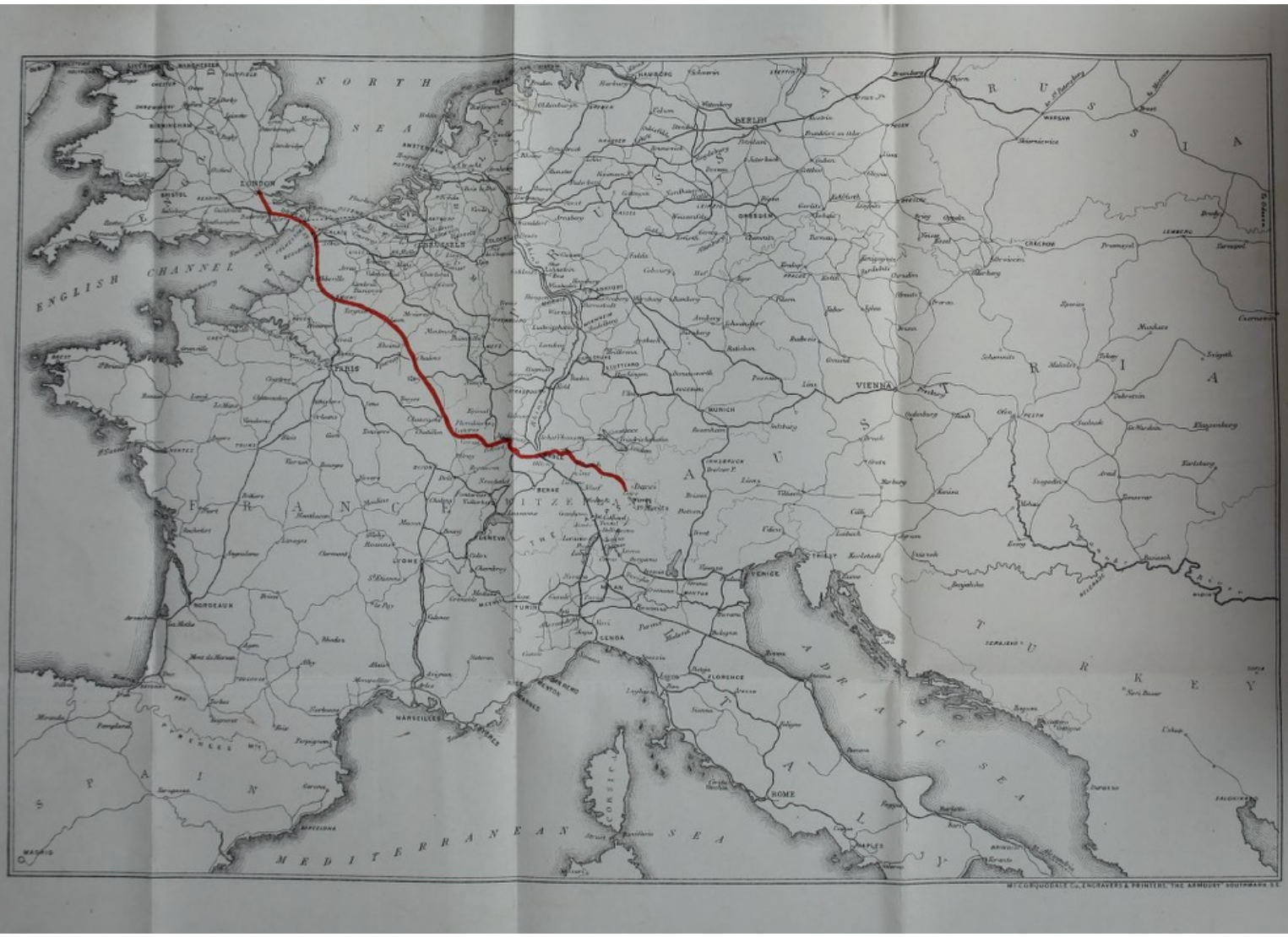
Wiesen as a health resort in early phthisis : with directions for clothing, diet, and exercise in the Swiss Alps during winter / by A.T. Tucker Wise.

ALPINE CLIMATE SERIES

WIESEN
AS A
HEALTH RESORT

WISE



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With the Author's compts

WIESEN

AS A

HEALTH RESORT IN EARLY PHTHISIS,

WITH

DIRECTIONS FOR CLOTHING, DIET, AND EXERCISE IN THE SWISS ALPS DURING WINTER.

BY

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BY THE SAME AUTHOR.

DAVOZ PLATZ,

AND THE

EFFECTS OF HIGH ALTITUDE ON PHTHISIS.

Fcap. 8vo.

"As far as we can see, Dr. Wise has collected all the information invalids need in a convenient form."—*Saturday Review.*

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PREFACE.

FROM the growing popularity of the treatment of early phthisis at high altitudes, observations on new winter stations may be of some interest, as the high valleys of Switzerland being all of limited extent, any undue crowding in particular localities must impair the purity of the atmosphere, especially as calmness of the air is one of the chief characteristics of Alpine climate. It must be noted, however, that the meteorological observations recorded of Wiesen were made during a winter unprecedented in rainfall for ten years. Disastrous floods occurred over the whole of Europe, and although the rainfall in the mountains did in no measure approach that of the lowlands, the westerly and south-westerly winds which prevailed, frequently raised the temperature and obscured the sun with clouds. Rain fell at Wiesen, Davos, St. Moritz, and Andermatt, in the month of January, an incident which had not taken place at that time of the year since 1875, therefore, although the description of winter sketched herein, must not be taken as a typical season at these altitudes, it will nevertheless

assist in forming a just appreciation of Alpine climate.

Wiesen can be reached *viâ* Dover, Calais, Brussels, Basel, Chûr (Coire)—Paris, Basel, Chûr—or Amiens, Laon, Delle, Basel, Chûr. The South Eastern Railway has a through service to Chûr during the autumn and winter months, so that by leaving Cannon Street, Charing Cross, or Victoria, at 10 a.m., the journey to Chûr can be accomplished in thirty hours, and from thence the next day to Wiesen by diligence (24 miles), or on to Davos (34 miles, if halting at Landquart, 24 miles). St. Moritz is also reached by this route; but as the diligence leaves Chûr at a very early hour in the morning it is advisable for invalids to break the journey at Thusis. Andermatt on the other hand, does not necessitate more than three-quarters of an hour by diligence, from Göschenen, the line to Göschenen leaving Basel *viâ* Olten, Lucern, &c. Those who suffer from sea-sickness would find the large tidal boats crossing from Folkestone to Boulogne more agreeable than the small boats which ply between Dover and Calais during the autumn and winter. When no stay is made at Boulogne, it will be found a convenience to have brought a lunch from London, as the fare sometimes provided at the Boulogne buffet is very bad, very dear, and must be eaten in a hurry. If crossing to Calais a good lunch can be obtained there. A stoppage is made at Tergnier for dinner, about 4 p.m.

The chapter on personal hygienic management is written for those who are not so ill as to require constant medical supervision, and who visit the mountains for the air, and not for physic. Should bad symptoms arise, they can always consult a doctor without paying the usual ten or twelve pounds for the "season," and swallowing numerous bottles of medicine in addition. For some curious reason this club system of medical fees is only now retained amongst some of the English community at Davos. All other nationalities pay their physicians the ordinary fees—viz., 2 to 5 f. a visit, 20 f. for the first complete physical examination of the chest, and 10 f. for every following examination.

Davos Platz, September, 1883.

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&c., &c.

INTRODUCTION.

THE first impression on beholding a snow-clad landscape in a cold climate during fine weather is one of surprise and admiration. Conscious of excessive cold by external appearances rather than by disagreeable sensations of chilliness, one almost doubts the reality of the low temperature. A bright sun and blue sky overhead, a clear and quiet atmosphere, distant sounds transmitted to the ear through the still air, combine with the charms of the scenery to produce such buoyancy of spirits that a man is braced and invigorated for almost any exertion.

An Englishman inured to a damp and windy climate, and with an inherent love for outdoor sports and exercise, feels new life and energy as he views the glassy expanse of a frozen Canadian lake surrounded by dense forest, or makes his way through the rugged boulders and pines of Nova Scotia. A blazing sun above would almost persuade him it was summer, whilst he recognises the sing-song of the sleigh-bells in the distance, miles away it may be, and tastes the keen atmosphere of a bright winter's day.

There may be several degrees of frost, but there is seldom that piercing, raw cold experienced in England, which depends mainly on the quantity of moisture in the

air and the force of the wind rather than on the pitch of the thermometer.

The effects on the Anglo-Saxon race of living in a cold climate may be seen in Canada and some of the Northern States of America, where the race is physically superior and more vigorous than that of the parent stock. This, no doubt, depends to a large extent on the mode of life, quality of food, and outdoor exercise taken, in addition to an artificial selection of species in emigration. Nevertheless, such is the fact that these cold climates, with wide ranges of temperatures, harden the European constitution by invigorating the whole frame, and rendering the body less susceptible to changes in temperature, privation, or disease.

What the eventual results will be on the English race by the growth of population and consequent increase of indoor employment, it is difficult to foretell. Certain it is that dwellers in large towns, *employées* in factories, workshops, warehouses, offices, &c., are not exposed to the most favourable conditions of life in regard to health and robust development; and although the "survival of the fittest" will select the strongest and most suitable being to withstand what may almost be termed the ravages of civilisation, even the selected one will scarcely be improved by the deteriorating effects of over-crowding, impure air, improper food, want of sun light and equable exercise of all the organs of the body.

With examples before us of the health-giving properties of cold regions, it may seem an oversight that cold climates as "change" never received the attention they merited until within recent years.

One of the first to foreshadow the track which is now being pursued by many of the leaders of medicine in England, France, and Germany was Dr. Bodington, a practi-

tioner in Warwickshire, who recommended "dry, frosty air" in the treatment of pulmonary consumption. In a small *brochure*, published by him forty-three years ago on this subject, he said: "To live in and breathe freely the open air, without being deterred by the wind or weather, is one important and essential remedy in arresting its progress—one about which there appears to have generally prevailed a groundless alarm lest the consumptive patient should take cold. . . . . The abode of the patient should be in an airy house in the country—if on an eminence, the better. The neighbourhood chosen should be dry and high; the soil generally of a light loam, a sandy, or gravelly bottom. The atmosphere is in such situations comparatively free from fogs and dampness. The patient ought never to be deterred by the state of the weather from exercise in the open air; if wet and rainy, a covered vehicle should be employed, with open windows. The cold is never too severe for the consumptive patient in this climate. The cooler the air which passes into the lungs, the greater will be the benefit the patient will derive. Sharp, frosty days in the winter season are most favourable. The application of cold, pure air to the interior surface of the lungs is the most powerful sedative that can be applied, and does more to promote the healing and closing of cavities and ulcers of the lungs than any other means that can be employed. . . . . Many persons are alarmed and deterred from taking much exercise in the open air from the circumstance of their coughing much on their first emerging from the warm room of a house, but this shows that the air of the room was too warm, not that the common atmosphere was too cold." As adjuncts, he advocated the use of milk, wine, and generous diet. (*a*)

(*a*) "Essay on the Treatment and Cure of Pulmonary Consumption." By George Bodington. 1840.

