it could be felt rolling along the trachea. We attempted to remove it by placing him on a moveable platform, so that his feet were up and his head down nearly at right angles. The half-sovereign descended and stuck in the glottis so as nearly to choke him. We, therefore, determined not to repeat this experiment till we had got an opening in the trachea which would act as a safety-valve. We made an opening some few days afterwards below the thyroid gland, but the half-sovereign was not coughed up as a cherry-stone would have been, because it was too heavy. We made some attempts to use the forceps, but found it so dangerous that we desisted. When he had recovered from the effects of this operation,—in the mean time passing a probe every now and then,—we again placed him on a moveable platform, his back was struck with the hand, and the half-

sovereign escaped from the bronchus. He could feel it rolling along the trachea till it came to the glottis, and now, instead of sticking there, it passed through, just as you could roll it through the dead body, and came out of the mouth. There was no spasm of the glottis, and the absence of it was to be attributed to the opening in the trachea; for blood came out with the half-sovereign which had evidently passed in from the external wound, and where blood went in you may be sure that the air went in also. I apprehend the rule to be this:—In all cases where a foreign body has got into the trachea you must not trust to nature, but make an opening into the trachea; and then it is very likely that if the body be light it will be forced through the opening; or if, by its own weight, it can be made to assume a certain position, it will pass out through the glottis; or, if it be a rough, irregular substance, and sticks in the trachea, you may then, through the artificial opening, seize it with the forceps and extract it. But I advise you to be very careful how you use the forceps, except where the foreign body is actually in the trachea; cases may occur in which you must use them in the bronchus, but it must be done with the greatest possible caution.

ON THE EFFECTS OF
CHLORIDE OF ZINC,
AND
CHLORIDE OF LEAD,
IN THE TREATMENT OF
CANCER.

By E. W. TUSON, F.R.S., Surgeon to the
Middlesex Hospital.

DURING the progress of my investigation of cancerous diseases my attention has been directed in many cases to the effects of certain preparations of chlorine, either in arresting the progress of this malignant disorder, or having a powerful influence over it: and this has induced me to employ various combinations of chlorine in their treatment. The results (from time to time) will be brought before the public, and although the use of a paste made with chloride of zinc and flour, as an external application in an ulcerated state of cancer, is well known, I am induced to believe the profession are not so well acquainted with the administration of this remedy internally, and also with the effect of chloride of lead, and that the following cases may prove interesting to some of the readers of THE LANCET.

CASE 1.

Anne Scammel, ætat. 39, a cook, was admitted into the Middlesex Hospital, under my care Nov. 12, 1839, with an extensive can-

cerous disease of the right breast and neck, occupying the space between the lower border of the inferior maxillary bone and the under part of the pectoralis major, and from the sternum internally to the whole of the superior extremity on the outer side, so that the disease involved nearly one-sixth part of the body. She stated that the glands in the armpit first became enlarged, and she fancied the swelling arose from cold, about three years previously; that it had gradually increased since, affecting at first the breast, producing great tumefaction, and afterwards the whole arm, which became so much swollen that she could scarcely use it or bring it to her side. An irregular ulcer extended from below the nipple towards the axilla, its surface being superficial, and its edges hard. The whole of the parts enlarged were very firm; pressure with the finger on the arm or back of the hand produced little or no indentation. The glands below the jaw and above the clavicle were greatly enlarged, and the general hardness in the neck was so considerable that the clavicle could only be distinguished by a very diligent examination. The treatment consisted of dressing the ulcerated surface with the white precipitate ointment, and she was ordered to take a pill three times a day, composed of five grains of extract of hemlock and one of opium, and a night-draught of tincture of opium in camphor mixture. This plan was continued with little variation for about two months, without any beneficial effects either to the ulcer or the disease, which increased, and appeared of a very malignant character. The swelling of the arm continued, notwithstanding the use of flannel rollers. In January, 1840, a paste was directed to be applied to the ulcerated surface, made of one part of chloride of zinc, and three of flour; this was well mixed and moistened with water, and then applied over the whole of the ulcerated parts. The first application was ineffectual, so that it was used again, when also it was resolved to give the chloride of zinc internally. Half a grain was ordered every morning in a wineglassful of carraway water to be taken after breakfast. A lotion was directed to be applied to all the hardened parts, made of one drachm of chloride of zinc to a pint of water. The application of the paste a second time produced great pain for four or five hours, when a slough was formed, which separated with the assistance of a poultice, and afterwards the ulcerated surface healed kindly. The swelling in the arm gradually subsided, the breast diminished considerably, and that side of the neck assumed a more natural appearance. In a month from this time the case had completely changed its character. The arm was now of its natural size; the breast was soft, as also the neck, and every part of the superior extremity. In several places there were small tubercles, some of the size of a pea,

