when it is about to enter the stenosis, the other the distance of the dental arches at the superior extremity of the third olive, when it has completely entered the stenosis. We then know exactly when the three olives have penetrated the stricture.

The progressive movement is due to the œsophageal peristalsis: it is gentle and continuous, and does not provoke spasm, consequently it fulfils the best conditions of therapeutic dilatation.

When the olives have passed the stricture they fall into the stomach, the patient distinctly feeling their fall. They take, on an average, from three to six days to pass through the stenosis.

Once in the stomach, they are drawn out through the gastrostomy opening, cleansed and replaced in the mouth, or changed for a larger kind.

When using this method, which obviously necessitates a very long treatment—several months or even years (three years in one of my observations)—I have never yet had a failure in a case of cicatricial stenosis of the œsophagus—most of them due to caustics—which I have treated during recent years.

TWO BENIGN GROWTHS REMOVED BY BRONCHOSCOPY.

By A. M. ZAMORA, London.

THE following is an account of two rare cases which have come under my care at the Royal Chest Hospital:—

CASE I.—Papilloma of the left bronchus.
CASE II.—Fibroma of the trachea.

CASE I—**Clinical Notes by Dr. Day.**—F. N., a young man aged 24, carpenter, came to the O.P. department of the Royal Chest Hospital in January 1928. He stated that for the last three years he had had a recurrent cough attended with hæmoptysis, usually lasting two days at a time. The last attack had been protracted to ten days over Christmas. In the intervals between the attacks his general health had been excellent and his weight maintained; there was nothing suggestive in the family or past history. On three occasions his sputum had been examined for tubercle bacilli with negative results. On examination his physique and general condition were good. There

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were no signs of cardiac disease. Examination of the lungs showed no impairment of movement nor of air entry, but coarse rhonchi over the upper part of the left chest. This rhonchus was intensified after coughing, and the patient stated that he felt a distinct irritation at times behind the inner end of his left clavicle. On deep expiration rhonchi of less intensity were also found scattered over both lungs. No tubercle bacilli were present in the sputum. A radiograph showed no evidence of pulmonary tuberculosis, bronchiectasis, or other disease.

At his next visit the patient complained of irritating cough and hoarseness. This hoarseness had troubled him occasionally during the past five months. He was therefore referred to the Throat Department under me, in the hope that a laryngeal examination might throw some light on the nature of his complaint. A papilloma was found on the vocal cord, and was removed at operation on 1st March. Diagnosis was confirmed on microscopic section. After operation the hoarseness disappeared, but some eight weeks later the patient reappeared and complained that he had been coughing up pieces of "gristle." The larynx was found to be normal.



FIG. 1.—Actual size.

Nothing more was seen of the patient until October, when he returned with his original complaint. He had had several recent febrile attacks with slight hæmoptysis, during which he had coughed up some solid material. A piece of this material was secured and on section proved to be a portion of a papilloma. Medical examination showed a persistent rhonchus on the left side of the chest with maximum intensity over the inner end of the first interspace and corresponding position behind. There were no adventitious sounds elsewhere. The patient stated that he was conscious of a peculiar local irritation and sense of obstruction, especially during coughing, felt at the root of the neck and inside the upper part of his chest on the left side.

On these signs and findings, the diagnosis of a papilloma of the left bronchus could be made. The patient was admitted under me for bronchoscopy.

Operations—8.11.28.—Multiple small papillomata seen and removed from the trachea. 15.11.28.—Main growth seen at opening of left bronchus. 19.11.29.—Main growth removed from bronchus.

Following these operations the patient remained free from trouble until September 1929, when he began to suffer from an irritating cough and soreness of the chest. These symptoms became intensified two months later with a return of local irritation under the left clavicle

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and slight hæmoptysis. Examination showed a return of the former physical signs as described above.

Admitted—2.12.29.—Recurrent growth, ½ inch in diameter, removed from the left bronchus.

Pathological Report.—Papilloma. Inflammation.

Complete relief followed this operation. In January 1931 the patient returned on account of recent cough with soreness of the chest. There was, however, no hæmoptysis and no local irritation of the chest as formerly. On examination the air entry on both sides was free and no rhonchi were heard.

Dr. Schuster's Report on Growths Removed.—The fragments removed from the trachea at different times all show the structure of benign papilloma composed of stratified epithelium, with columnar cells at the base becoming squamous towards the surface. The latter show inflammation in the central cores of the papillae, and some degeneration of the cells.