In these remarkable sentences are clearly signalised the indications for residence at such health resorts as the high Swiss Valleys, and they anticipate in an unmistakable manner the treatment of pulmonary disease or weakness by what is now termed, somewhat euphoniously, the "high altitude cure."

This English practitioner appears to have been the first, or among the first, to introduce to notice as a therapeutic agent "dry, frosty air," which has proved itself to be a remedy of practical value and application in the treatment of disease.

In more recent years Dr. Herman Weber, with eventual success, drew attention to high, cold altitudes as presenting favourable conditions during winter months for the arrest or amelioration of phthisis. To him undoubtedly belongs the credit of having brought the subject prominently before the profession in a clear and intelligible manner, with results on patients who had wintered in the mountains. For about six years Davos Platz has attracted large numbers of *poitrinaires*, and from reports published by English physicians at home the efficiency of mountain air in some cases of phthisis is undeniable. (*a*)

As may be expected, there are numerous sheltered spots in Switzerland where health may be sought with advantage, and where the benefits of living amongst a scanty population at a high altitude are associated with clean air and sunlight.

St. Moritz possesses the climatic characteristic of an Alpine health resort in having cold, dry, calm days, with plenty of sun. It is situated 1,000 feet higher than

(*a*) Dr. Clifford Allbutt, *Lancet*, 1879; Dr. C. Theodore Williams, International Medical Congress Transactions, 1881; Dr. Burney Yeo, "Health Resorts and their Uses;" Dr. Drysdale, *British Medical Journal*, 1882; Dr. Marcet, Symes Thompson, and others.

Davos, with grander and more picturesque scenery, and the principal hotel has the advantage of being placed about 300 feet above the floor of the valley. Although the past winter was exceptionally bad, as it was everywhere in Europe, the clear, bright, and invigorating days were quite similar to those of Davos, and delicate patients were enabled to sit out of doors in the sun without any danger of chill or sensation of cold. The results on patients who wintered there were pronounced by Dr. Holland to be eminently satisfactory, in spite of the adverse circumstances; whilst, on the other hand, the "cures" at Davos Platz were by no means so gratifying as during previous seasons. The Engadine was recommended some years ago as a winter station for chest complaints. Dr. Burney Yeo represented the advantages of its cold and dry climate, but at that period the high lands in Switzerland were not appreciated as they are now, and the experiment of sending patients there failed through a misunderstanding of the requirements of such cases. Now, however, the principal hotel offers every ordinary comfort to those who winter at St. Moritz. Two ice rinks are in constant use, and numerous tracks are kept in good order for tobogging. Another place which deserves special mention is Andermatt, situated in the Urseren Valley, and well sheltered from wind. It has the inestimable convenience of being only 28 hours from London, with a short drive of less than an hour on arriving at Göschenen. As this latter place is on the St. Gothard line, visitors can move on to the Riviera in a few hours if the mountain air is found unsuitable. A first-rate hotel—the Bellevue—is prepared to receive winter guests, and there is no doubt that this central and easily-approached locality will, when better known, prove attractive to

many who wish to spend a few months in the Alps during winter. In the near future, however, the Belgian project of building a Kurhaus, with mechanical arrangements for the propulsion of cleaned, moistened, and warmed air into the interior of the building, will undoubtedly meet with success in a sanitary point of view, and will be the first true attempt to construct an efficient system of ventilation in the "cure" establishments of the Swiss Alps, where people congregate with a view of breathing mountain air, but occasionally inhale the used-up air of the interior of a hotel, flavoured with carbolic acid.

Those who are unacquainted with high altitudes in winter may perhaps be inclined to judge the sensations at a high cold region from an English standard of cold, thinking possibly that twenty degrees of frost signifies twenty degrees of chilliness, and that any temperature below freezing point would be likely to cause discomfort to delicate persons. A brief explanation may tend to correct this view. The body can be deprived of its heat in four different ways :—

1. By conduction, or contact with colder substances, either solid, fluid, or gaseous.

2. By evaporation from the surface of the skin, and the mucous membrane of the respiratory tract.

3. By excretory matters leaving the body ; and

4. By radiation.

Now, although it is possible from the hygrometric state of the atmosphere that an additional quantity of moisture is evaporated from the skin and respiratory tract, at high levels, (*a*) this variation plays a very minor part in sensibly

(*a*) It must not be supposed that evaporation from the body depends entirely on the percentage of humidity in the air. The conservative and balancing agencies of physiological action amongst other things constringe or dilate the cutaneous capillaries in response to cold or heat, rest or exertion, &c.

reducing the temperature of the body compared to the abstraction of heat by conduction ; or, in other words, contact with cold air in movement. This latter cause is the one which principally bears on the question of sensation, inasmuch as cause No. 3 is too insignificant to be felt, and No. 4 can be guarded against to a great extent by clothing.

The physical sensibility of cold is produced by the amount of heat rather suddenly abstracted from the body (which does not always depend on the temperature in contact with it). For example, if the hand be placed on fur at 30° Fahr., it feels warm in comparison with iron at the same temperature. The former being a bad conductor—owing to the *motionless* air in its interstices—does not abstract much heat from the hand ; the metal, being a good conductor of heat, appears intensely cold to the touch.

If, therefore, cold, motionless, dry air surrounds the body, heat is not abstracted nearly so readily as it would be by somewhat warmer air in movement. It must be remembered that the sensation of cold cannot be accurately gauged by reference to the thermometer. Two other conditions are intimately connected with temperature in causing impressions of cold or heat—viz., wind and moisture, for it is these that cool the body, by conduction. If their temperature is lower than ours, they appear colder than they really are, because from their conductivity heat quickly passes away from us.

In the high valleys of the Alps, although the thermometer may register some 15° or 20° of frost, this low temperature is by no means disagreeable, as the calm air and intense solar heat enable many persons to sit in the open and bask in the sun during the depth of winter. Even

excessive tanning and reddening of the skin takes place with almost everyone who takes plenty of outdoor exercise: ladies, who are generally well protected by sunshades or umbrellas, do not escape a healthful aspect. This is mostly owing to the reflection of light from the snow, which, coming in upward and parallel directions, cannot be well screened from the face. The habit and necessity of wearing smoked-glass spectacles also enables persons to face the glare, and thereby receive a much larger proportion of light than in England. (*a*)

The physiological action of sunlight and other atmospheric conditions at high altitudes have been discussed in a former publication, (*b*) but a summary here may not be out of place.

The general conditions noted were as follows:—

1. Dryness of the atmosphere, and its comparative freedom from mechanical irritants, germs, and noxious gases (aseptic air).

2. Profusion of sunlight, with a low temperature.

3. Diminished barometric pressure.

The results on pulmonary complaints may be stated thus:—

1. Lessened irritation of the respiratory tract from absence of dust.

(*a*) It has been frequently noticed that dark-complexioned individuals become sunburnt more readily than "blondes." This depends principally on the sensitiveness of the retina and the colour of the eyes. For instance, "fair" people cannot face the light with such ease and comfort as those who have plenty of pigment in their ires; for the pigment absorbing the rays of light, protects the retina, and even enables some with very "dark" eyes to gaze on the sun itself. On the other hand, a person with a grey or pale iris averts or screens the eyes from the sunlight as much as possible, and in this way escapes the effect of the rays on the face.

(*b*) "Davos Platz, and the Effects of High Altitude on Phthisis." 1881.

2. Evaporation of morbid secretions in the lungs, promoted by reduced barometric pressure and dryness of the atmosphere.

3. Increased oxidation of blood and tissue, from sunlight, cold air, and reduced pressure.

4. Increased quantity of blood circulating in the lungs —caused by the low temperature—the freedom of the circulation being aided by extended chest movements.

5. Increased activity in the pulmonary lymphatics (depending on circulation and expansion), and a general improvement in nutrition ; also an exhilarating effect on the nervous system.

Some of these results are obtainable under no other conditions than those presented at high cold regions. With regard to the increased quantity of blood circulating in the lungs (presumably influencing the nutrition of those organs), it may be contended that this is not a desirable sequence. Perhaps it is not in hæmorrhagic phthisis ; but in some other forms, especially early tubercular deposits, it would not seem to be disadvantageous. What would lead one to suppose this is the rare occurrence of tubercular phthisis in persons affected with mitral disease. Even when hæmoptysis takes place, and when some of the blood presumably gravitates into the air cells, tubercular disease rarely follows ; whilst, on the other hand, phthisis is not an uncommon consequence after hæmoptysis from other causes. This would appear to indicate that a general hyperæmic condition of the lungs impedes the deposition of tubercle and restrains phthisical processes.

Conversely, where the quantity of blood circulating in the lungs is lessened, as in hot climates, phthisis is frequently seen to run a very rapid course.

It is not improbable that this increased volume of blood moving in an impaired and imperfect lung at a high altitude compensates to some extent for its loss in volume, and plays an important part in the nutrition of the tissues and in augmenting the movement of lymph through the pulmonary lymphatics, so removing by absorption many of the smaller morbid cell growths.

On the other hand, the emphysematous signs presented by patients who may be said to be cured, after a prolonged residence at high stations, may seem to contra-indicate any theory based on this assumption. It must be conceded, however, that with the expansion of the chest obtained, it is doubtful if emphysema occasions such compression of the pulmonary capillaries as to decrease the whole volume of blood circulating in the lungs.

That the lungs contain more blood in a cold climate is pretty clear, if we accept the evidence of Dr. Francis (Bengal Army), who found from a large number of observations that the lungs are lighter after death in Europeans in India than the European standard. Parkes confirms this, and also Rattray, in his observations of diminished respiratory function in hot climates.

When the activity of any organ of the body is augmented, more blood is attracted to it than when at rest or during lessened exertion. By breathing rarefied air at high levels the respiratory movements are usually quickened and extended, especially on taking exercise.

The liability, also, of the natives of these high valleys to pneumonia, while exempt from phthisis, would seem to point to some alteration in the vascular condition of the organs affected.

What result any variation in the vascularity of the

lungs would have on the bacillus tuberculosis is rather premature to surmise. No bacilli have, however, up to the present time been discovered in the blood of tubercular subjects. It appears, therefore, that either they do not enter the vessels, or, if entering, are changed in character or destroyed. That the state of the blood, chemical or pathological condition, or functional activity of the tissues must be agencies governing the suitability of the soil for the reception of the bacillus is supported by the fact that infection is very rare, although there are numberless cases in which bacilli have undoubtedly been inhaled.

