59 and 60), but not one of these cases, unfortunately, is capable of affording any conclusive evidence on the point now in question. Some of them are doubtful cases, where there was more than one lesion; others are cases in which the lesion was too extensive to be at all conclusive; and others again are cases in which no adequate clinical details are given to enable us to say whether the defect of speech from which the patient suffered was aphasic or aphemic in character. This is a point, therefore, to which I hope future workers will direct special attention, both clinically and in *post-mortem* examinations, in order that we may know for certain whether with Broca's region thoroughly intact, but with a lesion in the left centrum ovale or internal capsule (cutting across or otherwise damaging the fibres between this centre and the motor centres of the bulb), the speech defect is of the kind which I name aphemia, that is with mental power intact, so that if the hand be not paralysed, thoughts can be expressed freely, by writing, and if speech be not entirely lost, of such a kind that the patient will, when bidden, make an attempt (however rude) to pronounce any simple word or vowel sound, whilst the true aphasic patient will not, when bidden, attempt to repeat the most simple word, or even one of the words or sounds which he often utters of his own accord as one of his stock expressions.

The fact that double lesions of these internuncial fibres lead to a clinical condition closely resembling that of bulbar paralysis is now well recognised. Several instances of this kind have been recorded by Ross (*Brain*, vol. v, 1882-83, p. 143). More recently referring to these cases, he says (*On Aphasia*, p. 105): "The first which came under our observation was kindly sent by Dr. Leech. The patient presented all the symptoms commonly observed in cases of progressive labio-glosso-laryngeal paralysis, but at the necropsy, conducted by Professor W. H. Young, 'each cerebral hemisphere presented a single well-defined cystic cavity, containing clear straw-coloured fluid, and occupying the position of the lenticular nuclei,' while the medulla oblongata was free from disease. As these cavities, especially the one on the right side, were larger than the normal size of the lenticular nuclei, the fluid doubtless compressed and injured the motor conducting paths of the internal capsules." My contention, however, is that mere pressure upon or destruction of the conducting (internuncial) fibres on the left side alone would produce such a defect of speech, and that the only result of the addition of a similar lesion in the right hemisphere is to make the case absolutely incurable, since no restoration of speech could then possibly be brought about in the manner suggested by Broadbent, that is by conduction of the speech stimuli from the left to the right region of Broca, through callosal fibres, and thence downwards to the bulb.² Other points of some interest must now be referred to in regard to this particular kind of speech defect.

First of all the question arises, whether such defects are always functional or of so-called "hysterical" type. My rejection of this notion is clear from what I have already said in regard to its causation.

Secondly, comes the question whether they are not, like almost all other forms of speech defect, occasionally of functional type, and of more or less brief duration. To this view I should assent.

Thirdly, the question arises as to the part of the brain which is at fault in these cases of aphemia which are of functional type, or not caused by "gross" lesions. I maintain that in such cases we cannot imagine the defective function to be that of any set of afferent fibres, nor of the cortex, seeing that lesions neither of the word centres, nor of either of the sets of commissural fibres between them, would suffice for the production of the uncomplicated aphemic group of symptoms.

I raise these latter questions because it seems to me that the powers and disabilities encountered and so well described by Charcot in what he terms "Hysterical Mutism in the Male," agree exactly with the condition which I name complete aphemia.³ All I would urge, however, is the very strong probability that such a state cannot be caused by functional defects in parts usually implicated in hysteria (that is, either of afferent fibres or cortical centres), and that this particular kind of speechlessness, which I name aphemia, can only be accounted for by a defect either functional or structural in the course of the left

internuncial fibres connecting Broca's region with the bulbar motor centres.

