the case of progressive atrophy the long flexors were obviously wasted, in that of lead paralysis less so, but the remarkably feeble grasp of the patient made me suspect something beyond the loss of the antagonistic effect of the extensors, and to my surprise I found the flexors flabby and yielding the characteristic reactions of degenerative change. This observation, as far as I am aware, is the first of its kind. The dictum, probably, that in lead palsy the flexors are *never* affected, has diverted the attention of observers from their electrical condition, the testing of which, it must be added, offers some difficulties. As it is, my observation curiously tallies with a statement of Remak, who observes, that owing to the proximity and physiological connexions of the spinal centres of the interossei and long flexors of the fingers, these muscles are often found involved together, and that when, as happens in certain cases of saturnism, the former are paralysed, the latter, by analogy, might be expected to show signs of atrophy.

The cumulative evidence for a spinal origin of lead paralysis is, I take it, almost irresistible, and then the precise localisation of the disease offers no difficulty. We know from observations of cervical pachymeningitis that the eighth cervical and first dorsal roots supply mainly the flexors of the fingers and small muscles of the hand; the fifth and sixth cervical roots have the distribution mentioned above—viz., the shoulder muscles and flexors of the arm. There remains only the seventh cervical; it is therefore in the anterior group of large cells giving origin to this root that we must look for the primary pathological changes, whatever they be, molar or molecular, of the typical saturnine wrist-drop. Whether our therapeutical resources will benefit by our increased theoretical knowledge of the disease remains to be seen. Hitherto, besides the orthodox administration of iodide of potassium, electrification of the affected muscles has been our sheet-anchor. A more localised, central application of the continuous current in *loco morbi*, combined with peripheral stimulation, might fairly be tried. But on this point I speak with all reserve, knowing how much the credit of electro-therapeutics has been impaired by the premature statements of narrow-minded enthusiasts.

CAUTIONS AND SAFEGUARDS ABOUT THE CLIMATE OF THE ENGADINE.

BY JOHN KENT SPENDER, M.D. LOND.

THE precept "go abroad" is much in fashion with doctors, and obedience to it is not less willingly yielded by patients. The medical injunction is reinforced by considerations of novelty, scenery, art, and æsthetics generally; pecuniary economy is quite out of the question now, for time and distance require a long and strong purse, and Continental prices often rival in grandeur those of the most favoured spots in Great Britain and Ireland. To youth and health the charm of foreign travel knows no abatement, nor are we so cynical as to wish it to be otherwise. But when the first bloom of health and youth is gone, and some of the weariness of riper age begins to be felt, new conditions are submitted to medical judgment, and nothing requires more careful forethought than advice about "change of air." A man who goes to Switzerland ought to take health in his hand, instead of searching for health when he is there. We confuse the respective benefits of mind and of body, and hastily infer that because a jaded mind is refreshed by Alpine wonders, a tired body is to be renovated by constant climbing, long excursions, and exposure to sudden thermometric and hygrometric changes. But if a body be diseased as well as tired, how much less capable is it of undergoing the discipline of the ordinary tourist, who is unhappy when not moving about, and who craves incessantly for new worlds and new skies!

I plead, therefore, that "change of air" is a desideratum not always best gratified by going abroad, and that for several reasons. 1. The fatigue of the journey many of the most popular Continental spas. 2. Excessive atmospheric heat, often alternating with violent thunderstorms

and unexpected chills. 3. The incessant noise and want of homely seclusion at most of the large foreign hotels, to say nothing of the absence of many domestic comforts prized by invalids. 4. Defective sanitation is still the great European blot, sometimes fouling the places which are most lavishly dowered with natural beauty. How serious it is that a person who travels in quest of health may not only fail in his mission, but may bring home a fresh and perhaps fatal disease.¹ The rule ought to be absolute that before a medical man advises a patient to go to a foreign health resort (whether inland or by the sea), he should go there himself first and be satisfied that it possesses the telluric and atmospheric qualities for which he recommends it. Second-hand knowledge on these matters has had very mischievous results; but whenever we are obliged (as must be sometimes the case) to consult the reports of others, the accounts given in local guide-books and the like must not always be trusted without some confirmation from disinterested sources. With these preliminary words I pass to the special subject of this short paper, which is to offer a few cautions about the climate of the Engadine, and to describe the conditions and limitations within which its salutary properties may be enjoyed.