It is well known, also, that the hygrometric and barometric states of the atmosphere modify the process of evaporation from the lungs (*a*) and skin. The evaporation of morbid secretions in the lungs was pointed out in 1881 (*b*) as being one of the conditions which probably has a favourable bearing on phthisis. The process of evaporation in dry climates, acting on ulcers, cavities, or suppurating surfaces, may illustrate by a natural phenomenon the "dry treatment of wounds," so successfully carried out by Mr. Gamgee, of Birmingham.

(*a*) In a publication on "Davos: its Local, Physical, and Medical Aspects," edited by W. H. Vorman, 1882, the calculation was attempted to be made of the increased weight of fluid exhaled from the lungs in the Alpine climate. 66156·7248 minims were computed to leave the lungs every twenty-four hours. This, although in the right direction, is a most unfortunate and misleading estimation. As the statement has been translated into English, it may not be immaterial to note that such a quantity could not be excreted without an equivalent weight of fluid being taken internally.

Briefly, therefore, a healthy man would in this instance excrete—

From the lungs	137·826 oz.	in 24 hours.
Average evaporation from the skin	24·466	,,
Renal excretion (in a cold climate)	60·	,,
	222·292 oz.	

The effects on the body of sunlight and reduced pressure are doubtless those facilitating the interchange of gases in the blood and tissues, whilst the cold air necessitates the requirement of a larger expenditure of oxygen and assimilation of hydro-carbons to maintain the heat of the body. It may be conjectured that this contributes to the sudden and considerable push given to nutrition on arrival at a cold high altitude, when the appetite is, in most cases, at once improved in a remarkable way, and animal food that could hardly be thought of in England without disgust is eaten promptly. Where improvement begins it is difficult to say ; indeed, it is only to a combination of causes that the variety of effects can be attributed. This push to nutrition is a reliable feature in the first evidences of progression, and assures a certain amount of hopefulness in the case.

The exhilarating feeling produced by the *consciousness* of moving about amid snow and ice, without taking cold or feeling pinched, is not to be despised as contributing towards cure. The contrast of this with the life of a consumptive in England during winter, where every change of weather has to be guarded against, is so marked that the hope of recovery presents itself, and despondency is banished.

There is every reason to suppose that under the many favourable circumstances presented by these climates the treatment of suitable cases of consumption and affections

He would therefore require to take about 11 pints of fluid during the day and night to meet the loss, and if the skin (which generally excretes 1½ times as much as the lungs) maintained its relative activity a person would have to consume about 20 pints in the 24 hours. Valentine, however, calculates that the fluid exhaled from the lungs ranges from 6 to 27 ounces, the ordinary quantity being 9 or 10 oz.

(*b*) "Davos Platz, and the Effects of High Altitude on Phthisis."

of the chest can be undertaken with greater confidence, and those measures which have of late years prolonged many valuable lives in England are certainly most likely to be efficient and successful when supported by the curative effects of mountain air.

[Taken as read at the meeting of the British Medical Association, Liverpool, 1883.]

CHAPTER II.

Site and Elevation of Wiesen. Its Neighbourhood. (5,050 *ft. above sea-level by the Calculations of the Swiss Meteorological Society;* 4,990 *ft. by Dr. Frankland; and* 4,771 *ft. from Dufour's trigonometrical measurements.*)

THIS small village stands about twenty-four miles from Chûr (Coire), on the picturesque Landwasser route. About 11 miles further on, after presenting several structural difficulties and passing through the Züge gorge, the road winds into Davos.

The position of Wiesen exhibits many peculiarities and advantages as an Alpine health resort in winter. Situated on the slope of the Wiesener Alp, facing south and protected on the N. and E. by mountain ranges of 8,000 ft. and 10,000 ft. (Sandhubel, Foppa, Alteingrat, Leidbachhorn), it is effectually screened from the cold winds of winter. Sheltered equally on the southern and western aspect by the Buhlenhorn and huge Stulsergrat (8,390 ft.), the Tinzenhorn (10,278 ft.), and Piz St. Michel (10,374 ft.), and continuing the circle, by the Motta Palusa, Piz Toisa and Piz Curver (9,760 ft.), a land-locked region is formed, radiant in winter with dazzling sunbeams. A thousand feet below is the Landwasser chafing

through a narrow course to join the Albula, a mile or so beyond.

Covering the slopes are innumerable pine trees. The odour from these is frequently perceived by new comers, and the antiseptic vapours exhaled presumably contribute to cure.

The most noteworthy feature of the vicinity is an extensive plateau partially filling up the N.W. side of the basin, and jutting out towards the centre, forming an excellent and picturesque promenade. The view from the border of this plateau is seldom excelled on a small scale. Far down at one's feet is seen the floor of the gorge, with the rushing of the Landwasser audible. A peep at the Albula Valley is gained, and beyond rises the Curvèr.

On the left lies the little village of Jenisberg; the Stulsergrat towering above. Behind to the east is the Alteingrat, Leidbachhorn, &c., and on the right the two hotels separated from the plateau by a small vale down which the road descends to the Züge, passing the Känzeli Waterfall.

A variety of attractive walks can be had in the neighbourhood. Limiting enumeration to a few within a short distance, the descent to the Jenisberg Brücke far exceeds all others in beauty. After repeated windings through a larch-wood a view is obtained of an undulating ravine densely overspread with dark green firs stretching away to the Albula Valley. The sound of the Landwasser becomes more distinct through the trees, and a few turns bring one abruptly on to the bridge.

The bridge itself is built of pine, and has the sides and roof of the same material. It spans the chasm without any central support, and some rough engineering skill is

evident in its construction. The spectator avails himself of a small hole, cut on either side, permitting a sight of the yawning abyss beneath. To project the head and peer down at the Landwasser is most fascinating, and well worth the half-hour spent in making the journey. After leaving the bridge a few turns to the right will afford a fine front view of the Bärentritt. In this direction the return trip can be prolonged through the pines towards Ziegelhütte, returning to Wiesen by the Landwasser Road, occupying about one hour and a quarter.

Another walk which deserves special mention is to the Grosser Wasserfall. Passing through the village of Wiesen, distant about 200 yards from the hotels, and hidden from view by its position, the road makes several turns, and crossing one or two mountain torrents, reaches an open pasture. Traversing this and entering the forest, the waterfall is discovered in a secluded glade, affording a pretty glimpse at the peak of the Tinzenhorn.

The most frequented ramble, and one that has but a slight incline, is the Landwasser Road in Chûr direction, proceeding as far as the Tiefentobel. A commanding view is obtained of the Piz d'Aela (10,894 ft.) and the other lofty peaks on the south side of the valley. After passing over a stone bridge a tunnel cut through the rock is entered, and the road can be continued to Schmitten, about 2 miles.

By the same road in the opposite direction, towards Davos, the Känzeli Waterfall is an attraction. A small gallery jutting out from the roadway has been constructed here as a point of view from which the pedestrian can see the torrent on the right, losing itself amongst the pines of a wild and rugged ravine. A continuation of the walk takes one on to the wonderful Züge gorge.

The Wiesener Alp can be ascended by passing through the village and taking a turn to the left, a directing-post indicating the way. The ascent is easily made at any time except immediately after a heavy snowfall. The pathway is good, and leads into the pine-woods. From a little eminence a pleasant view is obtained of the valley and surrounding mountains.

Other excursions might be named which could be undertaken on foot or by sleigh. In the western division of the village are two hotels, each of which can accommodate from thirty to forty persons. Up to the present time mostly summer guests have frequented the place, but arrangements are now made to receive those whose health compels them to reside at a high altitude during the winter season. The proprietors furnish good *cuisines*, and the quality of food compares very favourably with that at Davos, whilst the cost of living is less.

CHAPTER III.

The Climate of Wiesen.

MATERIAL assistance in describing this will be rendered by a contrast with Davos Platz.

No one has at any time seriously made the attempt to uphold Davos as faultless ; nevertheless, in the present instance it will serve a very convenient purpose to recognise in the well-known Alpine station a suitable standard for comparison.

To disarm criticism, as far as observed facts are con-

cerned, nothing has been designedly omitted which would appear prejudicial to Wiesen. The drawbacks, as well as the advantages, are shown, to enable a correct judgment to be formed of the place and the class of cases it is likely to suit.

Distant 11 miles from Davos, 334 ft. lower in altitude, and with a different contour of land, slight modifications in the meteorological details may be anticipated ; whilst the general character of a cold, bracing, and stimulating climate is maintained. The chief points of variation from Davos are—its position on the side of a hill ; sparser population ; slightly higher and more equable temperature, with less wind. Wiesen may be considered to be about 2 or 3 degrees warmer than Davos, and, although an increase of mean temperature might lead to the belief that dangers would arise from thaws recurring, the periods of liability to actual snow melting seldom take place with more frequency than in the latter valley. The intense heat of the sun sometimes renders parts of the main road damp under-foot when the snow is discoloured, but this could be greatly remedied by removing or covering all dirty patches as soon as formed. The plan of cleaning the roads in this manner is adopted at Davos, and would, no doubt, be undertaken at Wiesen if the number of visitors increased.

