form, made efforts to vomit. The nerve was the pneumogastric. The peculiar breathing continued until the nerve had been quite released from the tumour and the grasp of the forceps. On the inner side, the tumour had adhering to it the upper part of the common carotid and the first portion of the external carotid arteries, for about two inches. Posteriorly, it was necessary to dissect away the trunk of the sympathetic nerve, as the tumour rested upon the transverse processes of the vertebrae. The whole of the growth was removed in one piece; the internal jugular vein was not found in any way attached to the same. At the conclusion of the operation, the pupil of the right eye was seen to be contracted to the size of a pin's head.

August 19th. The patient had been very restless, and had made continuous efforts to vomit. She complained merely of slight pain in the neck.

August 20th. The child was weaker, and made incessant efforts to vomit. I ordered an half-ounce enema of brandy and milk, to be given thrice in twenty-four hours.

August 21st. The child was brighter, and only vomited once. The pupil of the right eye was irregularly contracted, as at the conclusion of the operation, but acted a little under the stimulus of a strong light. There was also drooping of the upper lid, and well-marked diminution in the size of the palpebral fissure. The sight of the eye was unimpaired.

August 22nd. All vomiting had ceased. The lungs were examined, and nothing abnormal detected. Teaspoonful doses of beef-tea were given. With regard to the further progress of the wound, there was nothing of note. By the 10th of September, healing was complete. A microscopic examination showed the tumour to be a mixed sarcoma, in which spindle-cells preponderated.

August 29th. A drop of atropine was placed in the affected eye, and the pupil very slowly dilated under its action. In a few days it contracted to the same size as before. At this date, also, a slight exudation of pus was perceived immediately over the occipital protuberance. Subsequently, a piece of the scalp, of the size of half-a-crown, separated as a slough, leaving the occipital bone at that point quite bare. From its median position, I believe this sloughing was due to pressure from continuously lying on the back, and not to any trophic influence.

October 18th. (Two months after the operation). An examination of the eyes was kindly made for me by Mr. Eales, at the Eye Hospital; the following is his report: "Pupil of right eye contracted irregularly, but responds slowly to alterations in the intensity of light. Accommodation good, as in the other eye. Vision normal ($V = \frac{15}{25}$). With the ophthalmoscope, no appreciable difference can be detected in the size of the vessels of the retina."

December 18th (two months later). The narrowing of the palpebral fissure was hardly perceptible; ptosis was slight. The pupil was larger than it had been, but was not equal in size to its fellow. There was no emaciation of the cheek, and no flushings or redness of the conjunctiva on the affected side had been noticed. The child's general health was good.

It was not possible, after the operation, to compare the temperatures of the auditory meatus, in consequence of the continuous vomiting, restlessness, and general signs of fear exhibited when the patient was approached.

To what may be attributed the condition of the right eye? Petit observed in 1727, and Boffi in 1746, that the cervical sympathetic nerve exercised a certain influence over the movement of the pupil, producing on division contraction of the same, and a drawing inwards of the eye. Claude Bernard subsequently pointed out that this contracted state of the pupil was accompanied by retraction of the globe of the eye, flattening of the cornea, and decrease in size of the palpebral fissure. In the case under notice, the chief points of interest, after removal of the tumour, were irregular myosis, narrowing of the palpebral fissure, and slight ptosis. It is generally accepted that the dilating fibres of the iris receive their nerve-supply through the cervical sympathetic. Remak refers the decrease in size of the palpebral fissure and the ptosis, when the cervical sympathetic is paralysed, to an alteration in the muscular actions of the levator palpebrae, orbicularis palpebrarum, and the retractor plicae semilunaris; and thinks that these muscles are under the control of a tonic power communicated through this nerve trunk. The dissection necessary to remove the sarcoma had to be carefully performed; and, the bleeding being only slight, every cut with the knife was readily seen, and, as far as could be ascertained, no nerves were divided; but, at the same time, it is quite possible that some very minute communicating branches may unknowingly have been cut. The trunk of the cervical sympathetic was grasped and held for some time in a pair of forceps, while it was freed from an adhering tumour: hence a pinching of the nerve-elements

