of atropia sulphate was again injected into the jugular vein, and it is evident from the chart that the physostigma was completely antagonised thereby. A continuation of the experiment was, perhaps, scarcely necessary; still a grain and a half of Calabar extract, triturated with 1 cc. bile and 5 cc. water, was injected into the duodenum at *c'*, and two grains of the extract similarly treated were injected at *c''*. The exciting effect was not very marked; nor need this be wondered at, considering how powerfully the liver had been previously stimulated, and its partial exhaustion induced not merely to the above cause, but also to the duration of the experiment.

As the action of acetate of lead on the liver was to be investigated, eight grains of that substance, dissolved in 20 cc. of water, were injected into the duodenum at *l*, and the secretion of bile soon thereafter came to a standstill. Subsequent experiments show that this effect was unusual and attributable to the depressant effect of the lead on a liver already well-nigh exhausted.

NECROPSY.—Great irritation of the mucous membrane of the small intestine to the extent of about fifteen inches below the pylorus. The viscous contained only slight evidence of purgative action.

Result of Experiments with Physostigma.—The relation of the dose to the size of the animal, and the coefficients of the secretion before and after its administration, are stated in Table I.

TABLE I.

Physostigma.	Total Dose in grains.	Grains per Kilogramme of Body-Weight.	Secretion of Bile per Kilogramme of Body-Weight per Hour.	
			Before.	After.
Experiment 1	2 with bile	0.0074	0.098 cc.	0.365 cc.
„ 2	2 „	0.0147	0.138 cc.	0.753 cc.

It is interesting to observe that in Experiment 2 the dose, which, in relation to the size of the animal, was twice as great as in Experiment 1, raised the coefficient of secretion to a little more than twice the figure attained in Experiment 1, showing forcibly the precision of the experimental method employed. The high coefficient in Experiment 2 indicates a very powerful effect; yet, since the dose employed was four times the maximum dose for a man, and seeing that one grain produced only a trifling effect in Experiment 1, it may be inferred that, in the human subject, physostigma will probably be found to have, in the relatively small doses administered, an insignificant effect on the liver; for the experiments of the first and second series have demonstrated that, when the same dose of a substance that powerfully excites the human liver is given to an average-sized dog, it powerfully excites its liver. It is an error to suppose that the dog requires much larger doses of all drugs than are necessary for the human subject. The effect of physostigma on the liver is completely antagonised by atropia sulphate.

Prevost of Geneva, in 2 communication to the Paris Academy of Sciences (August 3rd, 1874), states that muscaria increases the biliary secretion, and that atropia checks the excessive secretion due to muscaria.

[To be continued.]

THE CAUSE OF DEFORMITY IN FRACTURE OF THE LOWER END OF THE RADIUS.—It is a well known and generally acknowledged fact, that a fracture of the radius can often only be diagnosed by the very characteristic deformity which takes place in the lower extremity of the bone. There are, however, cases in which this deformity cannot be proved, and in consequence the diagnosis must be very uncertain. M. Schmit (*Revue Mensuelle de Médecine et de Chirurgie* for November) has tried to diminish this difficulty by showing that the age of the patient, the height from which he fell, and the amount of the injury sustained, are more or less closely connected with the absence of this deformity. The author has made many experiments, the result of which he quotes as follows. The deformity can be demonstrated in about one-half of the cases as long as the epiphysis and the bone are not yet firmly joined together. Between the age of twenty and forty, deformity is quite the rule; the exceptions are very rare, perhaps only five per cent. With advancing age, however, this tendency to deformity grows less; after sixty, it is only met with as an exception, especially in women, where it appears in eleven out of thirty. In order to discover why this very characteristic deformity does not take place in fractures of the inferior extremity of the radius in old men, and especially in women after sixty, M. Schmit has repeated the experiments performed by Nélaton, Lecomte, and Tillaux, in addition to his own. He has come to the conclusion that in all these cases deformity is prevented by the want of resistance in the radius of the aged, which is caused by the increasing thinning of the substance of the bone.