With a higher mean temperature, of course the winter is shorter compared with Davos : this might be two or three weeks at the commencement of cold weather, and about the same at the termination of the winter. During the worst time of snow-melting in Davos (which happens either in March or April, according to the mildness or severity of the season), Wiesen clears of snow rapidly ; and there being no flat and marshy valley below, like at Davos when the snow melts, any injurious consequences proceed-

ing from dampness and evaporation from marshy land are avoided. The hard frosts at night during this period depend much on terrestrial radiation and gravitation of cold air : the larger sky expanse presented to the Davos Valley favours the former, whilst the situation of the village is low. The bad part of the winter season is then much prolonged, as the warmth of mid-day and afternoon causes a thaw. The evening and night change the wet snow into ice, and so delay its speedy disappearance. An early clearance of snow makes Wiesen a desirable locality for a change from Davos towards the end of the season. Or by judiciously-timed transits from one place to the other much of the bad weather can be escaped at either station in the months of October and March. The journey can be made within two hours, and if a tolerably fine day be selected, little risk is incurred, even in an open sleigh. Covered sleighs may be chosen ; but with plenty of wraps, in bright weather an open vehicle is much to be preferred. Neither would it be at all a perilous test if the experiment were made of sending cases here when Davos was found to be unsuitable for them. If satisfactory progress were not induced, the patient would be spared the long drive to Chûr or Lanquart. The deplorable results which have taken place after sending people who were seriously ill from Davos on to Thusis and Ragatz n cold weather perhaps supports this suggestion. On the other hand, the advisability of making a rapid descent from a high altitude to the low-lands, even for convalescents is questionable. Many patients, when leaving Davos for the plains, lose much of the ground they have gained, in consequence, it may be, of the fatigues of travelling, exposure to windy or damp weather, neglect of ordinary precautions or care in personal management. Dr. Spengler, of Davos

Platz, makes a statement which not only suggests the need of investigation into this matter, but also raises doubts as to whether the "high altitude cure" can be considered a permanent cure or not ; in other words, if the advantages gained by breathing this mountain air are lasting, and if persons can return to their old occupations with impunity :

"Un médecin, residant à Davos, a observé, durant une pratique de treize ans, non seulement que l'état sanitaire et les rapports de la mortalité sont des plus favorables parmi les habitants de cette vallée, mais encore que les cas de phthisie pulmonaire, en particulier, y sont complètement inconnus ou tout ou moins extrêmement isolés. Par contre, il a vu des natifs de Davos, tels que pâtissiers, cafetiers, etc., qui, après avoir échangé le séjour de leur vallée contre celui de grandes villes de l'Europe, sont revenus à Davos avec tous les symptômes de la phthisie pulmonaire. Mais lorsqu'ils eurent aspiré pendant quelque temps l'air natal, leur santé s'améliora et finit par se rétablir complètement. L'arrivée de plusieurs malades suivit de près la publicité de ces constatations, et si le succès qui a couronné leur séjour à Davos n'a pas été aussi rapide que pour les natifs mêmes de la vallée, il n'en a été ni moins heureux, ni moins complet." (*a*)

It would appear from these observations that a prolonged existence in Davos does not carry with it immunity from phthisis, even in presumably healthy persons with little or no hereditary predisposition to the disease. How much more, then, must "cured" patients be liable to a return of pulmonary symptoms?—when are these likely to re-develope themselves?—when does the expanded chest shrink again? These are questions which will be answered, no doubt, by increased experience of Alpine climate.

(*a*) "Le paysage de Davos."

CHAPTER IV.

Water Supply and Soil.

THE water supply of the hotels appears to be of wholesome and excellent quality, it falls on the extensive surface of the Sandhubel, mostly as snow, and is filtered through the broad summit of the Wiesener Alp, where it makes its appearance in the wood by numerous springs. The springs selected to supply the houses are protected from cattle, &c., and the water brought down in pine-tree tubes to a tank on the hill, and from thence in iron pipes to the hotels; where in winter it is constantly running to prevent the pipes freezing. The likelihood of contamination is then at a minimum, as no storage takes place in the houses, nor are there any habitations above the level or in the vicinity of the mountain streams.

The water itself is without odour or flavour, and has a bright sparkling appearance from the carbonic acid taken up in the interstices of the rocky soil, through which the springs percolate. Although deprived of its oxygen in winter, by freezing when falling as snow, it becomes sufficiently aërated in its course from the springs to the tank.

It is probable that nearly all the springs at these altitudes in the neighbourhood of Davos closely resemble each other in their chemical constituents, therefore a reference to an analysis made by Mr. Philip Holland, of water found in the Davos valley will give some idea of the character of that at Wiesen.

"The general composition of the water shows the saline

matter to consist chiefly of the carbonates of lime and magnesia with some sulphate of lime. They failed to yield either 'free' or 'albumenoid' ammonia when examined by the method of Messrs. Wanklyn and Chapman, nor were nitrates found. The chlorides, too, are in very small amount. They cannot therefore, presumably, have received sewage matter. The water used by the inhabitants is collected from small streams rising in the adjacent mountain sides, and is conducted to their doors from the higher to the lower level by iron pipes, and in some places, for the greater distance, by primitive wooden conduits common throughout Switzerland.

"The total solids yielded on evaporation varied from nine to eleven grains per imperial gallon. The following is an analysis of the water used for the table at the Hotel Belvedere. It flows from an iron pipe fixed in the wall on the mainroad, and close to the hotel :—

	Grains per Imperial Gallon.
Carbonate of Lime	4·964
Carbonate of Magnesia	4·506
Sulphate of Lime	0·931
Silica with Oxide of Iron	0·232
Chlorine (calculated as chloride of sodium) ...	0·232
	10·815

Solids by evaporation, 11·10

"The somewhat considerable proportion of magnesium carbonate will be derived from the Dolomite limestone, which is plentiful in places along the valley.

"The other samples of water taken from other sources in the valley, have yielded results so nearly similar to the one mentioned that we have not deemed it necessary to

insert the tables here, and the general inference to be drawn is that all the water in the valley is exceptionally pure." (*a*)

The condition and nature of the soil at these high level stations, presents an interesting subject of study, but one which it is impossible to deal with, at any length, in the limits of the present work. One or two of the salient features connected with the temperature, and quality of the land, must not however, be passed over.

The soil of these mountain pastures is thin, of a rich, fertile character, and absorbs roughly 1·4 (*b*) times its weight of water, underneath is the solid rock, mostly Dolomite limestone, except in the centre and at the edges of the valleys or ravines, where lie the moraines of ancient glaciers composed of rubbish or deep earth intermixed with smooth blocks of rock and pebbles.

From the steep declivities on which moisture falls no injurious collection of water can take place. The drainage both of the surface and subsoil is rapid and effective. Being also of shallow depth, the danger arising from a heavy rainfall pressing up effluvia from the deeper strata, is obviated; and having also no stagnant underground sheet of water, the evolution of organic emanations, forwarded by constant moisture, is not aided; or if these decompositions do occur, it is probable that absorption of their deleterious properties, is mainly affected by contact with comparatively dry earth. Vegetation also, as short thick grass covering the slopes, speedily absorbs the

(*a*) Davos Platz as an "Alpine Winter Station," for Consumptive Patients. By J. E. Muddock, with Analytical Notes on the Food, Air, Water, and Climate. By Philip Holland, F.C.S.

(*b*) 2 Kilos 500 grms. of soil taken from garden and dried, weighed 1 Kilo, 850 grms. on being wetted again and allowed to drain, weighed 2 Kilos, 600 grms.

products of decomposition. But the condition of the land with which we are principally concerned during the winter season, takes on altogether a changed aspect, and one which until recently has attracted little attention. Uninterruptedly covered with snow for about four months during the year, the ground itself assumes the nature of "sub-soil," whilst the layer of thick snow above the actual service, modifies in a marked degree the effects of telluric influence.

Occasional falls of snow assist to free the atmosphere also, from aërial germs and mechanical irritants, fixing them in a freezing medium; the former being destroyed or absorbed by the soil and vegetation, at the time of thaw; the latter being washed into, and mixed with the earth. Under these circumstances it is apparent that the air above is as pure as nature can possibly produce it—clean, dry, calm, and laden with balsamic vapours from the pines.

The system of drainage, for a scantily populated locality, is safe enough. Cesspools are placed on the sloping land at some distance from the hotels. The form of water-closets, however, is bad, as in most Swiss hotels. Promises are made that these defects will be remedied, and that for the forthcoming winter a skating rink will be constructed with other improvements, if the number of visitors admits of the outlay.

CHAPTER V.

Winter Clothing.

THE selection of suitable clothing for an Alpine climate will contribute greatly to health as well as to comfort.

The first advice tendered to ladies who seek restoration to health from lung disease is :—Abandon corsets absolutely, and wear the loosest cincture on the waist. This injunction cannot be emphasised too strongly. One prominent sign of what may be termed "cure" of phthisis, at high altitudes, is the almost invariable expansion of the hole or portions of the chest walls. To impede such a eneficial result is to limit the advantages of breathing mountain air. No one could wittingly be guilty of such an irrational procedure as to curtail the actual physical improvement they travel many miles to secure. Yet usually whilst the upper regions of the chest are allowed free play, the most mobile section, the diaphragm, is fettered and confined in its movements by an unyielding investment pressing on the abdominal viscera. In this way an opposite conformation is maintained against what physiology and common sense would indicate ; for in many instances where damage exists in the superior thoracic regions, limitation of movement is desirable in *these* situations, rather than in the lower and sounder parts of the lung.

The substitute for corsets should be a thick flannel waistcoat or jersey. Flannel should also be worn next the skin over the trunk and extremities. Chamois leather may be substituted when over-sensitiveness of the skin

renders the use of flannel unbearable ; generally, however, a fine texture can be procured which is not too irritating. A good stock should be taken as frequent changes are beneficial.

The coverings for the feet and legs require attention. In all cases woollen socks or stockings are indispensable. Flannel pants should be made long enough for socks to be drawn over them. By enveloping the whole body in flannel the patient is spared the necessity of loading the exterior with thick weighty dresses or heavy overcoats, which fatigue the wearer and confine the act of respiration. Those who are liable to suffer from cold feet or are susceptible to chilblains will find thick worsted socks and cloth gaiters a necessity. As a prophylactic against chilblains, bathing the feet in salt and water, avoiding tight boots, and changing the socks whenever the feet are damp from perspiration, &c., will carry many through the winter of a cold climate, who might otherwise suffer much inconvenience and pain from these minor but troublesome ailments. Boots should not be over thick and heavy, which renders them inelastic. There is no utility in having clump soles, as leather gets saturated quickly with moisture and takes a long time to become thoroughly dry. Ordinary stout skating boots with broad toes, low heels, and plenty of room inside them, which may be filled up with a cork sock, are suitable both for ladies and gentlemen ; they should be well greased every day and always changed immediately after a long walk. Goloshes are useful for short journeys, but cannot be recommended for constant use on account of confining the perspiration. All clothes should be light in colour, as near grey as the taste will allow. A light colour does not absorb nor radiate heat so much as black, therefore a wearer of grey will be com-

fortably free from the heat of solar radiation and warmer in the shade. Waistcoats should be lined in the back with flannel, as with modern garments all the protection is in front of the body. (*a*) If men endeavoured to dispense with the use of braces greater play would be given to the muscles of inspiration. Hats may be of straw for the sunny weather, but light-coloured thin felt answers very well. Furs should not be worn when taking exercise. The ladies' fur tippet can be discarded as dangerous at any time, from the fact of its covering the shoulders only, causing that part of the body to become overheated, and therefore liable to chill. A short list is appended of articles found to be serviceable for these climates :—

One fur or railway rug. One warm ulster with hood or fur-lined coat for travelling or sleighing. One thin overcoat, a Shetland shawl. Two suits of clothes (waistcoats lined). Thick flannel vests and flannel shirts. Flannel night-shirts. Half-a-dozen or more worsted socks. Flannel pants. Cloth or fur gloves with gauntlets. Cork socks. A pair of dark neutral tint spectacles. A few rough bath towels and a flesh glove. One woollen muffler. Two pairs of stout boots (one pair smooth for skating, the other with a few spikes in the soles, not thickly studded with nails, or the snow will ball on them). A pair of leggings are required for "coasting" unless long boots are taken. One pair of shoes or thick slippers with heels, can be worn indoors with spats over them. Bootlaces, dubbin, and skates may be added, and for ladies, a sunshade and goloshes with or without cloth tops. A fur foot-warmer or large fur-lined boots are also very useful.