and consequent interference with the functions of the nerve. That a similar pressure caused some perverted action of the vagus, the continuous and uncontrollable efforts to vomit seem to indicate; that the injury inflicted may not have been so severe, as to the sympathetic, is possibly due to the fundamental differences in the fibres which compose the nerve trunk. That there was no division of the larger fibres of the sympathetic, may be inferred from the absence of any signs of flushing of the face and reddening of the conjunctiva, indicating vaso-motor derangement; and also from the fact that emaciation of the face, and constant increase in temperature of the affected side, have been noted in cases where such an injury has occurred from gun-shot wounds. (*Vide* Cases by Seeligmüller and Bernhardt, *Berliner Klin. Wochenschrift*, 1872. Nos. 4, 47, 48.)

Will the eye ever recover? Eulenberg and Guttman, experimenting upon animals, found that, in dogs, there was contraction of the pupil four months after the trunks of the sympathetic and vagus nerves had been divided on the left side of the neck. Kampf brought a case before the Society of Physicians in Vienna, in which existed a permanently contracted state of the right pupil, following a stab on the edge of the sterno-mastoid muscle, which was unaffected even by electricity. In my patient, six months after removal of the tumour, all the oculo-pupillary symptoms had much improved; but, since that time, they have remained *in statu quo*. Fifteen months having now elapsed, it seems doubtful if the normal condition will ever be regained.

THE CURABILITY OF PHTHISIS AT HIGH ALTITUDES.

By C. THEODORE WILLIAMS, M.A., M.D., F.R.C.P.,

Physician to the Hospital for Consumption, Brompton.

IN the BRITISH MEDICAL JOURNAL, of October 1st, is a note on the above title, the writer of which, while admitting the possibility of expansion of the bases of the lungs from compensatory hypertrophy, hardly allows the existence of a similar process taking place at the apices. He also protests against the too sanguine views put forward about the arrest of phthisis through this alveolar dilatation; and he states "that the experience of every physician will supply him with cases of phthisis, in which, after a longer or shorter period of quiescence", under high altitude conditions, "a further extension of the disease has occurred with extreme rapidity".

As the writer appears to allude to certain views put forward by me, in a paper read before the International Medical Congress, in August, "On the Treatment of Phthisis by Residence at High Altitudes", I take the opportunity of correcting some inaccuracies which have crept into his statements, and which mar the logic of my conclusions; and I do this because some time may yet elapse before the *Transactions* of the International Congress appear, which will include the paper, with all its facts and reasonings.

My data as to the increase in the size of the chest, after a residence at high altitudes, were based, not on spirometrical observations, as the writer of the article assumes, but on measurements of the chest-wall at different levels, made either with Hare's tapes or with the cyrtometer; and these, carried out in a large number of cases, led me to the following conclusions.

1. A greater dilatation of the chest-wall takes place than can be accounted for by any accumulation of fat or muscle, and this even occurs in bed-ridden patients, who may be also losing weight.

2. While it may occur in any part of the thorax, it is more common in the upper regions, and most frequent of all at the level of the third rib.

3. It is oftener found in women than in men; and its amount depends, to some extent, on the yielding or non-yielding condition of the thoracic wall. The changes in the lung-tissue which give rise to these modifications in the form of the thorax, as far as I can ascertain them by percussion and auscultation, are: (1) partial absorption of the pneumonic consolidations; (2) shrinking and cicatrization of the tuberculous masses, and development of emphysema in this neighbourhood, similar to that found in *post mortem* examinations of arrested phthisis; (3) hypertrophy of the healthy lung-tissue. The existence of this last I deduce from the physical signs, and it may also be inferred from the improved breathing powers of the patients, as shown by their daily ascents, which previously would have been impossible of accomplishment.

I have not used the spirometer in these cases, and am quite as alive as the writer of the note to "the many difficulties surrounding the application of spirometry to practice", though most of these are over-

come in the admirable instrument recently constructed and exhibited by Dr. Marcet.