DISEASES OF THE BRONCHIAL GLANDS.

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THE study of the diseases of those lymphatic glands which are situated at the bifurcation of the trachea is of great interest and importance, not only in reference to the diseased glands themselves, but also by reason of the manner in which they, on the one hand; simulate, and, on the other hand, modify and mask the diseases of other organs in the neighbourhood. Throughout English and foreign medical literature numerous cases will be found described, in which there existed marked disease of the bronchial glands. Little notice, however, has been taken of less striking, but far more numerous, examples of disease. And it is only within a comparatively recent time that the condition has received special attention and been discussed as a disease *per se*. MM. Riillet and Barthez, in their well-known *Traité des Maladies des Enfants*, have described the disease in infants; and Dr. West, in his work on *The Diseases of Infancy and Childhood*, has fully and clearly described—under the head of “Bronchial Phthisis”—the tubercular diseases of these glands in young subjects. It is, however, to M. Noël Guéneau de Mussy, following up and widely extending the investigations of his predecessors, that we are specially indebted for our knowledge of the effects of these lesions, and to his pupil, M. Baréty, who has published an exhaustive memoir upon them, under the title *L'Adénopathie Trachéo-Bronchique*. The subject has attracted my notice since, or even before, the year 1853, and I have kept short notes of nearly sixty cases which I have seen in private practice and which will form the basis of some of the conclusions to be here stated.

Before, however, describing the pathological and clinical history of the diseases of the bronchial glands, it will be well to make a short reference to their anatomical relations. Taking the bifurcation of the trachea as a starting point, we find in the space between the right and left bronchus a group of glands. They are from ten to fifteen in number, and they vary in size from that of a small pea to that of an almond. The glands towards the right bronchus are larger than those towards the left. Glands are also situated upon the tubes; they are few in number and small. The vascular supply of the glands, which is free, is derived from the bronchial arteries, and the blood is returned to the bronchial veins. Afferent lymphatics reach these glands from the lungs, from the pleura, from the neck, and other neighbouring parts. Besides these groups of comparatively large glands, numerous minute lymphatic glands are found in connection with the primary division of the bronchi, chiefly at the back of these tubes, at their bifurcations and those of the pulmonary artery. The central group of glands is in relation in front with the pericardium, the arch of the aorta, and the pulmonary artery; behind, with the pulmonary plexus of nerves, the oesophagus, the aorta, the vena azygos, etc. The glands on the upper, the anterior, and posterior surfaces of the right bronchus are four or five in number, and smaller than those of the central group. Their situation brings them into relation with the arch of the aorta, with the innominate and subclavian arteries, with the brachio-cephalic vein, and with the vena azygos, the pneumogastric nerve, and its recurrent branch. The glands on the left bronchus are still smaller than those of the right side. Their position gives them relations with the arch of the aorta, the origin of the left carotid and subclavian arteries, the left branch of the pulmonary arteries with the large veins, with the left pneumogastric nerve, and especially with its recurrent branch. Lastly, it should be stated, as a guide in clinical examination, that the bifurcation of the trachea takes place in front of the body of the fifth dorsal vertebra, or between the fourth and fifth, and behind the lower end of the first bone of the sternum. The glands, except when diseased, are proportionately larger in children than in adult or aged persons.

The bronchial glands participate in the *pathological conditions* which affect lymphatic glands generally. In the present instance, however, those cases will not be noticed in which the bronchial glands, becoming the seat of constitutional disease in association with other glands in the neighbourhood, constitute large and manifest tumours. Nor is it intended to give prominent consideration to the state of the glands when they enlarge in acute disease—such as eruptive fevers;

nor in those diseases—such as typhoid—where the glands play a secondary part. The writer has been anxious to describe and to aid in recognising the presence of a condition in which the disease of the bronchial glands constitutes to some extent a disease *per se*, or gives rise to complications which it is important to recognise. The remaining morbid changes to which the bronchial glands are liable may be grouped as follows.