(*a*) With double-breasted apparel a man may have from ten to thirteen thicknesses of woollen clothing in front of him, whilst his back is covered with three layers of wool only.

CHAPTER VI.

Diet in the Swiss Alps.

THE food at St. Moritz, Davos, and Wiesen, as almost every where in Swiss hotels, consists largely of azotized or nitrogenous matter. Many who have visited Davos, for example, will recollect that much lean meat is eaten, whilst the proportion of animal fats is very small.

It is essential to the health and well-being of individuals that a proper proportion of nitrogenous and non-nitrogenous food should be consumed. The latter consists chiefly of starch, fats, sugar, saline substances, and water, which in the ordinary way with meats, form the mixed dietary most suitable for man; as the structure of his teeth and past experience indicate. But whilst an almost exact estimate can be formed of the elements necessary for the system to ingest, it must not be forgotten that the quantity and kind of food taken will depend very much on the condition or idiosyncrasy of the consumer. As a general rule, few delicate persons would be capable of effectually digesting the quantity of bread, pastry, milk, and root vegetables, &c., which would be requisite to constitute with the meat eaten, a fair combination of nitrogenous and non-nitrogenous matter, and as there is a marked absence of palatable fat at these places, a little consideration of the means for balancing the needful combination, will conduce to the recovery of health and avert many ill-effects arising from perverted nutrition—as dyspepsia, troubled sleep, a loaded tongue, vitiated secretions, &c.

"Many people," Dr. Pavy remarks, "seem to look upon meat almost as though it formed the only food that really nourished and supplied what is wanted for work. The physician is constantly coming across an expression of this view."

The greatest importance must be attached to the use of fats during winter in the Alps; for it is well-known that the inhabitants of Siberia, Greenland, &c., and all cold countries, eat enormous quantities of these heat-producing materials, without which they would be unable to resist the intense cold of their frigid climate. Sir John Ross observes—"It would be very desirable, indeed, if the men could acquire the taste for Greenland food, since all experience has shown that the large use of oil and fat meats is the true secret of life in these frozen countries."

Dr. Cheadle also lays much stress on the value of fats in cold climates. "One effect of the cold was to give a most ravenous appetite for fat. It is the most valuable part of food in winter, and horses and dogs will not stand work in the cold unless fat." (*a*)

Besides forming the chief articles of diet which are required for a calorifacient or heat-producing agent, they may almost certainly supply a pabulum for the oxidising process of fever in phthisis, to act upon, thereby, not only restricting the waste of tissue in that process, but perhaps in some way diverting its occurrence, as is witnessed when cod-liver oil is taken. With an increase in animal food, which can be readily eaten at high cold levels, the appetite being sharpened by exercise and low temperature, the necessity for fats is by no means abated, on the contrary, a physiological demand is created for additional food

(*a*) "The North West Passage By Land." Viscount Milton and Dr. Cheadle.

capable of undergoing the process of oxidation, which cannot be wholly supplied by the lean meat or by starchy and saccharine bodies.

"It appears from the experiments of Pettenkofer and Voit that increasing the proportion of nitrogenous matter in the food determines an increased absorption of oxygen by the lungs. Nitrogenous matter it is which starts the changes occurring in the system, and the suggestion presents itself that upon the amount of nitrogenous matter may, to some extent, depend the application of oxygen to the oxidation of fatty matter. Under this view the success of Mr. Banting's system may be due, not exclusively to the restriction of the principles that tend to produce fat, but in part, also, to an increased oxidizing action promoted by the large amount of nitrogenous matter consumed." (Pavy).

Let us draw attention to the substances at these health resorts that furnish the calorifacient group of alimentary principles. Disregarding the fat produced by a complicated metamorphosis of the carbo-hydrates and a small part of the nitrogenous food ingested, (*a*) the main articles of diet from which fat is derived, would be butter and milk. About 1 oz. of the former at breakfast, and 2 pints of milk during the twenty-four hours together furnish at the most 2·6 ozs. of fat, allowing from ½ oz. to 1 oz. for that contained in the lean meat with gravies, &c. 3 to 3½ ozs. are obtained. It is doubtful if this is sufficient with exercise and low temperature, nor is it to be recommended that those with poor appetites should drink

(*a*) It is questionable, if with the low temperature in the Alps, phthisical persons should be physiologically compelled to maintain much of the body-heat by the carbo-hydrates, as the changes in their principles previous to their becoming calorifacient take place in the liver; and the function of that organ is often impaired in phthisis.

more milk. Persons should eat plentifully of butter at breakfast, especially as that meal is not a substantial one.

It would also be very advantageous to continue taking cod-liver oil if it had been found to agree in England, for reasons that are plainly apparent. Should the stomach have been unable to digest it hitherto, trial should again be made iu a cold climate, as it might be then more easily assimilated, its oxidation being assisted by the increased proportion of nitrogenous material ingested. A good time for taking it is immediately after lunch or dinner in a glass of marsala, or in milk half an hour after a meal, commencing with one tea-spoonful, and gradually increasing the dose.

Pancreatine and pancreatic emulsion are sometimes valuable in assisting the digestion, and malt extracts also. All these substances can be looked upon as supplementary to diet, and not as medicines. If cod-liver oil is objectionable, butter should be eaten at every meal, or cream be made use of.

To further demonstrate the virtue in cod-liver oil, fat, and butter, the table on next page taken from Frankland will give a clear idea of their force-producing value.

In the event of high temperature supervening, the digestion of meats is greatly interfered with, and the usual diet stands in need of modification, as the nitrogenous matter will, if excessive, embarrass the digestive powers, and prove an encumbrance to the stomach, leading to further complications, which may be avoided by substituting food of a different nature that has not to undergo such a complicated process of absorption and elimination. For this purpose, milk and raw eggs are to be chiefly relied on, with beef-tea, soups, jellies, light puddings, toast, biscuits, and farinaceous substances, as

Name of Food.	Per cent of water present.	Force-producing value.		
		In units of heat.	In kilogrammétres of Force.	
			When burnt in oxygen.	When oxidised in the body.
Cod-liver oil		9107	3857	3857
Beef fat		9069	3841	3841
Butter		7264	3077	3077
Cocoa-nibs		6873	2911	2902
Cheese (Cheshire)	24	4647	1969	1846
Isinglass		4520	1914	1550
Bread-crust		4459	1888	——
Oatmeal		4004	1696	1665
Flour		3936	1669	1627
Pea-meal		3936	1667	1598
Arrowroot		3912	1657	1657
Ground rice		3813	1615	1591
Yolk of egg...	47·0	3423	1449	1400
Lump sugar		3348	1418	1418
Grape sugar (commercial)...		3277	1388	1388
Hard-boiled egg	62·3	2383	1009	966
Bread-crumb	44·0	2231	945	910
Ham, lean (boiled)... ...	54·4	1980	839	711
Mackerel	70·5	1789	758	683
Beef (lean)	70·5	1567	664	604
Veal (lean)	70·9	1314	556	496
Guinness's stout	88·4	1076	455	455
Potatoes	73·0	1013	429	422
Whiting	80·0	904	383	335
Bass's ale (alcohol reckoned)	88·4	775	328	328
White of egg	86·3	671	284	244
Milk...	87·0	662	280	266
Apples	82·0	660	280	273
Carrots	86·0	527	223	220
Cabbage	88·5	434	184	178

arrowroot, or one of the numerous "foods." By this regimen, bearing in mind that the system requires much less nourishment when the body is at rest, an ample dietary is furnished. During bad weather, also, when but little exercise can be undertaken, and confinement indoors is called for, diminished diet proves of some service, not only to the comfort of the patient, but to his

general condition, and, consequently, the local state of disease.

On the cold, dry days, with outdoor exercise, the appetite can be wholly satisfied, with safety and advantage, for it is on these occasions that the "push" is given to nutrition, and any excess in nourishment is more likely to be burnt up or assimilated in the system, to maintain heat, produce force, or counterbalance waste and change.

As the breakfast is not a substantial meal, it will be perceived that the latter part of the day, between noon and 8 p.m., is the period principally occupied by the digestive process, the remaining sixteen hours, therefore, will, in the case of delicate persons, prove to be a great tax on the force and heat-producing powers unless sustained in some way or other. Although it is impossible to lay down rules to apply to every one, a short dietary table for an ordinary case of loss of flesh can be modified to suit the temperament or capacity of any individual, bearing in mind that in many instances "suitable diet" is a matter of experiment.

Regimen at the Swiss Health Resorts.

7 or 7.30 a.m.—Warm milk, ½ litre.

8 or 8.30 a.m.—Breakfast: Tea, coffee, or chocolate, ½ litre; bread, butter, honey. Extras not provided *en pension*. Eggs, cold meat, bacon, omelette, &c.

Noon or 1 p.m.—Lunch: Soup, meats, sweets, cheese, 2 glasses of red wine, or wine and water (½ pint).

4 or 4.30 p.m.—Warm milk, ½ pint, with a biscuit, or other light refreshment, as tea, coffee, with bread and butter.

5.30 or 6 p.m.—Dinner: Soup, fish, or *entrées*, meats, sweets, cheese, red wine or wine and water (½ litre).

9 p.m.—Supper not provided *en pension*. Milk, ½ pint, with biscuit, &c., or beef-tea, or some "food" prepared with milk.

A glass of milk, with a biscuit, may also be taken sometimes at 11 a.m. if it is found to agree.

If night-sweats occur, nourishment should be taken at frequent intervals, especially during the night. Stimulants are efficacious at these times—whisky, rum, or cognac; but spirits should always be mixed with milk or egg, or both combined. Their efficiency seems to be increased in this way. Neat spirits as a "*petit verre*" cannot be recommended with much benefit unless there is food in the stomach. Brand's extract of meat, and Liebig's, are suitable also. These can be mixed together, when they form a better and more natural beef-tea than when taken separately. The Veltliner wine drunk with meals will act as a good astringent. A frequent cause of perspiration at night is an excessive quantity of clothes on the bed. The usual eiderdown quilt should not cover the patient if night-sweats are frequent. A flannel night-shirt is of great service on these occasions, and the temperature of the bedroom ought never to rise over fifty degrees. Fifty to fifty-five degrees is generally found to be a comfortable temperature in winter.

CHAPTER VII.

Exercise, Meals, Sleep, &c.