No isolated defect of writing corresponding with aphemia as a speech defect seems to exist in a recognisable form. This is due to the fact that a lesion involving the internuncial fibres between the cheiro-kinæsthetic centres and the motor centres in the cervical region of the cord, in any part of their extent, would almost certainly cause paralysis of the hand also for movements other than those concerned with writing. Thus the mere agraphic defect would be merged in and concealed by a wider form of paralysis. The reason why this same kind of result does not occur in the aphemic class of cases is because here, even though the internuncial channels may be blocked in the left hemisphere, by means of which the specially combined movements needed for articulate speech are called into play, the right hemisphere is still capable of calling into action the bilateral bulbar nuclei concerned with other less specialised movements of lips, tongue, and palate; consequently, it is only the articulatory movements of these organs that are paralysed in a case of aphemia. The special paralysis of speech is not merged in a wider defect simply because, for the actuation of movements other than those of speech, the bilateral motor centres of the medulla may still be called into play by the undamaged right hemisphere. If the result is different in the case of writing with the right hand, this is simply due to the fact that here we have to do with unilateral motor centres, and that these unilateral centres in the right cervical region of the cord can only be roused into activity by fibres proceeding from the left cheiro-kinæsthetic centre, and that the internuncial fibres concerned with writing movements are so intimately mixed up in their course from the cortex downwards with the internuncial fibres concerned with other movements of the right arm and hand, that agraphia as an isolated defect cannot be produced—that is, it is almost certain to be associated with paralysis of other less specialised movements, and thus to be unrecognisable as a distinct defect parallel with aphemia.

It seems clear, moreover, that in the remarkable case of agraphia recorded by Pitres (*Rev. de Médecine*, November, 1884, p. 855) there was a defect of the cheiro-kinæsthetic centre itself, and not of the internuncial fibres leading from it; because in the latter event there would not have been the existence of a sign which was met with in this particular case of agraphia—namely, diminution of "muscular sense" in the right hand.

It will be seen that no reference has been made in this communication to the very interesting defects of speech and writing in which wrong words rather than no words are used—that is, to cases which are now commonly spoken of under the head of paraphasia and paragrammia respectively. This omission has not been because I in the least underrate the great interest attaching to this kind of defect in intellectual expression, but because I hesitate to trespass longer upon the time of the meeting, and feel that many distinct issues have already been raised which will afford abundant scope for discussion, and issues, too, of a kind which are more fundamental and less purely theoretical than any pertaining to those divisions of the subject concerning which I have been silent.

THE TREATMENT OF PULMONARY CONSUMPTION AT HIGH ALTITUDES.

By A. TUCKER WISE, M.D., Maloja.

As the results of high altitude treatment in the following twenty-three consecutive cases are highly satisfactory, I think a brief extract from my paper read before the Climatological Section of the International Medical Congress at Washington will prove interesting.

Putting aside all observations by instruments of precision, there is one unique feature of Swiss mountain climate which must be kept in mind, especially with respect to pulmonary troubles, namely, the possibility of respiring cold, dry air, without the sensation of feeling chilled and pinched by the low temperature. Various explanations have been given for this; the main reason, however, for the immunity from the sensation of cold is the small amount of watery vapour suspended in the air. Whether the dread of a low temperature exists in the minds of Americans to the same extent as amongst many English in Europe I am unable to say; this fancy, nevertheless, drives hundreds to the shores of the Riviera, who would obtain more amusement and do much better, as regards permanent benefit to their health, in the sunshine of the Alps.

The outdoor amusements, which enter really into a part of the

² The conclusions which Dr. Ross deduces from such cases, in favour of the view that Broca's region is a real motor centre (*loc. cit.*, pp. 106 and 107) are to my mind altogether invalid. He does not distinguish (p. 107) between the different effects which would result from destruction of muscular sense centres, and those that would result from mere severance, in some part of their course, of the afferent paths for muscular sense impressions. I would ask him whether the reasoning which he employs would not also lead him to conclude that the auditory word centre is a true motor centre, seeing that a cutting across of the fibres between it and Broca's region also produces aphasia, as I have previously shown.