The last two specimens were removed from the left bronchus; they have the same structure but the cells are rather more columnar.

There was never any question of malignancy. See Figs. 3 and 4.

This case may be regarded as a demonstration of the ease with which pieces of papilloma may implant themselves on mucous surfaces. The first pieces removed are looked upon as implantation growths originating in a parent bronchial growth.

CASE II—**Clinical Notes by Dr. Stott.**—C. W., Accountant, aged 59.

History.—For six months increasing shortness of breath causing "gasping" with any exertion. Tightness of the chest, worse when bending over the chest at work. Winter cough since an attack of bronchitis in 1925; scanty sputum and an occasional clot of blood noticed in sputum during last two or three years. No pain in the chest; no dysphagia. Fair appetite; loss of weight—two years ago weighed 11 stone 5 pounds and there has been a gradual decrease to 10 stone 5 pounds. Previous health good, except for bronchitis.

On Examination.—General condition fair. A suspicion of cyanosis. Considerable inspiratory stridor. No physical signs of disease found except that there appeared to be a slight impairment of note and weaker breath sounds over the left upper part of the chest in front.

Pathological Report by Dr. Schuster—*Macroscopically.*—The tumour resembles a large whiteheart cherry. The surface is smooth with vessels running over it, and there are the remains of a pedicle. The consistency is firm and elastic; the cut surface is white with scattered yellow and brown patches.

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Microscopically.—The tumour is a cellular fibroma. It has very little adult tissue and consists chiefly of groups of fibroblast running irregularly through it. There is a covering of stratified epithelium, more flattened than is normal in the trachea. Blood vessels are very numerous and a prominent feature of the sections; they are thickened and sometimes obliterated. Coloured areas represent old and recent hæmorrhages; there is also inflammation and hyaline degeneration. Fat is present in a small quantity. There is no amyloid.

This case was referred to me by Dr. Stott because, though the chest showed no physical signs, there was very severe dyspnœa. Examination of the larynx showed no abnormality, but the bronchoscope revealed a smooth rounded growth moving very slightly with each respiration and apparently attached to the front of the trachea about an inch above the bifurcation. After applying adrenalin, the pedicle was defined and grasped with crocodile forceps and the growth delivered through the glottis with a little difficulty.

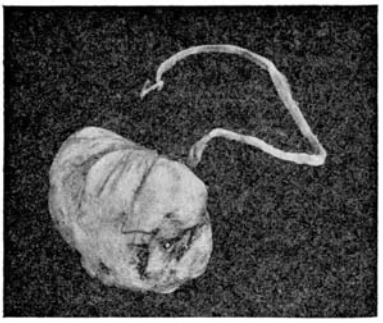


FIG. 2.—Actual size.

Records of benign tumours of the tracheo-bronchial tree are rare, but it is doubtful whether the existence of such tumours is so uncommon as is generally supposed, and it is probable that more frequent bronchoscopic examinations will reveal a much higher incidence.

A comprehensive collection by Ellen J. Patterson[1] as late as June 1930 comprises twenty-six cases in all. Of these, ten were diagnosed in the post-mortem room and sixteen were discovered by bronchoscopic methods. This list includes, in all probability, the great bulk of the recorded cases, though it is possibly not exhaustive. Some of the cases described fall into the class of inflammatory swellings, but since the mechanical effects are the same it is practical, from the point of view of treatment, to group them with the benign growths.

In view of the fact that new growths of the lung present no characteristic clinical picture by which they can be diagnosed, and considering their importance in the causation of suppurative disease, it is clear that bronchoscopic examinations and treat-