The Engadine (Oeni-Gadina, Upper Valley of the Inn) has been so often described that I need say very little here on its geography. It is situated in the S.E. of Switzerland; it is about fifty-seven miles in length, seldom more than a mile in breadth, and runs from S.W. to N.E. Even at the upper end, the source of the Inn, it is a true valley, inasmuch as it is flanked by lofty mountains; but here it is no less than 5500 feet above the sea-level, and gradually slopes downwards with the course of the Inn to Martinsbruck, which is the boundary between Switzerland and Tyrol, and where the elevation is somewhat more than 3000 feet. From these data the climate can be easily inferred. It is as inclement as that of the north of Sweden or of Finland: the cultivation of corn is almost unknown, and tillage generally is very backward. The mean temperature of Pontresina for the whole year is only 34.7° (Fahr.); that of the three summer months (June, July, and August) is about 50°. The meteorological station is 6001 feet (1829 metres) above the sea. In summer the weather is never sultry, sometimes decidedly cold; the highest temperature ever recorded is 70.77°, but even 70° is rarely approached, and at dawn of day the mercury is sometimes nearly at freezing-point in July and August.² I do not speak of the meteorological curiosities of this region at other times of the year, because they do not practically concern British travellers.

The diminished pressure of the air is an important medical feature in the climate of the Upper Engadine. It is indicated by the physical phenomena of the mean height of the barometer being only 24.10 inches, and by water boiling at 202 degrees: hence the atmospheric pressure is fully one-fifth less than at the seaside. The air is proportionately rarefied, and being so constantly free from vapour, solar light and heat are much intensified. There is so little obstruction to the sun's rays that they beat down with uncommon fierceness on man and beast, and render a protection to the head always necessary in the middle of the day. I have never heard to what point the black-bulb thermometer would rise on exposure to the sun; but this I can testify, that there is a feeling of *stifling heat* in the air on clear days, owing to the heated condition of all terrestrial objects. And the difference of temperature between shade and sunshine is much greater than in the lowlands.

Now I wish to draw special attention to the two sources of danger which lie in ambush for delicate travellers whose main business is to recover health. (a) The first peril is the extreme range of temperature between day and night. Beneath unclouded skies radiation goes on without check or stint. Quite early in the afternoon Silvaplana is thrown into shade by the sun declining behind the mountainous slopes of the Julier; shade deepens into dusk, and dusk into night, and July is metamorphosed into October. A man who takes a stroll between 9 and 10 in the evening without a thick wrap over his shoulders is an adventurer who will probably pay his penalty, however rude his

¹ There is a fashion now in favour of roaming in Brittany, and in the last (June) number of the Magazine of Art there is an illustrated sketch of the archaeological attractions of Morlaix. Not a word of caution is written of the pestiferous qualities of that quaint old town, where there is enough fever and diarrhoea to satisfy the most enterprising pathologist, and as many stench as at St. Malo.

² I take these details from Dr. J. M. Ludwig's excellent handbook to Pontresina and its neighbourhood, fourth edition, 1879.

strength may be. How is the traveller to ventilate his bedroom at night? There is perhaps no fire-place, and if he open the casement but a crack the almost freezing air will enter the chamber, and with an inrush proportionate to the disparity of the external and internal temperature. The alternatives, therefore, are suffocation or chill. (b) The other danger is the great variation in the relative humidity of the air. In the morning and in the evening the humidity amounts now and then to 80 or 90 per cent.; early in the afternoon it may fall to 30, or even 25, per cent., and the atmosphere is said to be so dry during the winter months that meat may be preserved solely by its influence for several weeks at a time.

Now a simple comparison will show the advantage of the climate of the north of Sweden and Norway during the height of summer. If the sun has much less power by reason of its lower altitude, it shines continuously for a few weeks, and there is no night at all. So there are none of the fierce contrasts of more southern regions, where the brilliant sunshine of fifteen or sixteen hours is balanced by the rapid radiation during the hours of darkness. As a matter of poetry, and as favouring sleep, it may be desirable to have more night and less day; as a matter of physiological physics it is far better to have the solar influence distributed more evenly over the twenty-four hours, and for the body to endure less thermometric extremes.

During the nine days which I spent in the Engadine last summer (Aug. 12th to the 21st) the weather was variable. Five days were absolutely cloudless; two were showery; two were very rainy, with much lightning and thunder. The few days (Aug. 19th to the 22nd) which were so bad in England were very fine in most parts of Switzerland. A thunderstorm in the Engadine may come on suddenly; in a few minutes the temperature runs down fast, and the air feels damp and chilly, like Scotland or the south-west of Ireland. Dr. J. M. Ludwig's statistics are by no means favourable to the doctrine that the climate is (on the whole) a rainless one, as the number of days on which there is "more or less rain" from June to August (inclusive) is quite equal to what we have during an average summer at home. September is generally the least humid summer month. But the unexpected changes from fair to foul and foul to fair are very trying to an invalid. He may indeed guard against them by narrowly watching the barometer; but where is the convalescent who will systematically take so much trouble? Both at Pontresina and at St. Moritz there are plenty of "oracles" who can be wise after an event, and whose philosophy consists in telling certain people that they ought not to have come there at all. I do not wish to dwell on my own miseries, and how I was confined to bed for four days at St. Moritz by acute pyrexial lumbago and sciatica; but I feel entitled to warn rheumatic and gouty folk *not* to "try the Engadine."