It is unnecessary to point out the need for individual management in this matter. Much will depend on the state of health and capability for exertion. One rule can

however, be laid down—viz., keep in the open air as much as possible. This will of itself entail a fair amount of movement, but if the state of the lungs do not preclude skating, tobogganing, or walking ascents—care must, of course, be taken in beginning exercise gradually. A state of breathlessness or fatigue must never be permitted, nor must the body be allowed to cool rapidly if perspiring.

The time available at these altitudes in the depth of winter is somewhat limited for delicate persons, as the sun at this time of the year remains but a short time in the valleys (five to six hours). It is therefore incumbent on those seeking health to make the most of this time, and when in-doors to breathe as much fresh air as can be admitted with comfort. Bedroom windows can be left a little open if the nights are clear, and the heat of the stoves regulated accordingly. In giving an outline of personal hygienic management a description of how the day may be passed will be of some assistance.

At 6.30 or 7 a.m. the stove should be lighted, and a half-litre of milk, warm from the cow, be brought to the bedside of the patient. After drinking this, an hour's sleep may be had. If a cold bath be prohibited, a rapid sponging of the chest and back, followed by friction, is of great service in keeping the skin in a healthy condition. A fairly vigorous patient may have a cold bath, or the chill may be taken off; but precaution must be observed in having the air of the bedroom at this time fresh and warm (not below 55 degs. F.), so that the deep inspirations caused by the shock of cold to the skin shall not take in the used-up bedroom air. A bath or sponging may be tolerated in many cases, provided it takes place *immediately on rising*, while the body is hot. If the skin be allowed to cool down by tardiness in preparing for the

bath the water will feel intensely cold. Slight dumb-bell movements may be executed when dressed, throwing the shoulders back and taking deep inspirations. Soon after breakfast, which is taken at 8.30 or 9 a.m., the patient should get out for a walk, making a slight ascent if not too short of breath; and returning at 11 a.m. for a glass of warm milk. The afternoons are mostly spent in sitting out of doors, skating, coasting, walking, or sleighing—the latter is not to be recommended in very cold weather. Another half-pint of milk can be drunk in the afternoon, or a little light refreshment such as tea or coffee will do no harm, the patient being generally able to determine if it can be taken with benefit. If he finds it too much fluid, a less quantity of thin cream might be substituted. Symes Thompson gives a short piece of advice free from mysticism on the subject of exercise in the Alps (*a*) :—"Those in health need few restraints, but for those with active lung disease sudden exertion on arrival should be discouraged lest it lead to hæmorrhage. If there is active disease or hæmorrhagic tendency or moist sound in the lung, the patient should sit out in the sun till dry sounds replace moist ones. He may then walk on the level, or skate, or gently stroll up and down hill, thus causing deep inspiration. Quiet skating can be indulged in by almost all. 'Tobogganing' is more severe, as patients are apt to talk and laugh when walking up hill. This is very good for the vigorous, as it expands the chest. Lawn tennis is suited only for the strongest, in whom lung disease is quiescent."

The dinner hour varies in different hotels. At St. Moritz 7 p.m., Davos and Wiesen from 5 to 7 o'clock.

(*a*) "On the Winter Health Resorts of the Alps." E. Syme Thompson, M.D.

Food should be taken leisurely, and masticated well. Half an hour's rest before and after meals facilitates digestion. The evenings are spent in various ways. Davos possesses a theatre and concert-room (*b*) and amateur theatricals are got up at the hotels, with concerts, tableaux vivants, &c. It would be a great boon if, on the occasions of such gatherings, artificial means were provided for the purification of contaminated air. With the intense external cold, air cannot be plentifully admitted to dilute the effete products of respiration, &c., therefore, although entertainments in crowded rooms generally conduce to a healthy frame of mind, and tend to banish despondency, evils may originate if sanitary precautions are neglected.

With respect to the length of time for sleep, the temperament and habits of the individual will have to be considered. The old dictum of 6 hours for a man, and 7 hours for a woman will scarcely commend itself to most people, nor does experience teach us that any definite duration of time for mental and physical rest can be determined with exactitude. The intensity of muscular, mental, or nervous exhaustion during the day will in all cases influence the desire for repose. Cold also predisposes to sleep, as may be witnessed in hybernating animals. Some human beings also hybernate. It will not be too much to say that 8 or 9 hours slumber in winter, at these cold stations, is near the mark ; remembering that nothing is to be gained by remaining in bed in a semi-state of wakefulness after this time is past.

If smoking cannot be entirely given up, the quantity of tobacco used should be cut down as low as possible.

(*b*) This handsome salon at the Kurhaus is very well ventilated by a calorifère.

Cigarette smoking should certainly be discontinued by those whose lungs are affected, as the habit generally acquired of inhaling the smoke or passing it through the nasal passages, proves very irritating to the mucous membrane, and is more injurious to the throat and lungs than the same portion of tobacco smoked in a pipe.

CHAPTER VIII.

The Drawbacks to High Altitude Stations.

THE great drawback to these health resorts, as with many others in the South, is defective sanitation. As long as overcrowding does not take place, the cold and snow will, to a great extent, mitigate the evils of bad drainage and impure emanations ; but when hotels get filled with a large number of visitors, many of whom may be in delicate health, the air within will not (except by artificial ventilation and good drainage) be free from the usual indoor impurities, as exhalations from the lungs and skin of organic matter, scales of epithelium, fibres of cotton, wool, wood, &c.; the products of combustion from gas, lamps, and candles ; bacteria and fungi ; and, what is, perhaps, more important still in the case of delicate lungs, the bacillus tuberculosis floating about in the air. Patients must therefore exercise their own discretion in opening windows and airing their rooms as much as possible. A fair quantity of fresh air can always be permitted to enter the bedrooms, according to the desire of the individual ; but in dining-rooms, billiard, smoking, and conversation rooms

the means of admitting pure air and providing for the escape of foul are very imperfect. Until appliances are introduced into the hotels to clean the air, warm, moisten, and medicate it if necessary, the high altitude stations can scarcely be designated "air-cure places," for most of the patient's time is spent indoors, where the conditions in some of the hotels are no better than at home—perhaps worse, if the house should be full of people.

The stoves also require looking after—firstly, to see that servants do not entirely close the valve which regulates the flue; and, secondly, to have a vessel containing water in the room to supply the air with moisture. The hand-basin half filled will answer the purpose very well.

The Föhn wind and changes in the weather cause a certain amount of annoyance and dissatisfaction, for it is not always calm and bright, and there is rather a dearth of amusements, Davos Platz excepted, which has a theatre and concert-room, bands, &c., and quite enough gaiety for invalids. It is almost essential that some special employment should be undertaken: languages can be studied, or the mind occupied with work of some sort. By this means time does not drag heavily, *ennui* is not experienced, and restoration to health is not retarded by dejection of spirits.

The travelling also has to be considered. Those who are in pretty fair health can make the journey in three days, either to St. Moritz, Davos, or Wiesen, and twenty-nine hours to Andermatt, but a longer time is recommended for those whose health does not admit of prolonged confinement in railway carriages. The journey may be broken at Paris or Brussels, Bâle, and Chûr.

On arrival there is very often a difficulty in sleeping for the first few nights, depending on the sudden rise to high regions. This can be met by remaining a few days at

Chûr (1,936 ft.). The stay there will frequently help in training the system to the new conditions. It must not be forgotten that the altered form of bed may, in many instances, prevent sound and refreshing sleep. The wedge-shaped hair bolster can sometimes be removed with great advantage to the sleeper, and extra clothing be placed over the shoulders and upper part of the body, which is usually not covered by the eider-down quilt.

Great discomfort is frequently caused by chilblains during the winter time. To prevent these, walking exercise should be taken immediately after breakfast, and the endeavour be made to keep the feet warm throughout the day by this means. The parquet floors, although healthy and advantageous in many respects, are, in a great measure, the cause of cold feet and the source of chilblains.

What has been advanced as an objection to Alpine stations is the use of the German stove as a means of warming the interior of houses and hotels. The fault, however, does not lie so much with the ponderous German *Ofen* as with improper management in neglecting to provide sufficient ventilation for the rooms and moisture for the air. An improvement on these stoves are the steam reservoirs in use at the Kurhaus, Davos Platz, the admission of steam being under the control of the occupant of the room in which they are placed. This plan also raises the temperature without raising the "dew point," or, in popular language, "dries the air," creating a necessity for a small supply of watery vapour to render the atmosphere fit for healthy and agreeable respiration; for although dryness of the climate is one of the main features of the Swiss Alps, a limit can be reached beyond which a dessicating effect may be produced, and it is probable that

many of the disagreeable issues attributed to the Föhn wind are brought about by a rather sudden increase of temperature within doors, accompanied by too low a percentage of relative humidity. Unless attention is at once directed to the warming arrangements, feelings of *malaise*, thirst, cough, dryness of nasal passages, and possibly hæmorrhages may be caused.

The introduction to the bright and calm winters of these regions is sometimes wet, raw, and unsettled. Many who venture to leave England before obtaining intelligence of the state of the weather to be found at the place they intend to visit will incur some risk if they make a hurried journey from fair weather to cold and wet. Acclimatisation has frequently been held up as a pre-requisite for visitors, but, as the winter is generally bright, calm, with dry cold and plenty of sun, the risk of arrival, even after the commencement of winter, is certainly not greater than during the autumnal raw cold, alternating with falls of snow, and wind. To become acclimatised for the best season of the year, and the one which is regarded as the "cure" period, requires no inurement during the worst season. The selection of an Alpine station should certainly be influenced by the opinion of physicians at home, even where the intention is entertained of returning for a second or third winter. Perhaps this may seem to be written in the interests of the medical profession, but those who have spent three or four seasons at Davos will have observed that some cases return again who would do better in a southern clime. An over-estimation of their own recuperative powers, or an enthusiastic belief in the potency of the charming Alpine climate to sweep away all maladies, is possibly the cause of an injudicious decision.

Children over three years of age do extremely well in

the Alps, make healthy blood and muscle, gain flesh, and expand their chests. Under this age, it is doutbful if sufficient exercise can be taken by a child to ward off the cold, without being swathed to such an extent in furs and flannels as would impede the free motion of the limbs and thorax, so essential to development in childhood.

It is also a moot question whether some invalids should not quit the Alps immediately the end of the winter seems approaching, as the changeable weather, with wet roads, winds, &c., is likely to upset many of the benefits gained during the dry season. In this case, it would probably be well to go south, Lugano (982 ft.), Como (705 ft.), Nervi, Sorrento, &c.; but if spring has set in, the shores of Lac Léman (1,230 ft.) offer a fairly safe change. Thusis (2,448 ft.), Ragatz (1,709 ft.), Mels (1,637 ft.) are near; Soglio (3,569 ft.), in Val Bregaglia, situated on the slope, is spoken well of by Dr. Holland as a halting-place. A month might be spent at any of these, previous to returning home, provided the weather is fine, but it is well to be impressed with the necessity of the great personal care needed during this migratory period, especially with regard to clothing. Thick flannels, socks, &c., should not be dispensed with hastily, and it would be well to guard against the change from the calm regions by adopting outer garments of close texture, impervious to the chilling effects of wind.