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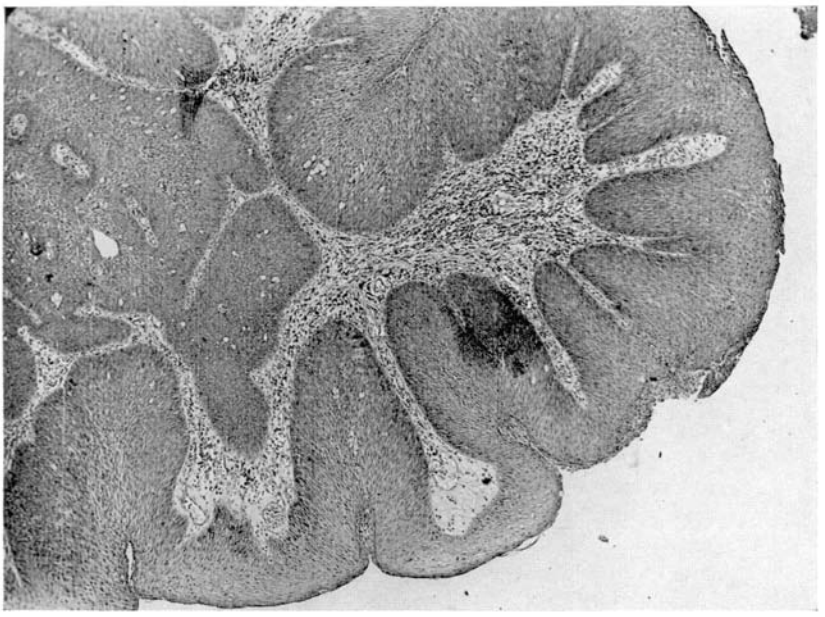


Fig. 3—Case I (low power).

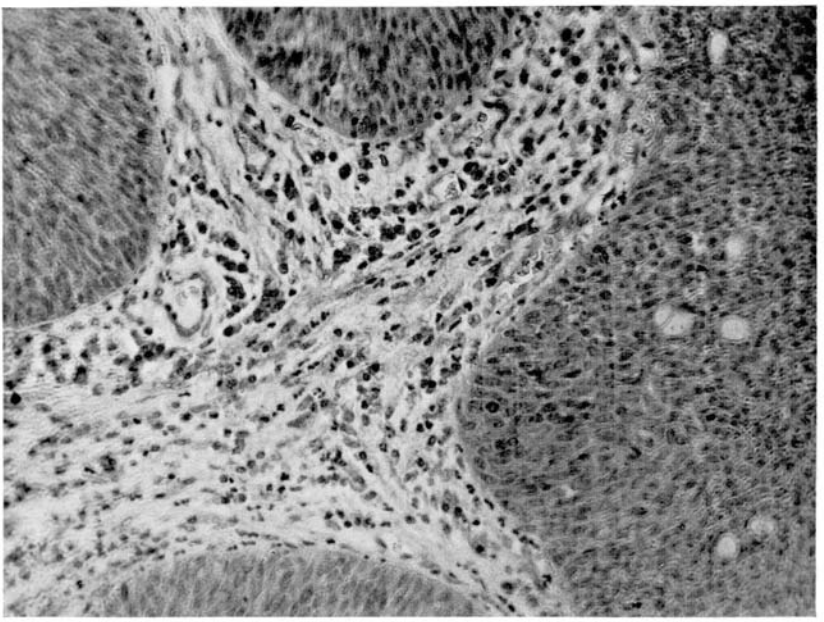


Fig. 4—Case I (high power).

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ments acquire great importance and should frequently be undertaken in these cases. X-ray films do not offer great help, since in the early cases there is no change and in the later stages suppurative processes predominate and mask the picture.

The extent to which growths may be removed from the bronchial tree by endoscopy is an interesting consideration. Certainly many benign tumours can be completely removed. Inflammatory masses can be reduced enough to promote drainage and influence secondary lung changes. Some tumours of lesser malignancy can, on occasions, be treated, as was Chevalier Jackson's case of endothelioma of the bronchus,[2] which reported perfectly well one and a half years after operation. Even in the malignant types the suggestive work of Nelson[3] opens up the possibility of a useful field of treatment, either curative or preparatory to later surgical removal, by the introduction of radon seeds into the growth and its lymphatic drainage.

Local anæsthesia is infinitely to be preferred to general in these cases, but the fact that the first case was brought to a successful conclusion with general anæsthesia proves that it is not entirely contraindicated, though since then all my bronchoscopies have been done under local cocaine anæsthesia reinforced in some cases with bromide, morphia and scopolamine, and in others by avertin. Avertin seems to be preferable, for it seems to have a less depressing effect on the respiratory mechanism and achieves a profound amnesia, an important point in patients who must undergo repeated examination or treatment.

REFERENCES.—[1] *Arch. Oto-Laryngol.*, December 1930. [2] *Amer. Journ. Med. Sci.*, March 1917, p. 371. [3] *Lancet*, 22nd November 1930, p. 1118.

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