a. The bronchial glands are liable to *congestion* with enlargement, as are glands in other situations. *Hypertrophy* may be the result, if the latter condition become chronic. After childhood, the glands in this situation become almost invariably studded with black deposits, the quantity of which may be so considerable as to constitute *melanoma*.

b. These glands are liable to *acute and chronic inflammation*. Acute inflammation in this situation, terminating in *abscess*, is rare, but several cases of the kind have been recorded. Chronic inflammation of the glands is by no means uncommon. It may lead to permanent enlargement, or to contraction and induration of the glandular textures, with the presence of calcareous particles, or to abscess. The contents of the abscess may be more or less completely absorbed, leaving a partially filled *sac* or *cyst*, containing thick pus or cheesy matter. But these glands, when inflamed and enlarged, may form adhesions with surrounding parts, and the contents of an abscess, if it exist, may be discharged by an *ulcerative* process into the substance of a lung, into the mediastinum, into the trachea, or oesophagus, or even into a blood-vessel. *Diffused emphysema* has been found in such cases, and the emptied sac has assumed in some instances the character of a cavity connected with the lungs. When the matter is discharged into the air-passages, *purulent expectoration* is the result. Two or three examples of such cases were noticed in the writer's observation, and the possibility of their being mistaken for the discharge from a cavity in the lungs, or an empyema, was remarked upon at the time. The abscess may discharge into the mediastinum. A remarkable instance of the kind is recorded in the case of the late much lamented Dr. Fuller. A chronic abscess of the bronchial gland had opened into the posterior mediastinum. This led to pyæmia, the formation of abscesses in the brain, and to the loss of a valuable life.

c. These glands are liable to suffer especially from *tuberculous or scrofulous disease*; from various forms of *malignant disease*; and in cases of *secondary or tertiary syphilis*. Of the latter form of disease, some striking examples have fallen under the notice of the writer, in which symptoms closely resembling phthisis existed, but which yielded to treatment directed to the specific disease.

With respect to the *ætiology* of the diseases of the bronchial glands, it will be sufficient merely to allude, amongst *predisposing causes*, to hereditary predisposition, to general impairment of health, and the like. MM. Rilliez and Barthez have described the frequency of the disease in childhood. My own observations made on young persons and adults show that in fifty-nine cases, twenty-one were males and thirty-six females (in one case the sex was not recorded). Of these, two were under 10 years of age, nine were between 10 and 20 years of age, eighteen were between 20 and 30, and twenty-six were over 30 years of age; while in three cases the age was not stated. If these observations justify any inference, it is that females are more liable to disease of the bronchial glands than males, and that the disease occurs with increasing frequency after the age of puberty. Amongst the *exciting causes* of disease in these glands, I need not do more than mention those general conditions which give rise to disease in glands generally, such as scrofula, tubercle, malignant disease, etc., and will pass on to the consideration of the more immediate *local exciting causes*. *Cold* leads frequently to congestion and enlargement of the bronchial glands. But it is to local irritation or inflammatory disease in organs or tissues with which these glands have a connection, that the source of disease may be frequently traced. As we find the submaxillary or cervical lymphatic glands enlarged from irritation or disease in the mouth or throat, or the axillary glands or the inguinal glands enlarged from irritation or inflammation about the hands and feet, so we may find the bronchial glands enlarged temporarily or permanently from inflammatory disease in parts whose lymphatics pass to these glands. They have been observed to be enlarged in the course of or after certain acute specific diseases, such as scarlet fever, measles, and typhoid fever. In whooping-cough, this enlargement has been so frequently observed by M. Guéneau de Mussy, that he believes this disease to be an exanthem of the bronchial mucous membrane, and that this local disease leads to enlargement of the glands, which, again, by pressure on the pneumogastric and recurrent nerves, gives rise to some of the special phenomena of the disease, such as crowing cough, and even to the vomiting frequently observed in this disease. It is right to remark here that the late Dr. Hugh Ley speaks interrogatively, in his work on *Laryngismus Stridulus*, of enlarged bronchial glands being capable of producing a

cough like whooping-cough; and he further alludes to some cases of whooping-cough in which the glands by the side of the trachea were enlarged. He asks, "May it not be that an enlargement of these glands from a specific animal poison, similar to that of the parotid gland in mumps, is after all the cause of whooping-cough?" (Note, p. 440.) The same author gives several beautiful illustrations of diseased bronchial glands pressing upon the pneumogastric and other nerves. The black deposit so often found in the glands is the result of its absorption from the lungs.