others a little larger; some were irregular, others smooth and circumscribed: there were six or eight at different places over the mammary gland, one or two in the neck, and one in the arm between the deltoid muscle and pectoralis major; they appeared to be enlarged lymphatic glands. The disease had now changed its character, and assumed the cancerous tuberculated form. The wound had completely healed. The medicine was continued for upwards of two months, the dose being increased to three-quarters of a grain. She complained of the draught being very unpleasant, tasting like metal, and leaving a roughness in the mouth for some time afterwards; one morning she took it before her breakfast, when it made her very ill and uncomfortable, causing severe spasmodic pains in the stomach; she was desired never to take the draught on an empty stomach, but to continue it regularly after breakfast. At the early part of April further improvement had taken place in this patient; the disease had been allayed to a considerable extent; she suffered no pain, felt in good health, and all tokens of disease had disappeared with the exception of the little spots. The arm, the breast, and that side of the neck, were in the same natural state as on the opposite side; she slept well, enjoyed her diet, walked daily out in the garden, and when any inquiry was made as to the state of her health she expressed herself confident that in another month she would be able to leave the hospital quite cured. Few people who had seen her at her admission would have believed she was the same patient, such a change having been effected by the medicine. This favourable change lasted only a short time; at the end of April the mouth and gums became sore, so much so, as to cause the medicine to be discontinued. Soon afterwards the arm began to swell again, and the breast became tender and painful. An ulcer appeared at another part of the mammary gland, which was healed by the application of the paste, when other ulcers were formed, which also healed by the same means, until at last the paste lost its influence, and the disease made rapid progress in spite of all remedies. Morphine and opium gave her a few hours sleep, but the cancer progressed, and she died on the 7th of Jan., 1841.

Post-mortem Examination.

A section being made of the mammary gland, it was hard and pear-like. The integuments were involved in the cancerous disease, which also extended to the axillary glands. The cervical glands intersecting the muscles beneath were considerably diseased. The ribs were very brittle, and a finger pressed upon the anterior part of any one readily fractured it.

Thorax.—On the surface of the pleura pulmonalis there were numerous tubercles of a cancerous character, as also on the

pleura costalis. The viscera were healthy, with the exception of the heart, which was soft and flabby.

Abdomen.—All the viscera were tolerably healthy, with the exception of the liver. Upon its surface there were many tubercles, some larger at its posterior border. On cutting into this organ there were several, evidently of a cancerous nature, situated deeply in its glandular structure.

Remarks.—The swelling and hardness, occupying so great an extent, might have been produced by an effusion of albumen or some deposit peculiar to this disease in the cellular tissue, which, being taken up by the lymphatics (excited by the influence of the chloride of zinc) left only the various tubercles, which also diminished in size by absorption. The cells must have been considerably extended, and filled to their utmost, so as to prevent any pitting. Had the cancerous disease existed to such an extent, the change that took place could not, it is presumed, have been accomplished.