With regard to the question of whether a further "extension of the disease takes place with extreme rapidity in the dilated, and therefore not quite healthy, lung", my experience differs from the writer's, though the length of time that the Davos treatment has been in use precludes our speaking too confidently of permanent arrest of disease by this method; yet, out of the twenty-two cases given in my table, I could instance several of the early ones who passed the two last severe winters in England without any return of pulmonary symptoms, and entirely without any extension of the disease. Most of them remain under observation, and appear to stand the fitful changes of this variable climate remarkably well. The expansion of the chest has been noted by many others besides myself, and was found by Dr. Ruedi to occur at Davos in 90 per cent. of the patients; and the remarkable fact is, that its occurrence coincides with a diminution in the rate of respiration and with an increase of their depth.

This dilatation is not always permanent, but sometimes is reduced on returning to lower levels; and I saw a curious instance of this in a gentleman, a native of Denver, U.S.A. (5,200 feet), the circumference of whose chest, after a residence of two months on the shores of the Lake of Geneva (1200 feet), diminished one inch, though he increased in weight. The fact of the enlarged thoraces of the inhabitants of various mountain ranges, such as the Andes, and Himalayas, has been proved by numerous competent observers; and, this last autumn, some measurements I made of the Chamonix guides confirmed it entirely.

The antiseptic qualities of high altitudes are doubtless of great value, and go far towards reducing the discharge from the ulcers and abscesses present in tuberculous lungs; but we must remember that these qualities are not the sole property of high altitudes. They are possessed by very cold climates, at high or low levels, as in the Arctic regions, in parts of Canada and Russia; and in very dry inland ones, as in the Egyptian Desert; or, again, in the ocean. But, diminished atmospheric pressure is peculiar to high altitudes; and it is to this we must look for the explanation of the remarkable changes in the thorax and its contents.

Having thus stated my views on this subject, I will close by a few words on the kind of cases of phthisis which do best at high altitudes. Ordinary chronic tubercular disease, provided the mischief be limited to the upper lobe of one lung, the constitutional powers be good, and pyrexia be absent, is well suited; the question of consolidation or excavation not being of much importance if the lesion be limited and a large respiratory surface be not involved. To this it may be objected that this is just the class of phthisis which does well anywhere, in hot or in cold climates; and that, in selecting this form, I simply select the most favourable cases. I admit this, but then I expect greater results from high altitude treatment than I have ever found arise from other climatic treatment. My experience leads me to conclude that one, or at most two, winters will cause an entire arrest of the above form of consumptive disease, and that the patient will be able afterwards to resume active life in England. Another class is hæmorrhagic phthisis, which gives remarkably good results at Davos. A third is phthisis originating in pneumonia or pleuropneumonia, provided only one lung be attacked, and only part of this not undergoing fibrosis.

The cases in which mountain treatment is contraindicated are: all forms of phthisis, acute or chronic, accompanied by pyrexia; also all cases of either advanced or of extensive tubercular disease, the objection being that such patients have neither the power of circulation to resist the cold, nor the amount of lung-surface necessary to aerate the blood in the rarefied atmosphere; also cases of phthisis in which catarrhal symptoms are the chief feature. These often improve greatly in general health at Davos, but the cough, instead of diminishing, increases; and in one of my patients of this class, catarrh of the larynx, causing obstinate aphonia, came on, this symptom subsiding later on during the hot weather in England. Such patients flourish in moist warmth, and are therefore more fitted for sea-voyages, or for Madeira; and the dictum of Biermer—the south heals catarrh, but the Alpine climate improves the constitution—has amply been borne out by my experience. It is the cold that affects this class of patients unfavourably; and it is possible that, where warmth is combined with altitude, as in the South African health-resorts or in the Andean, such as Quito or Santa Fé di Bogota, they may thrive.