The *symptoms* which I have observed as more or less characteristic of the presence of enlargement of the bronchial glands are the following.

1. *Cough* is noted as being a prominent symptom in thirty-nine cases. In twenty-one of these cases, it was stated to have been the most troublesome of the symptoms present. In six cases, it was described as harsh and laryngeal; in four cases, spasmodic, resembling whooping-cough. In the other cases, five in number, it was characterised as short and hacking, constant, incessant; and in one case, the sound resembled that made by the cough of a sheep.

2. *Pain* is, in regard to the frequency of its occurrence, the next symptom recorded. It was mentioned as being present in twenty-two of the cases observed by the writer. The seat of pain was almost constantly referred to the situation of the fourth and fifth dorsal vertebræ at one or both sides of the spinal column. The pain was mentioned in a few cases as existing only in front, beneath and at one or both sides of the upper end of the sternum and below the clavicles. The feeling was described in some cases (five) as of distressing tightness, and in one case as a "spasm". Tenderness on pressure over the seat of pain was very frequently observed. The persistence of the pain was very varied.

3. *Difficulty of breathing* was a noticeable symptom in several cases. In thirteen, it was recorded as being specially so; in four, it had all the character of spasmodic asthma, occurring at intervals and especially during the night.

4. *Difficulty of swallowing* was noticed in ten cases; in one of these the difficulty was remarked especially in swallowing liquids.

5. *Hæmoptysis* was present in ten cases. The amount of blood varied in these cases from marked streaks to copious expectoration, lasting two or three days. No case was recorded as presenting this symptom, except on tolerably clear proof that it depended on bronchial gland enlargement, and on no other cause.

6. *Congestion and puffiness of the face* were noted as present in three cases.

7. *Expectoration of mucus*, such as results from bronchial catarrh, was frequently present. Expectoration of pus was present in three cases. In each it resembled the contents of an ordinary glandular abscess mixed with air. In one of these, the discharge was intermittent. The frequent occurrence of cough, without any expectoration, was remarked in many cases. Calcareous particles are mentioned also as having been expectorated.

8. *Loss of voice* (four cases) and hoarseness (two cases) are recorded as striking symptoms.

9. *Vomiting* is mentioned as having been present twice.

10. Lastly, the *position* assumed with least discomfort by the patient when lying down was noticed in forty-one cases. Of these, twenty-three rested on that side on which the glands were mentioned as being chiefly if not wholly affected. In fifteen cases, an opposite condition was noticed. In two cases, lying on the back was the most comfortable position. One patient, unable to lie down, sat when in bed, and stooped forward. One patient, a little boy, could only rest on his face, elbows, and knees. This case was further remarkable in reference to the clearness with which the disease was recognised and the successful result of subsequent treatment.

It might be mentioned here incidentally that the glands of the right side were noticed as being chiefly affected in twenty-eight cases, and those of the left in twenty-two cases; in four, both sides seemed equally affected, and in four no record was made.

The *general or constitutional symptoms* connected with the malady under notice are in nowise peculiar. The symptoms described above have special reference to these glands. The cough and its peculiar characteristics are, no doubt, in a great measure dependent on pressure or on irritation communicated to the pneumogastric nerves and their branches. So likewise pain and difficulty of breathing, in a great degree, through direct pressure on the air-passages, may also cause or aggravate this symptom. Aphonia especially seems to have relation to the condition of the recurrent nerves. In one of the cases which the writer saw with Mr. Lennox Browne, paralysis of the left chorda vocalis existed. The diagnosis of glandular disease was clear, a conclusion confirmed by the results of treatment. Vomiting is mentioned in two

cases. M. Guéneau de Mussy says this result is more frequent when the left pneumogastric nerve is pressed upon. He sees a connection between the troublesome vomiting which occurs in some cases of tubercular disease of the lungs with like pressure on nerves. The puffiness of the face and eyes noticed in these cases is due to the pressure on the venous trunks, a condition which also accounts, not only for hæmoptysis, but for bleeding from the nose, occasionally present. Copious and sometimes persistent hæmoptysis has been traced to the perforation of a vessel (ulceration in connection with disease of the glands).