³ See *Med. Press and Circ.*, June 2nd and July 6th, 1887, for a lecture on "Hysterical Mutism in the Male," by Professor Charcot.

"treatment" at these places, are skating, sleighing, tobogganing, and snow-shoeing, besides the ordinary exercise of walking, sitting out in the open air and in shelters, sketching, reading, etc. Indoor amusements are the usual ones of music, dancing, amateur and other concerts, theatricals, and various social gatherings. In the Engadine a day may be spent thus: At 8.30 or 9 A.M., breakfast; as soon as the sun appears on the snow a walk is taken, or the skates put on and the ice-rink visited. Some sit in shelters or on the ice watching the skaters, protected from the glaring sun by smoked-glass spectacles and parasols. About 12.30 P.M. lunch is taken. Those desirous of getting as much open air exposure as possible have their lunch sent to them on the ice or in the wooden sheds constructed for these purposes. After lunch the skates can be changed for the toboggan, or a sleigh-drive taken to some village or place of interest. A snow-shoeing party may be got up, and a small excursion made to the inaccessible nooks of the woods and side valleys, all of which are rendered easy of exploration by the Canadian snow-shoe. Picnics, too, are often undertaken in this way or by sleigh, combined with a run down a sloping

road on the Canadian sled. The temperature on these occasions may be from 15° to 20° Fahr.; the snow and roads are quite dry, and a shawl thrown over the surface of the crisp dusty snow serves well for reclining or sitting down.

As I am chiefly responsible for bringing forward both Wiesen and Maloja as winter resorts for early pulmonary cases, it is a satisfaction for me to be able to show some results which have been obtained by winter residence at the latter place. Details of the climates of Wiesen and Maloja can be found in the third edition of my "*Alpine Winter*" (Churchill).

The treatment in the following cases varied somewhat with each patient, and consisted of graduated exercise, with suitable clothing and diet, plenty of fresh air, dry cupping, medical rubbing, and counter-irritation; milk, cod-liver oil, and medicines when circumstances demanded it; drugs were, however, avoided as much as possible. The cases are taken as they occurred in my notebook of pulmonary complaints of the past winter; there are no omissions of unsatisfactory results.

No.	Condition of Patient.	Age.	Duration of Residence.	Weight Gained.	Weight Lost.	Diminution in Pulse rate.	Remarks.
1	Congestion of right apex	26	4½ months	lbs. 13	—	None	Remarkable improvement.
2	Congestion of right apex	29	4½ "	2½	—	None	Great improvement.
3	Consolidation and catarrh of right lung after pleurisy	24	7½ "	—	—	16	Improved.
4	Consolidation of upper lobe of left lung	49	7½ "	—	1	None	Slight improvement.
5	Cavity of left apex communicating with the pleura, after empyema and excision of portions of three ribs; sinus still open	28	4½ "	4	—	4	General improvement.
6	Consolidation, excavation, and retraction of left lung	15	16 "	22	—	26	Remarkable improvement.
7	Incomplete absorption of inflammatory products after pneumonia; right apex affected	26	4½ "	4½	—	None	Great improvement.
8	Insidious consolidation of right apex	20	5 "	Not noted	Not noted	Not noted	Great improvement.
9	Harsh vesicular murmur over right apex	35	4½ "	4½	—	4	Great improvement.
10	Consolidation of right apex	27	4½ "	—	—	None	All signs of disease disappeared.
11	Congestion of right apex; hæmoptysis	32	28 days	4½	—	8	Marked improvement.
12	Consolidation of left apex	45	4½ months	—	15½	8	All signs of disease gone.
13	Convalescing, after pneumonia and typhoid fever	20	1 "	4½	—	8	Marked improvement.
14	Congestion and catarrh of right apex	40	3 "	Not noted	Not noted	None	General improvement.
15	Congestion and catarrh of left lung	19	4½ "	—	2	14	Slightly better.
16	Consolidation of left apex	40	1 "	Not noted	Not noted	36	Marked improvement.
17	Congestion and catarrh of both apices	23	4½ "	10	—	8	All signs of disease gone.
18	Consolidation of the whole of left lung	37	4 "	—	5	16	No improvement.
19	Consolidation of both apices	23	4½ "	14½	—	34	Remarkable improvement.
20	Consolidation and catarrh of right lung	43	3 "	1½	—	8	Slight improvement.
21	Congestion of left apex	23	5½ "	8½	—	8	Great improvement.
22	Congestion of left apex	22	4½ "	15½	—	12	Remarkable improvement.
23	Imperfect development of apices of lungs	19	2 "	—	1½	16	Improved.

