seems to me probable that the dilatation may have been due in these various cases to loss of arterial tone.

One of the most carefully recorded cases of cervical rib that I have come across is that of M. Planet. The patient here complained of nerve troubles only, pain, numbness, etc., and in particular of chilliness of the hand, on the side of the prominent cervical rib, on exposure to cold. There was nothing amiss with the circulation in the arm. This seems to me an important fact, and suggests a disturbance of the vasomotor mechanism. The man complained of some alteration of voice, and this was supposed to be due to some interference with the recurrent laryngeal nerve.

In Walsham's case there is another fact of singular interest. Whilst the patient—a man—was under observation, an enlargement of the lobe of the thyroid was observed on the same side as the dilated subclavian and obliterated arteries. In Dr. Beatty's case of Raynaud's disease there is also a thyroid enlargement (cystic in nature), and this association of goitre and Raynaud's disease has been on several occasions noted by previous observers. Now I have no intention of entering into a discussion of the pathology of thyroid enlargements, but I can see nothing improbable in the supposition that such enlargements might occasionally result from some vasomotor fault. The results of the most recent operative treatment of exophthalmic goitre are of interest in this connection. Jaboulay and others have excised a portion of the cervical sympathetic in such cases with beneficial effect, it is stated, not only on the exophthalmos, but also on the goitre itself.

What I have endeavoured to show by all this is that there is some evidence in these cases pointing to a lesion of the sympathetic. It remains that I should suggest a possible explanation for the fact that these nerves should have suffered from the presence of the cervical rib. With this in view I made a careful dissection to demonstrate the normal relations and connections of the cervical sympathetic and the trunks of the brachial nerves. For the opportunity of making this dissection I am indebted to the kindness of Professor Cunningham. To avoid being wearisome I will consider together the normal anatomy and the alterations caused by the presence of the abnormal rib.

Normally, the eighth cervical and first dorsal nerves unite above the first rib, the last-named nerve rising to meet the other in intimate relationship with the neck of the rib. The neck of a cervical rib is crossed by the conjoined roots of the same nerves, and the seventh cervical nerve is a superior relation to the rib. I believe it is here—that is, at the neck of the cervical rib—that pressure symptoms are most likely to be produced. Since the cervical and first thoracic rib converge anteriorly, it is obvious that the displacement of normal relations will be greater the nearer the approach to the vertebral end. (It follows that the artery, which is only related to the cervical rib at its anterior end, will suffer relatively less displacement than the nerves.) The inferior cervical ganglion of the sympathetic lies normally in a recess occupied by loose fat between the head of the first rib and the transverse process of the seventh vertebra. In the presence of a cervical rib it will very probably be dislodged from this recess, and lie in the much less protected position in front of the head of the abnormal rib. The branches of the ganglion to the nerve trunks are most abundant as they concern the lower brachial nerves; that is, the nerves most endangered by the cervical rib. The branch to the seventh nerve normally passes through the foramen in the transverse process of the seventh vertebra. This connection must be completely altered in the presence of a cervical rib, but I have no knowledge of what its course actually is under such circumstances.

It is unfortunate that we do not possess more exact knowledge of the altered relations of the sympathetic; considerations, however, such as I have referred to are sufficient to show that the anatomy of the inferior cervical ganglion and its branches must undergo a very material derangement from the normal. Further, we may conclude that there is nothing unreasonable in supposing that the extra rib might produce its harmful effects rather at its vertebral than at its distal extremity; and, if this is so, it becomes easier to explain the singling out of vasomotor fibres than if the rib only acted at its anterior end.

For clearness sake I would briefly epitomise what has gone before as follows:

1. The cervical rib was in some way the cause of the arterial obliteration.
2. The circulation through the subclavian was not obstructed.
3. The occurrence of embolism may be excluded.
4. The manner of the obliteration suggests thrombosis, which in turn implies a preceding disease of the endothelium.
5. The cause of this arterial disease was very probably in part, but only in part, the carrying of heavy weights.
6. If the rib acted directly on the artery, it must have done so in some way upon which present pathology throws no light.
7. The rib may have acted indirectly on the artery through the nerves.
8. The nerves are more likely to have suffered than the artery and nervous symptoms are much more common than circulatory.
9. A nerve lesion is capable of causing gangrene.
10. A nerve lesion may cause structural changes in the blood vessels.
11. The absence of clear signs of a peripheral neuritis is a striking argument against the theory of nerve origin.
12. My case resembles the local phenomena of Raynaud's disease, which is almost certainly a neurosis, and here there is commonly an absence of usual symptoms of neuritis.
13. But in Raynaud's disease the arteries are stated to be usually healthy. In Dr. Beatty's case, however, and in some others, this is certainly not so.
14. From the occurrence of such changes in Raynaud's disease we may conclude that not only from nerve lesions generally, but from disease of vasomotor nerves in particular, structural changes in arteries may arise.
15. In cases of cervical rib there occasionally occur symptoms which may possibly be explained by injury to the cervical sympathetic. Such are (1) increased heart action; (2) excessive subclavian pulsation, and sometimes fusiform dilatation of the artery; (3) abnormal sensitiveness of the arm affected to external cold; (4) thyroid enlargement.
16. A study of the anatomy of the region concerned suggests that the abnormal rib may have excited its evil effects not at its distal but at its proximal extremity; here the rib is an intimate relation not only of the seventh and eighth cervical and first dorsal nerves, but also of the inferior cervical sympathetic ganglion and its branches. The number of these sympathetic connections is much greater with the lower than the upper brachial nerve trunks.