This case illustrates the peculiar effect of the chloride of zinc in this cancerous disease, its influence upon the system, affecting the mouth and gums; and further observation may show some other effect of this preparation. It cannot be doubted that its external use is beneficial in healing open cancer, which I have succeeded in doing four or five times successively in several cases; and this should induce us to watch its effects, administered internally, in diseases of this character. A solution of one drachm to a pint of water injected upon a cancerous ulcer, or applied with linen rags, will be found a very useful application. Other preparations of chlorine have an influence over cancerous affections—chloride of lime; chloride of lead; terchloride of carbon; perchloride of copper, &c.; and a case has been described to me of a lady completely healing a large open cancer by the application of common salt (chloride of sodium). From my observations on the effects produced by the exhibition of various combinations of chloride, I am persuaded they have a very powerful influence over cancerous diseases; and I fully intend to investigate this subject, to combine two or more of these preparations, as well as to employ other new chlorides (which I have ready) internally; for it must be confessed by all conversant with the nature of these diseases, and with the pathological appearances seen in most cases, that they can only be counteracted by affecting the system, and thus acting on the constitution generally, and not by local application alone. Should, hereafter, a cure be found out for these inveterate diseases, it must be by internal agents, counteracting some peculiarity in the system, permitting certain parts to be affected by this disease, or some morbid defect in the nervous system, so that the natural and healthy structure of the component parts of

the animal texture are no longer preserved, but sink into this peculiar state of disease. The nature of cancer and its structure generally has been fully studied during a long period, and at present little useful knowledge as regards the treatment of the disease has resulted from the investigation, either by entering into its first formation, growth, or chemical composition. In forty cases I have noticed a trifling point (which may be fallacious, however); inquiry was made in respect to the diet of the patients, and whether they were in the habit of eating salt meat, or taking much salt at their meals, and the reply was (with the exception of one lady) that they disliked salt meat, and took very little salt. This led me to investigate the nature of the blood in several cases, to ascertain whether there were any chemical deficiency in the saline agents of this fluid, and on one occasion I thought some useful conclusion might be adduced; but upon a further and more elaborate investigation my hopes were blighted in a great measure on this point. The following case is interesting, inasmuch as it will exemplify the beneficial effect of another preparation of chlorine in cancerous affections:—

CASE II.

Mary Bradley, ætat. 42, was admitted into the Middlesex Hospital under my care Feb. 14, 1843, with a large, irregular, open cancer of the right breast, extending deeply into the axilla, so that the pulsation of the vessels could be seen, with a foul, yellow, excavated surface, copious discharge, with much fetor and severe pain. She stated that two years and nine months previously Sir A. Cooper had removed a scirrhus tumour: after the operation the wound nearly healed, but broke out again into an ulcerated state a fortnight afterwards; only the scirrhus swelling was removed. The rest of the breast with the nipple was left.

Feb. 15.—(*Extract from note-book.*)—The ulcerated surface extends deeply in the axilla down to the vessels, and over a large surface, from the centre of the sternum, to and below the axilla; it presents a very unhealthy appearance, with dark, excavated spots at various parts, the fetor very great, and the discharge considerable. The following lotion was ordered to be applied with linen rags constantly kept wet:—

R Chloride of lead, one drachm;
Water, a pint.

17. The surface of the cancer has a more healthy granulated appearance, more so in some parts than in others; the pain, she states, is less at the lower part, but much the same at the upper.

21. The surface appears more healthy; the granulations are red, and the edges of the ulcer have the appearance of healing; the

pain is less. The following draught to be taken three times a day :—

R *Chloride of potassium*, ten grains, in carraway-water.

24. The whole surface has much improved; complains of very queer sensations in the head, with loss of memory, and a dullness all over the head and eyes. Omit the draught.

March 13. The whole surface of the ulcer has become much better, and the edges are cicatrising slowly; she suffers less pain, and the fetor has ceased.

17. The edges of the ulcerated surface have a very healthy appearance, and at some parts have healed to the extent of an inch; but those parts that have healed appear to be only covered by a thin transparent membrane, unlike the healing of any other wound. In parts about the centre there are unhealthy excavated spots, which have much the appearance of the wound at her admission; she says she is pretty free from pain, and sleeps well at night.