Physical examination is of great importance in confirming the diagnosis that may be suggested by the presence of the symptoms just described. The following were the physical signs elicited in the fifty-nine cases referred to.

1. *Dulness* was present in forty-seven cases. It was found between the margin of the scapula and the spinal column at one or both sides, on a level with the fourth and fifth dorsal vertebra. It varied in degree, was more readily manifested when the muscles of the back were made tense by folding the arms across the chest, and was often strikingly distinct when one side was contrasted with the other. Dulness was present in front in eight cases (whether coincidentally with dulness at the back or not is not clearly stated), beneath the top of the sternum and at each side below the sterno-clavicular junction. The dulness here was best elicited by the patient holding the head backwards whilst percussion was being made.

2. *Flattening* of the affected side in front was mentioned in three cases. *Diminished mobility* of the affected side, independently of flattening, was recorded in four cases. *Prominence* in front was not recorded in any case, though, no doubt, it may occur.

3. *The respiratory sounds* were variously modified. *Marked tubular breathing* was recorded as being present over the seat of disease in fourteen cases. In ten, the expiratory murmur was described as being *very loud*, various modifications of the inspiratory murmur being found at the same time. *Feebleness* of the respiratory murmur as a whole was noticed in fourteen cases. In some, this deficiency extended over the whole lung; in others it existed over the upper or lower portion of a lung, behind or in front. The observations made on the voice by the writer were few, but M. Guéneau de Mussy and M. Lereboullet speak of a peculiar and increased reverberation of both the voice and the cough. Dr. Eustace Smith has described a venous hum, heard at the root of the neck when the head is thrown back, caused by the pressure of the enlarged glands on the venous trunks in children.

The symptoms and signs above described will generally suffice for the *diagnosis* of diseases of the bronchial glands. It is, of course, necessary always to remember that, in the present and all similar instances, means have to be taken for excluding diseases which may produce like phenomena. Thus we may find cough, pain, tenderness on pressure, and aphonia, in a case of hysteria, without any evident structural disease. On the other hand, a small tumour, say a small aneurism, may produce all the signs of pressure which are above given as the signs of bronchial gland enlargement. It is the duty of the physician to recognise these differences and distinctions by tracing the effects to their sources.

The *prognosis* will in this, as in similar instances, so entirely depend on the nature of the disease, on its amount and its condition, on its relation to and effects on surrounding organs and textures, that each case must be regarded independently. It would be impossible to discuss them fully here—all that can be said is that simple enlargements generally yield to treatment, and within a reasonable period.

In several cases of bronchial gland enlargement, *treatment* has proved very effective. Such cases would seem to be those of simple chronic enlargement. Many such have yielded to the use of iodide of iron in the form of pills or syrup, and to the external application of a solution of iodine, composed of equal parts of the tincture and the liniment of iodine, between the shoulders. The same treatment has likewise proved very effective in cases in which a syphilitic origin for the disease could be traced. Symptoms such as cough, difficulty of breathing, pain as well as dyspnoea, loss of flesh, strength, etc., will all require more or less suitable treatment. The cough and difficulty of breathing may in some cases be relieved by simple expectorants or antispasmodics. A useful application, when pain is a prominent symptom, is an embrocation composed of equal parts of chloroform, belladonna liniment, laudanum, and spirits of camphor. A couple of drachms of this composition sprinkled on the surface of piline, and applied on the painful part for a few minutes, often affords relief. Hypodermic injection of morphia may be required when pain is very severe. Under all circumstances, it is necessary to improve the general health by wholesome diet, pure air, and those other conditions which promote good digestion and elimination from the excreting organs.