In conclusion, it may not be superfluous to remind those interested, that the high cold regions are not yet proved to be the best for all early disease. The varieties of chest affections and the individual differences of affected persons denote that one general climatic panacea is quite inadmissible, and what may be a suitable climate for one case may prove of very little value to another. Whilst some

misconception prevails on these points, cold mountain air will not receive the appreciation it merits. It would be inconsistent to contend that any particular health resort had not its drawbacks, but in spite of much misunderstanding and opposition, high altitude treatment is gaining ground with the medical profession, and will, no doubt, some day take its right place in climatic therapeutics. Time is needed for the subject to be well threshed out by advocates and opponents alike.

WEATHER JOURNAL OF WIESEN,

WITH

Notes of Davos, St. Moritz, and Andermatt,

taken by different observers.

Wiesen.

1st November, 1882.—The sun rose over the Stulsergrat at 8.34 a.m., and at 10 o'clock the black bulb *in vacuo* marked 107°·8 Fahr. This solar radiation increased till noon, when 118° was noted. At 1 p.m., 117° ; 3 p.m., 115°. The sun disappeared behind the Curvèr at 4 p.m., without any valley-wind springing up, and the air remained calm throughout the subsequent variation in temperature.

2nd.—Sun-rise was slightly cloudy. At 10 a.m. there was bright sunshine, which lasted until 4 p.m., and clear blue sky overhead.

3rd.—Calm, bright day, with blue sky. 25cc. of water in a tumbler of a diameter of 6-5c. ; lost 1cc. by evaporation in two hours.

4th.—Fine day.

5th.— Do.

6th.— Do.

7th.—During the past week no cold has been felt. Gentle exercise, or sitting in the sun, was sufficient to produce a sensation of warmth and comfort. If much exercise were taken, the evaporation from the skin was so rapid that no uneasiness was caused by perspiration either on the body underneath flannel, or on exposed parts, such as the palms of the hands, face or neck. A walk of twelve miles produced no fatigue in a healthy man. The roads were dry, and the small quantity of dust lay undisturbed by wind. The temperature in unheated bed-rooms facing north and west varied from 48° Fahr. to 52° Fahr., but rose higher when windows were open to admit the sun-air.

8th.—The morning broke with clouds and westerly wind overhead, but calm in the valley. After noon the sky became overcast, and dark clouds gathered away to the southward and westward.

9th.—Slight rain fell at 9 a.m., but rapid evaporation kept the roads and balconies comparatively dry. During this day, although rain fell, the psychrometer never at any time indicated saturation.

10th.—Snow fell, and at intervals fogs filled the valley. Occasional sunshine and appearance of blue sky.

11th.—A westerly current was perceptible overhead, bringing with it clouds which sometimes obscured the sun. Snow, which had fallen during the previous night, disappeared by evaporation towards noon. Moderately fine day.

12th.—Bright and cloudless day.

13th.—Overcast with bright glare. Exercise could be had from 9 a.m. to 4 p.m. Roads slightly damp in places.

	Davos.	St. Moritz.	Andermatt.	
...	Cloudless.	... ...	...	...
..	Cloudless.	... ...	...	. .
...	Bright and fine.	... ...	.	...
...	Fine.	...	...	...
...	Do.	...	.	...
...	Fine; a little wind.	...	...	...
...	Do	... ...	...	...
...	Cloudy, with wind.	... ...	...	...
..	Cloudy, wind, rain.	.. ...	...	...
...	Snow.	... ...	...	..
.	Cloudy, calm.	... ...	...	...
...	Fine.	... ...	..	...
...	Cloudy.	... ..	...	...

November.

14th.—At 3 p.m. a south-west wind (Föhn) was blowing overhead, and the sky was half covered with clouds, with but little sunshine. Puffs of thalwind in the afternoon. Moderately fine day.

15th.—At 8 a.m. a fog filled the valley. At 9 o'clock snow fell, and the fog lifted. Bad day.

16th.—Calm and bright up to 3 p.m., when clouds gathered, and at 4 p.m. snow fell.

17th.—Sky covered with packs of roll-cumulus. Moderately fine day.

18th.—The shade temperature at 10 a.m. was 21° Fahr.; and although the sun's rays were weak and occasionally obscured by passing clouds, the air did not feel cold to the nasal passages, nor was extra clothing needed for out-door exercise. Fine day.

19th.—At 8 a.m., although the sun had not risen, the low temperature (15°·2 Fahr.) did not feel painful nor disagreeable. A cold bath could be taken without the steaming and chilliness experienced in England during cold weather. Moderately fine day.

20th.—Snow fell occasionally.

21st.—Fine weather up to 4 p.m., when the sky became cloudy and overcast.

22nd.— Do. Do.

23rd.—At 11 a.m. a mist filled the valley for about twenty minutes. In the afternoon the temperature rose to 39°, producing a slight thaw. Fine day.

24th.—Cloudy morning. Thalwind at 9.30 a.m. for half-an-hour; blew in gusts from eastern end of valley. Force, 1 to 3, Beaufort scale. Fine day.

25th.—The sun rose at 9.54 a.m., and in one hour the solar radiation marked 114° Fahr., with a shade temperature of 30°. The snow was evaporating, but without dampness being apparent. Fine day.

26th.—Gusts of valley wind at 11 a.m., lasting fourteen or fifteen minutes. The roads kept dry, although the snow was thawing on the housetops. Fine day.

27th.—Snow fell until 1 p.m. Clouds occasionally filled the valley. Overhead a northerly current was plainly discernible, whilst the lower current was from the south-west, the moisture of which, being condensed by the temperature of the land below and the northerly wind above, fell as snow. Moderately fine after 1 p.m.

Davos.	St. Moritz.	Andermatt.
... Bright early, rain, slight wind.	... ..	... ...
... Snow.	... ...	... ...
... Cloudy, intervals of sunshine.	... ...	... ...
... Snow, slight wind.	... ...	... ..
... Snow, slight wind.	... ...	Blue sky, with passing clouds; a little snow.
.. Snow, calm air.	... ...	Snow.
... Snow, calm air.	... ..	Cloudy, a little snow.
.. Fine morning, afternoon dull, with cold wind.	... ...	Snowing; blue sky, with clouds.
... Moderately fine morning, afternoon dull; snow.	... ...	Do.
... Dull; thawing; snow and rain.	... ..	A few clouds.
... Dull; snow; clear latterly.	... ...	Blue sky, with clouds; slight wind.
... Fine morning; afternoon dull, thaw.	... ...	Clear; Föhn.
... Fine morning; afternoon dull and mild; thaw.	... .	Föhn; rain.
... Dull, with snow; afternoon fine.	... ...	North wind, snow; afternoon calm, with clouds.

WIESEN.

November and December.

28th.—Morning cloudy and overcast. At 1 p.m. patches of cirro-cumulus appeared on a blue sky, and the day continued fine.

29th.—From 9 a.m, to 10.30 the valley was enveloped in mist, and the air became saturated with moisture at a temperature of 20°. About 11 a.m. the sky cleared, and the day continued fine.

30th.—Overcast till 10 a.m. The rest of the day fine.

During this month westerly winds prevailed over a large area of Europe, and they were felt here for an unusually lengthened period. The month as a whole was a bad specimen of the general November weather of these altitudes, even taking into consideration that the winter change occurs during this period. In the German papers it was stated that more rain had fallen in the latter part of the month than had been noted for a like time during the present century.

1st December.—Fine snow fell, off and on, during the day. Dull and cloudy.

2nd.—Owing to absolute calmness, the atmosphere, although saturated with moisture, did not feel intensely cold until wind sprung up. The hands suffered in handling thermometers, &c., but on deep inspiration the sensation of cold air was not perceived beyond the nostrils. The temperature at this time was 15° Fahr. Snow fell in minute flakes nearly all day. Bad day.

3rd.—At 8 a.m. the temperature was 5° Fahr., but did not feel so cold as yesterday afternoon. A morning bath produced no chilliness, although the water was taken direct from the tap, and no extra clothing was felt to be necessary. Fine morning. Dull afternoon, but suitable for walking.

4th.—Cloudy morning. Slight thaw on housetops during the afternoon. Moderately fine day.

5th.—At 9 a.m a gusty west wind lasted for half-an-hour, and blew the snow like clouds of dust from the roofs of houses. Afternoon overcast. Snow fell. Bad day.

6th.—Calm and bright day throughout. Ozone, 19, with nine hours exposure.

7th.—Overcast until 11.30. Fine after.

8th.—Foggy until 10 a.m. Calm and bright for the rest of the day.

9th.—Moderately fine.

10th.—Snowing all day. Foggy, and no sun. Unsuitable weather for out-door exercise.

11th.—A mist filled the valley all day. Calm atmosphere, but no sunshine.

DAVOS.	ST. MORITZ.	ANDERMATT.
Dull, snow, wind; fine afternoon.	...	Snow.
Fine.	... ...	Clear; afternoon, clouds.
Moderately fine.	... ...	Clear.
Dull; snow; very cold; wind afternoon.	Fine morning; dull afternoon.	... ...
Dull; very cold wind; a little snow.	Blue sky, with passing clouds; very cold wind.	... ...
Cloudy.	Cloudless; cold.	... ...
Dull; mild; thaw.	Cloudy; warm; windy.	.. ...
Dull, hail, wind, snow.	Cloudy; mild; S. wind.	... ...
Sunny; cold wind after 11.30 a.m.	Calm, cloudless.	... ...
Dull until 11.30 a.m. Fine after.	Overcast, mild, snow; fine afternoon.	... ...
Moderately fine; no wind.	Blue sky, with passing clouds.	... ...
Dull.	Cloudy morning; fine, then snow.	... ..
Snow; dull; cloudy.	Snowing all day; 2ft. 9in. fell.	... ..
Cloudy; thaw; raw and damp.	Overcast, mild.	.. ...

WIESEN.

December.

12th.—Fine day up to 2 p.m. Cloudy after.

13th.—Wind in a south-westerly direction overhead, with occasional clouds obscuring the sun. Exercise could be taken till sunset. Lights were required at 4.40 p.m.

14th.—Moderately fine.

15th.—Fine day, with the exception of a slight thaw.

16th.—Thaw continued, but the air remained calm and dry. Bright sunshine.

17th.—Fine day.

18th.— Do.

19th.— Do.