21. The wound is still healing; the part healed is smooth and shining; it has the appearance of the ulcerated part being covered with a portion of goldbeater's skin; this is probably cuticle. The irregular excavated spots are still more unhealthy than when last examined. The axilla has considerably filled up since her admission, and the edges are healing in the same way as the other parts of the wound. She suffers little pain, but has been complaining of griping pain in the stomach and bowels. She was ordered an aromatic draught; she also complains of cough, for which she has been taking the compound squill pill. The discharge is less, and free from fetor. When the dressing is removed there is a blackness and discoloration upon the skin, caused by the action of the lead, of the same appearance as seen upon the edges of a stump after amputation. She was ordered to continue the lotion, but to be watched on account of the pain in the bowels.

24. The ulcerated surface remains about the same; the spots have increased in size, and appear to approach the edges of the wound; the part that has healed appears healthy. She has been pretty free from pain, and the sensations felt in the stomach and bowels have ceased; towards the axilla a great improvement has taken place; it has healed considerably, and has filled up nearly to the surface of the skin.

28. The ulcer in the centre has much the same appearance; the edges are not so well; small ulcerated spots, of the size of a pin's-head, have been formed; they seem to extend deep, and the thin membrane at parts has become absorbed. She was ordered to take *liq. chlorini*, 5i; *water*, ʒiiss, three times a day.

31. The ulceration is about the same, with the exception of the edges; the small ulcers

have increased, and some have acquired the size of a small pea; they are deep, and contain a thick, white discharge. The lotion of chloride of lead to be discontinued, and the following one used :—

R *Chloride of zinc*, ʒj;

Water, ʒxx. Make a lotion.

She said the medicine did not agree with her. It was ordered to be discontinued.

April 4. She has been using the lotion continually since our last visit; the ulcerated surface has the same appearance. The application caused no pain nor inconvenience.

7. Remains much the same; perhaps at parts the ulcerated surface has a more healthy appearance. The lotion to be increased to double the former strength.

11. The ulcerated parts have a more healthy appearance at some places, and the edges are better; the spots have diminished in size and depth. The lotion still causes no pain; she says she remains much about the same.

15. The cancerous surface presents a cleaner appearance, with less discharge; she complains that the lotion gives her pain now when it is applied, and that this lasts for some time. She was ordered to discontinue it, and to use the former lotion.

21. The whole surface of the ulcerated part remains much about the same; the spots are increasing, appearing dark and unhealthy; the edges of the wound are becoming more irregular.

28. The whole appearance of the ulcer remains unchanged.

May 5. The ulcerated surface appears a degree better; she suffers little pain, and sleeps well at night; she complains of being very low, and was ordered some port wine.

12. The dark spots have sloughed at some places, and the wound has been bleeding. The muriated tincture of iron has been applied.

19. The wound appears cleaner; no bleeding since our last report; she remains about the same.

26. The wound is more unhealthy; the spots at the edges have again made their appearance; they are deep, and discharge a thick pus.

June 2. The ulcerated surface has been bleeding several times; the former application was employed on each occasion with success; she is very low, and complains of her chest and cough. Comp. squill draught three times a day.

9. The whole surface has a more unhealthy appearance, and altogether the patient is worse in every respect; she is very low and restless; bleeding not so frequent; She was ordered wine and a little brandy with an egg; to go on with the draught.

16. The ulcerated surface appears more unhealthy; it has sloughed at small places, and bled a little several times; the wound has

extended deeply into the axilla. From this time the patient gradually got worse, had great difficulty in breathing, no doubt from effusion of serum in the cavity of the thorax; the ulcerated surface bled several times, the muriated tincture of iron always stopped it; and she died on the 30th of June, having been in the hospital four months and a fortnight. No post-mortem examination was allowed to be made.