EXCISION OF A FIBRO-CYSTIC UTERINE TUMOUR.

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In a lecture delivered at the Royal College of Surgeons, on the 21st of last June, and published in the *BRITISH MEDICAL JOURNAL*, July 27th, 1878, I gave particulars of twenty-four cases in which I had removed uterine tumours through an incised opening in the abdominal wall. Of these, twenty were solid tumours and only four fibro-cystic. Since that lecture was published, I have removed another fibro-cystic tumour, and the case is interesting both in relation to diagnosis and treatment.

On July 24th, 1878, Mr. Cowan of Bath wrote to ask me to see a lady who was leaving for London that day, in order to consult me by his desire and that of Dr. Swayne of Clifton. The next day, I saw this lady, thirty-nine years of age, suffering considerable abdominal pain and difficulty of breathing after her journey. I found that she had been married four years, and had not been pregnant. The catamenia were regular, and a period was due. She was suffering so much that I did not make a complete examination; and the next day, the suffering was so great that I tapped a large cyst, felt between the umbilicus and the sternum, and removed nineteen pints of dark fluid, with which (as the cyst became empty) a little blood was mixed. A large semisolid tumour, reaching a little above the umbilical level, was then felt, and a harder portion was found in the right iliac fossa, which, by combined external and internal examination and the use of the sound, was ascertained to be the uterus, high up and to the right, closely connected with the lower portion of the tumour, but apparently separate the one from the other.

Mr. Cowan informed me that the illness commenced in the summer of 1876, in Italy, whither the patient had gone to recruit after great mental strain. The first symptoms were dull pain in the left iliac region, with a sense of fulness, pain on pressure, and constipation, followed by a steady increase in size till February 1877, when he (Mr. Cowan) found "fluctuation in the left iliac region, and a solid tumour passing down into the pelvis anterior to the uterus". There was steady but slow increase until October 1877, when sudden painful swelling of the left leg set in, with acute pain in the left groin. After a fortnight, this subsided, but the cyst increased more rapidly, and a solid mass was found to the right of the median line in the umbilical region. Dyspnoea and general distress increased, and walking became difficult.

My diagnosis was a multilocular ovarian cyst, displacing the uterus upwards and to the right. This was confirmed by an examination by Mr. Thornton of the fluid removed by tapping, who reported it as "not differing in any way from ordinary ovarian fluid, except the blood, which is fresh, and probably from some accidental wound of a vessel. Now the blood has settled, it looks like the ordinary 'linseed-tea' fluid, and the tests and microscope confirm its ovarian characters."

Great relief followed the tapping. The catamenia came on, and ceased on August 1st. But the fluid began to collect again, and some interference with respiration became an increasing trouble. Dr. Day examined the chest on August 10th, and found some dulness on the lower part of the left lung, which he attributed to pressure. We, therefore, decided on removal of the tumour.

I performed the operation on August 12th, under spray and with strict antiseptic precautions, assisted by Dr. Bantock, Dr. Woodham Webb, and Mr. Cowan of Bath, Dr. Day administering methylene. By an incision, five inches long, in the median line between the umbilicus and symphysis pubis, a very thin cyst was exposed. It was bluish in appearance, like the peritoneum. On tapping it, reddish serum escaped. Extensive adhesions to the abdominal wall above, and to the intestines behind and to the left, were separated, and the empty cyst was drawn out with a mass of solid substance at its base. I then found that both ovaries were healthy; that the uterus was about twice the normal size, irregularly nodulated and hardened; and the tumour was an outgrowth from the back part of the fundus. The connecting medium or pedicle was fully an inch in length, and about two inches in breadth and one in thickness. I secured this in a large clamp and divided the attachment. Then I had to dissect off the back part of the tumour from the sigmoid flexure of the colon and from the rectum, with scissors. In doing this, I accidentally made an opening into the upper part of the rectum, about an inch long, but sewed it up immediately with an uninterrupted suture, carefully sponged out the peritoneal and pelvic cavities, secured several bleeding vessels in parts where adhesions