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THE EFFECT OF THE ROENTGEN RAYS IN A CASE OF CHRONIC CARCINOMA OF THE BREAST.

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The following case seems worthy of putting on record seeing the remarkable improvement which has taken place since the regular employment of the Roentgen rays, now some nine weeks. A.B., a woman aged 60, was admitted into the cancer Department of the Middlesex Hospital under my care on September 19th, 1898, and the following is the note of her condition taken the next day:

The right breast consists almost entirely of a red ulcerating surface with a hard margin, the whole is fixed firmly to the pectoral muscle and bony structures beneath, and under the skin at the edge of the ulceration, towards the axilla a hard fixed mass can be felt. In the axilla several indurated glands can be distinguished, they are about the size of a large hazel nut and immobile. No other enlarged glands can be felt and the other breast appears normal. With the exception of several punched-out deep ulcers on both legs the patient apparently is in good health.

Briefly her history was as follows: Her mother's sister had died of cancer of the breast, and her father of consumption. She had had rheumatic fever when 30 years of age and had been subject to ulcerations over her body similar to those on her legs now, otherwise her health had been good. She had had seven children but only two were born alive; she had also had three miscarriages. There was no history of primary or secondary syphilis though I should say the ulcerations were undoubtedly syphilitic. As regards her breast she stated that in 1890 she had a blow there and soon after suffered a great deal from acute pains shooting through it, and on examination she discovered a lump about the size of a bean. She, however, did nothing until 1894, when, as the lump had increased, she applied at the Middlesex Hospital, and was admitted under the late Mr. J. W. Hulke, who then advised operation. This the patient declined, and she was discharged.

Fig. 1.—Photograph taken on March 5th, 1901, showing the condition of the breast before treatment with the Roentgen rays was begun.

In 1898 the tumour had attained the size of a tangerine orange and had become adherent to the skin, which soon after ulcerated. The tumour enlarged, and the ulcer spread slowly until it attained the size above described. As the attacks of pain had become more frequent and more severe, she sought readmission to the hospital. The induration and the ulceration gradually extended, and presented the appearance shown in Fig. 1 on March 6th, 1901, when Mr. H. Clifford, the house-surgeon, asked me if he might try the effect of the Roentgen rays. It may be mentioned that early in 1899 the patient developed glycosuria, and in the latter part of the same year gangrene appeared on the great toe of the right foot, which extended, and resulted in the loss of two of her

toes. The foot, however, healed soundly, and since the early part of December last it has given her no trouble.

On March 6th the application of the x rays was begun, and the treatment has been continued five days a week up to the present, the surface being exposed to the rays for fifteen minutes at a time.

On March 17th there is a note, "Breast a little cleaner; numerous islands of epithelium present." April 14th: "Appearance of breast still improving; patient states that she suffers much less pain than before the treatment began." April 23rd: "Still further improvement in the ulceration and a diminution in the size of the indurated lump."

On May 14th the breast presented the appearance shown in Fig. 2. The induration has gradually been getting less, and the patient has but little pain. The glands in the axilla are smaller, and her general condition is improving. I may add

Fig. 2.—Photograph taken on May 7th, 1901, showing the altered condition of the breast after treatment with the Roentgen rays five days a week for two months.

that on her admission to the hospital potassium iodide was administered; as this did not agree with her sodium iodide was substituted with a like result. Opium and codein were given for her glycosuria, but with these exceptions no special drugs were employed.

THE annual meeting and dinner of the Association of Public Vaccinators will be held at the Hotel Great Central on Friday, June 28th. Public vaccinators, whether members of the Association or not, may obtain tickets from the Honorary Secretary, Mr. V. A. Jaynes, 157, Jamaica Road, S.E. (7s. 6d., exclusive of wine).