From a health point of view, the difficulty of Switzerland is in its "ups and downs," the close heat of the valleys and the meteorological treachery of the "passes," where, at a height of only 6000 feet, deep snow in August is not very uncommon (as in 1876). But the point I wish to emphasise is that, however high above the sea a valley may be, *it is still a valley if shut in by mountains*, and therefore cannot have those health-giving properties which belong, for instance, to a Yorkshire moor or to the sea-level itself. An English or Scotch moor may seem to the artistic eye rather dreary, but Jean Ingelow's picturesque line—

"An empty sky, a world of heather"—

conveys the idea of *openness* and freedom from barriers which is truly refreshing. To be on tolerably high ground, with nothing to check a full sweep of the horizon, suggests all the winds of heaven blowing freely about, plenty of ozone, and a positive deliverance from organic poisons and contaminations. But here is the oddity of foreign ways, that the most frequented spas or systems of baths are down in hollow basins or caverns, hedged round by alps or steep fir-clad precipices. A traveller bound for the Engadine will probably stop at Ragatz, and wind his way by the side of the "impetuous Tamina" to the historic baths of Pfäfers, buried in the bottom of a dark gorge, where even the midsummer sun can shine for only a few hours in the middle of the day. The Tarasp Spa, in the Lower Engadine, approached by miles of the loveliest scenery, and a rendezvous of sick people from all parts of Europe, is situated on the level of the Inn itself; the direct solar heat is intense, and the grand enclosing mountains hinder the proper circulation of air. I might

enumerate several instances of a similar kind in Germany. What comparison, then, is there between these grilling places and our own breezy uplands and our glorious splashing seas?

I dispute not Dr. Ludwig's assertion, that the climate of the Engadine has some prime qualities, and that it may be greatly beneficial in some "nervous disorders consequent on severe illness or excessive exertion"; during recovery from some acute diseases; and as an antidote to certain grave constitutional conditions. But let it be remembered that we are dealing with a two-edged weapon, which may wound as well as heal. Exposure to storms, insufficient dress, and too long walks, are the snares which beset the invalid, and are more likely to entrap him here because the whole country is a paragon of beauty, and the air is nectar itself. To the wearied brain-worker who finds rest in the variety of outward objects and in the mere movement of travel, I say, Go to the Engadine and enjoy it to the full. But do not delay, as the valley is quickly losing its pristine innocence; and for noise and gaiety some quarters of it will soon rival Brighton and Scarborough. Nature, too, has not been entirely kind; for in 1878 the woods of the Upper Engadine were visited by a troublesome guest. A moth laid its eggs on the smallest twigs of the conifers; the caterpillars, when they came out, ate off the needles, so that the trees looked red instead of green. And the result of this devastation last summer was, that there had been a loss of thousands of larches and cembra pines.

Bath, June 9th, 1880.

FAT-EMBOLISM IN FRACTURES.

WITH NOTES OF A CASE.

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THE subject of fatty embolism in cases of fracture, though it has attracted considerable attention on the Continent, has not hitherto been much noticed in this country, and I therefore think that the particulars of a case in which this condition was found to be present after death may not be without interest to the readers of THE LANCET.

A man, aged forty years, was admitted into the Manchester Royal Infirmary about 11 A.M. on Feb. 27th, suffering from a severe compound comminuted fracture of the bones of both legs about their lower third, caused by a railway waggon passing over them. Amputation of both legs below the knee was performed antiseptically immediately after admission by Mr. Heath. The patient bore the operation very well, and was kept under the influence of opium afterwards. The evening temperature registered 101.2°. He passed a good night and expressed himself as feeling very comfortable the following morning. Temperature 103°; pulse 132; his general condition appearing altogether very satisfactory considering the severe injuries he had received. About 3 P.M., however, the same afternoon a sudden change was observed; he became very restless and excited, his countenance of a somewhat dusky hue, with increased frequency of the pulse and respiration; no rigors nor marked dyspnoea were observed; later on he became delirious and his condition was quite hopeless. At 9 P.M. the temperature was 105°, the pulse too quick and weak to be counted. There was slight discoloration of the integuments of the stumps discernible above the dressings, and a faint odour was perceptible, showing that putrefactive changes had been set up in spite of the antiseptic measures employed in the operation. At 10 P.M. death took place. (Strange to say, both the patient's arms had been amputated above the elbows about nine years previously for injuries of a similar character.) A post-mortem examination was made by Dr. Bradshaw, pathologist to the hospital, but no morbid changes of any importance were perceptible to the naked eye. As from the nature of the injuries it was thought not improbable that fatty embolism of the lungs might be