In conclusion, what are patients to do when the snow melting necessitates their quitting Davos, which is generally the case at the end of March or the beginning of April? It is the custom to send them to Baden-Baden, or to one of the towns on the north-eastern bank of the Lake of Geneva, there to remain either till the summer commences in England or till the valley of Davos is free from snow. I do not hold

with this practice at all, for I think it undesirable to place patients who have been undergoing a strictly bracing climatic treatment, under conditions which are more or less relaxing, such as at Baden-Baden, with its cauldron of hot springs, or on the banks of a lake, where moisture must be abundant in the atmosphere. The descent from an altitude of 5,000 feet should be made gradually, for fear of inducing hæmoptysis, which, though rare at Davos, occurs sometimes in patients after quitting it. The route to be followed is the Landwasser road to Thusis and Coire, and a halt of fourteen days should be made at the former place, which, standing at a height of 2,448 feet at the mouth of the Via Mala, and provided with fair hotels, is a good intermediate station. The next halt should be at Berne (1,765 feet) for a week, and the patient can then return slowly to England, reaching this country in the beginning of May, where, with a well braced system and with improved powers of taking exercise, he or she will not fear, but rather approve of our cold winds. This plan I have tried for now two seasons, and have found it fairly successful, and would recommend it to other physicians.

CASE OF MULTIPLE EXOSTOSES.*

By G. E. SHUTTLEWORTH, B.A., M.D.,

Medical Superintendent of the Royal Albert Asylum, Lancaster.

A. B., an imbecile boy aged 13, for several years past an inmate of the Royal Albert Asylum, has at least sixty growths from, and enlargements of, bones in different parts of his body. His general health is good; his physical development moderate (height, 4 ft. 6 in.; weight, 72 lbs.), and his mental condition is that of idiocy of the milder type. The skull displays no marked external peculiarity; it is fairly symmetrical, and measures twenty-one inches in its greatest circumference. The features are regular, and the bones of the face appear normal; but the eyes are somewhat prominent. The thorax is of normal contour and capacity. On the second, third, fifth, seventh, and ninth ribs of the right side, and on the second, third, sixth, and seventh ribs of the left side, there are palpable nodules near the junction of the bone with the cartilages. The sternum and spine appear to be unaffected. The pelvis displays posteriorly on each side an exostosis; that on the right side, of the size of a filbert, being near the posterior superior iliac spine, that on the left being smaller and lower in its position. The bones of the extremities are so studded with exostoses that they will be best described under a tabular form, as follows:

RIGHT SIDE.		LEFT SIDE.	
<i>Clavicle:</i>			
1. Small nodule, sternal end.		1. Larger nodule, sternal end.	
<i>Scapula:</i>			
1. Growth (two inches across) from superior angle, filling up part of supraspinous fossa.		1. Three nodules on spine.	
2. Three nodules along vertebral border.		2. Nodule in infraspinous fossa.	
3. Massive exostosis in subscapular fossa, causing outward projection of scapula.		3. Thickening of inferior angle.	
		4. Nodule in subscapular fossa, projecting scapula, but less than on right side.	
<i>Humerus:</i>			
1. Exostosis (size of walnut) on external border (upper third).		1. Series of coalesced exostoses on external border (upper third).	
2. Smaller nodule attached to internal border.		2. Nodule (size of small orange) projecting into axilla.	
3. Small nodule projecting into axilla.		3. Exostoses on each side of bicipital groove.	
<i>Radius and Ulna:</i>			
1. Head of radius enlarged.		1. Head of radius enlarged.	
2. Nodule lower end of radius.		2. Mass of coalesced exostoses at lower ends of bones, projecting on radial side.	
3. Nodule lower end of ulna.			
<i>Metacarpal Bones:</i>			
1. Small nodules at end of each bone.		1. Corresponding exostoses.	
2. Nodules on dorsal surfaces of first and middle metacarpal bones.			
<i>Phalanges:</i>			
1. Small nodules on dorsal surfaces of first phalanges.		1. Corresponding exostoses.	
2. Small nodules on dorsal surfaces of second phalanges.		2. Corresponding exostoses.	

* Read before the Lancashire and Cheshire Branch.