THE ALPINE CURE: LES AVANTS, A WINTER RESORT.

By M. H. FEENY, M.R.C.S.E., L.R.C.P.E., L.M., Les Avants.

A WINTER station is now open at Les Avants, situated 3,300 feet above the sea-level, and about 2,000 feet above the Lake of Geneva. On the north, east, and west its shelter is complete; towards the south it looks on the Lake of Geneva, and the lovely and picturesque range of mountains that gird the lake's southern side. It possesses the two factors of the Alpine cure, the sunshine and the air.

In what does the Alpine cure consist? How is it effected, and what is the agent through which the result is attained?

Now that the bacillary nature of phthisis is established, the cure of that disease must consist either in the destruction of the organism, or the production of a state of things unfavourable to its multiplication and development. What is the behaviour of the high altitudes towards it? Are all the above characteristics of air combined with sunshine actually needed for its destruction, or would a minor combination of them be equally effective? We know that in warm climates, where there is abundant sunshine, and the air is dry, warm, and bracing, phthisis is unknown among the native residents, and invalids afflicted with this malady derive great and occasionally permanent relief. In these latter places the air is not still, rarefied, nor free from dust.

From this it would appear that with abundance of sunshine the air need only be dry, warm, pure, and bracing. And this, again, leads to the consideration of that very important quality of the high altitude air, its rarefaction. The rarefied atmosphere throws a new labour on the lungs, and an increased expansion of their tissues is the result. The amount of tidal air is increased, and a portion of what used to be reserve or supplemental air is replaced by it. Thus portions of lung

tissue that had hitherto remained passive, except in forcible or extraordinary breathing, now become active and dilated, and take part in the work of ordinary respiration. Measurements taken before and after residence here show an increase in the general chest-dimensions. Yet this effect seems only transitory, for on a return to sea-level and a denser atmosphere the chest again alters and returns to its original contracted dimensions. But the value of rarefaction in certain morbid conditions is undoubted. Apart from the temporary higher development of lung-tissue it produces, the remains of former acute troubles are often greatly benefited; adhesions are broken down or absorbed, consolidations disappear, and occasionally small cavities are obliterated. But this same quality may also become an element of danger, especially in these last-named cases. The tissues surrounding cavities are necessarily infiltrated, lowly organised, and degenerated. Under this new respiratory labour and increased expansion such tissues may readily give way; and should the yielding be in the direction of a blood-vessel, hæmorrhage, perhaps fatal, may be the result. Hence the caution with which cases that have undergone much softening must approach the higher altitudes. In such cases the care and discrimination of the physician will be taxed to the utmost in allotting to each individual case its suitable amount of exercise, and seeing that this is not exceeded. Rarefaction may thus become an element of danger. Again, the cases that do best in the high altitudes, namely, phthisis in its early stages, and those in which there is hereditary tendency to phthisis, have been known to do well at a warm, suitable, sea-level situation. From these considerations it would seem that rarefaction is not essential to the Alpine cure. If with abundant sunshine the air is dry, pure, still, and bracing, it will probably be found to fulfil all the necessary conditions for this cure.

Les Avants has long been known as a favourite spring and summer resort, but although the large hotel there is open all the year, it seems to have escaped notoriety as a winter station; and yet, while possessing all the characters of a winter resort, it has many advantages