Remarks.—In this case the effects produced by the chloride of lead and the effort of nature to assist in the removal of the disease by the ulcer filling up and healing at the edges, were most striking. The disease having again an ascendancy over the system, destroying the edges at several parts, the patient being relieved from pain by the application, and life prolonged, were remarkable. Little doubt can be entertained that had not the application been used bleeding would have taken place sooner from the ulcerated surface near the axilla, which would have been fatal at the time; or she would have died from exhaustion, as the vessels at her admission were distinctly seen in the armpits. The chloride of lead has been very extensively used in many cases of disease of the breast and uterus in the form both of lotion and ointment, with much success; it appears to act upon the nerves, paralysing them, and thus producing ease. One young patient used an ointment made with one drachm of the chloride of lead to an ounce of common cerate, rubbing it over the breast and armpit; it produced a complete numbness of the arm, and relieved the pain: the ointment was discontinued, and the numbness subsided in the arm: it was still used over the breast, and the patient was cured. This ointment will be found of most use in hysterical affections of the breast, or nervous irritability of its gland, and also in other cases, particularly when any tumour presses on or involves a nervous filament, and thus produces constant pain; the ointment applied upon the course of the nerve, over the situation of the pain, will give ease; it is also of much use in allaying inflammation, and it forms another valuable remedy in the treatment of these diseases.

Russell place, Fitzroy-square,
Jan. 1, 1844.

TREATMENT OF CHANCER.—M. Ricord's favourite application is lint impregnated with aromatic wine. This is a decoction of sage, rosemary, thyme, hyssop, mint, &c. in eight times their weight of Burgundy wine. It destroys the contagious quality of the secretion from a chancre and *tans* the neighbouring parts, rendering them less susceptible. M. Ricord has now and then found benefit from the addition of from one to six per cent. of tannin to the foregoing, to promote the latter purpose.—*Prov. Jour.*

AN ANALYTICAL INQUIRY

INTO THE NATURE OF THE PROCESSES OF DIGESTION AND NUTRITION.

WITH PRACTICAL DEDUCTIONS.

By GEORGE ROSS, Esq., Kennington.*

General Remarks.

It has been the custom among physiologists to attribute the formation of certain products to certain organs, simply because they have been found in connection. For example, urea was once supposed to have been formed in the kidneys, and choleic acid is still supposed to be a product of the liver; in the former case, indeed, the opinion has been abandoned, but in the latter the dogma, although resting upon a foundation equally rotten, continues to be supported. If it should prove correct, it will not receive its justification from past evidence or modes of reasoning.

Again, erroneous views of the functions of organs have obtained from the same cause. Thus, the mouth has been styled the organ of mastication; the stomach the organ of chymification; the duodenum the organ of chylication; yet, when these distinctions acquired importance, no physiologist was able to inform us upon what ground he established them; or, if correct, in these local ascriptions, he would have been perplexed to tell us the mode in which these organs performed their functions. Now, we are not justified, in strict reasoning, to say that any structure is the organ of a certain function unless we can prove it to be so, either by positive fact or negative evidence. If I, at the outset of these papers, were to pronounce the mouth to be a *stomach*, I should probably be declared mad, yet I should be quite as rational as those who call the stomach a *stomach*—by which is meant the organ of chymification. Further, the duodenum has been termed the organ of chylication, and yet acute physiologists have doubted whether the chyle may not be really included in the chyme of the stomach. Each of these organs may be the receptacle in which certain changes take place, but neither of them is, to the full extent, the cause of these changes, as is implied by the ordinary nomenclature. An organ must, necessarily, be the cause of the changes ascribed to it, but as yet we do not know that the duodenum forms chyle any more than that the bladder secretes urine, or is instrumental in the changes that take place in the urine while deposited within its cavity. These expressions, it may be said,

* Author of "The Diagnosis (Chemical), Pathology, and Treatment of Typhus Fever," *LANCET*, vol. i., 1842-3, pages 782, 809, 853, 885.—Ed. L.