20th.—During this and the four preceding days the weather was unusually warm for this period of the year. Although the comparatively high temperature produced a slight thaw, the atmosphere never became damp, and the sun shone with great power.

21st.—Fine day.

22nd.— Do.

23rd.—Snow fell. Wind from S.W. Bad day.

24th.— Do.

25th.—Cloudy.

26th.—Mist in the lower part of valley, about 300ft. below the level of the houses. It travelled upwards towards noon, enveloping the village. Rain fell.

27th.—Raining at 8 a.m., and foggy at 11. (Rain at this time of the year had not been known for eight years. Over the whole of Europe floods and extreme wet abounded.)

28th.—Overcast until 11 a.m., when the sun appeared and remained up to 3.45 p.m. Thawing. Moderately fine day.

29th.—Fine day. Snow thawing on roofs of houses.

30th.— Do. Do.

31st.— Do. Do.

1st January.—Rain. Westerly currents of air prevailed in Switzerland; much snow-melting took place, and many snow avalanches fell. Disastrous floods in Germany and Austria. Cold wet winds on Riviera.

DAVOS.	ST. MORITZ.	ANDERMATT.
Sunny morning; dull afternoon.	Calm in morning; then snow and wind.	
Fine morning; dull afternoon; thaw.	Cloudy; mild; snow.	
Mild, dull, thawing.	Cloudy; south wind; snow; thaw.	
Sunny, warm, and damp.	Cloudy; thaw.	Slight wind; a few clouds.
Fine morning; duil afternoon.	Blue sky, with passing clouds; thaw.	Cloudy; slight wind.
Cloudless.	Cloudless.	Clear.
Very fine.	Cloudy, mild, fine.	Cloudy.
Cloudless.	Cloudless.	Clear.
Cloudless.	Do.	Do.
Very fine; a few clouds.	Blue sky; slight clouds.	Clear.
Bright; clouds; cold wind.	Cloudless.	Snow; afternoon, few clouds.
Snow; wind.	Snow; N. wind.	Do.
Snow, very windy.	Cloudy; a little snow.	Snow; a little wind.
Dull; snow.	Cloudy; snow in afternoon.	Do.
Damp; sleet; bright afternoon.	Blue sky, with passing clouds; S. breezes; warm.	Rain.
Rain all day.	Overcast; thawing; rain.	Rain.
Dull; thaw; clearer in afternoon.	Blue sky, with passing clouds; warm; finer in afternoon.	Clear.
Cloudless.	Cloudless.	Clear.
Cloudless.	Do.	Clear.
Dull; faint sun; mild; thaw.	Overcast; mild.	Blue sky, with a few clouds; rain fell.
Rain and thaw.	Overcast; mild; slight rain.	Rain; few clouds.

WIESEN.

January.

2nd.—Cloudy, rained towards evening. ...

3rd.—A mist swept through the valley for a few minutes in the forenoon, sun shone out after, most of the day cloudy. ...

4th.—Calm and bright day.

5th.—Slight valley wind at 10 a.m., and again at 4 p.m. Fine day. ...

6th.—Fine day. ...

7th.— Do. ..

8th.— Do. ...

9th.—Fine day, slight valley wind at 9 a.m ...

10th.—Sky overcast with bright glare, slight valley wind at 9 a.m., and again at 4 p.m. Moderately fine day. ...

11th.—Sky overcast with bright glare until noon, when a smart south-west wind blew in gusts until evening, eating away the snow with great rapidity. There was no dripping from the roofs owing to the rapid evaporation. Roads wet in places. ...

12th.—The S.W. wind blew in gusts all day, no rain or snow fell, sun very powerful. ...

13th.—Stormy day, dry atmosphere. ...

14th.—Bright day with hot sun, snow melting. ...

15th.—A little cloudy but fine. ...

16th.—Snow fell. Foggy. ...

17th.— Do. Do. ...

18th.—Bright and calm. ...

19th.— Do. ...

20th.— Do. ...

21st.—Bright and calm, slight valley wind occasionally. ..

22nd.—Bright and calm, valley wind in the afternoon. ...

23rd.—Moderately fine, windy afternoon. ...

Davos.	St. Moritz.	Andermatt.
Dull, mild, thaw.	Overcast, mild W. breezes.	Rain, few clouds.
Cloudy, wind.	Overcast, a little colder.	Misty morning.
Cloudless, thal-wind.	Lovely day.	Clear.
Cloudless.	Do.	Do.
Cloudless.	Lovely day, breezes later.	Do.
Bright, cold wind.	Slight cloud, cold.	Do.
Bright, cloudy in afternoon.	Overcast, cold.	Clear, after noon a few clouds.
Fine.	Blue sky, cold wind.	A few clouds and a little wind.
Dull and mild, a little wind in afternoon.	Cloudy, slight snow.	Cloudy, with a little wind.
Dull and mild, not much sun-shine.	South wind, snow falling all day, warmer.	Do.
Cloudy, cold wind, warm afternoon.	South wind, snow in morning, finer afternoon.	Do.
Dull, warm, high wind.	Snow all day, slight thaw.	Snow, wind S.W.
Fine, thaw.	Blue sky, with passing clouds.	Blue sky, with cloud.
Fine.	Overcast, mild.	Do.
Very dull, clouds low.	Snow, mist, thaw.	Snow.
Dull, clouds low.	Fair day, overcast.	Blue sky, with cloud.
Cloudless, a little wind, misty.	Fine.	Clear.
Cloudless, thal-wind.	Do.	Do.
Cloudless, over-cast in after-noon.	Do.	Do.
Cloudless.	Do.	Do.
Cloudy at 1.30., wind.	Blue sky, N. wind, Fine.	Clear, evening, fog and wind.
Fine, N.E. wind, cold.	Blue sky, very cold, N. breezes.	Cloudy.

WIESEN.

January and February.

24th.—Gusts of wind after 1 p.m. Moderately fine. ...

25th.— Do. Do. ...
26th.— Do. Do. ...

27th.—Moderately fine, gusts of wind in the afternoon. ...

28th—Snowing slightly at intervals during the day, with gusts of wind, exercise could be taken between whiles. ..

29th.—Very warm sunny day, calm, dry atmosphere, snow melting rapidly. ...

30th.—Cloudy, wind sprung up at 10 a.m. from the eastern end of valley, the sun made its appearance at this time and the sky cleared. Roads wet from rapid thaw. ...

31st.—Snow had fallen during the previous night. Clouds rolled up from the westward and filled the valley until 11 a.m. when sunshine appeared. Roads in good condition. Fine after 11 a.m. ...

1st Feb.—Moderately fine day. ...

2nd.—Fine and bright. ...

3rd.— Do. ..

4th.—Snowing. ...

5th.—Fine and bright. ...
6th.— Do. ...
7th.— Do. ...

8th.—Cloudy morning, after noon the sky became clear and the sun strong. ...

9th.—Snow disappearing rapidly on banks and exposed places by evaporation, roads wet, cloudy afternoon. Moderate day. ...

10th.—Faultless day, with exception of rapid thaw. ...

11th.—Morning moderately fine, afternoon overcast. Sleet fell at 3 p.m., changing to snow as temperature fell. ...

12th.—The sun was very hot all day, air dry and still, sky almost cloudless, faultless day, with the exception of thaw. ...

	Davos.	St. Moritz.	Andermatt.
.	Fine, N.E. wind, cold.	N. wind, very cold.	N. wind, clouds.
.	Fine, slight wind.	Slight cloud.	Clouds.
	Dull, snow, fine afternoon.	Cloudy, light breezes, snow.	Snow, S.W. wind.
.	Snow, wind, fine afternoon.	Light breezes, snow.	Snow.
..	Snow, high wind, a little sun in afternoon.	N. wind, a little snow, cold.	Snow, N. wind.
..	Dull and warm, fine afternoon.	South wind, bad day.	Clear.
..	Fine, cold.	Blue sky, with passing clouds, S.wind, finer in afternoon.	Fine morning, few clouds.
..	Dull, slight wind.	Snow falling all day, S. wind.	Cloudy, S. W wind.
..	Dull and cloudy.	Overcast, fine, felt warm.	Cloudy, S. W. wind.
..	Cloudless, slight wind.	Fine, S. breezes.	Clear.
..	Dull and cold.	Overcast, moderate day, S. breezes.	Cloudy.
..	Dull, snow, high wind.	South wind, snow.	Do.
...	Cloudless.	Fine.	Clear.
..	Do.	Fine, felt warm.	Do.
...	Do.	Blue sky, with passing clouds.	Do.
...	Do.	Light breezes, finer in afternoon.	Almost clear.
...	Snow.	South wind, moderate day.	Do.
...	Fine, S. wind.	South wind, moderate day.	Clear, föhn wind.
...	Snow.	South wind, snow.	Cloudy, snow S.W. wind.
...	Fine, N. wind	Passing clouds, light breezes, and snow showers.	Almost clear.

WIESEN.

February

13th.—A little cloudy. ...

14th.—Foggy until noon, clear towards evening. ...

15th.—Overcast with bright glare until 10 a.m., after that the sun became very powerful, melting the snow rapidly, the air became dry. ...

16th.—Snowing all day, foggy, calm, damp. ...

17th.—Cloudy and foggy. ...

18th.—Fine day. ...

19th.—Snowing most of the day. ...

20th.—Misty morning, but clear towards afternoon. ...

21st.—Fine day. ...

22nd.— Do. ...

23rd.—Misty in the morning, cleared at 11 a.m., snow melting, and strong wind sprung up at 1.30 p.m. from north-easterly direction, blowing in gusts, two currents perceptible overhead, N. and S., violent squalls at 7 and 8 p.m. ...

24th.—Bright and dry day, windy, snow melting, roads wet and muddy. ..

25th.—Windy, plenty of sunshine, no sensation of cold felt. ...

26th.— Do. Do. ...

27th.—Fine day, calm. ...

28th.—Cloudy with some wind, cold and raw. ...

1st March.—Cloudy, with wind, cold and raw. ...

2nd.—Clear and bright day, windy. ..

Davos.	St. Moritz.	Andermatt.
Fine early, then cloudy.	Overcast, S. wind, snow.	Cloudy, S. W. wind.
Fine, a few clouds.	Slight cloud, very warm.	A few clouds.
	Fine day, warm.	Clear.
Snow, N. wind strong at times.	Misty, snow falling all day.	Snow.
Cold, dull, slight snow.	Lovely day, felt warm.	Clear.
Faultless.	Fine, wind and cloud later.	Do.
Cloudy, snow, some wind.	Snow falling.	Snow, after noon mist.
Cloudy morning to 10 a.m. with cold wind, clear afternoon, slight N. wind.	Cloudless, light breezes.	Clear.
Cloudless, thal-wind.	Do.	Do.
Cloudless, snow melting.	Cloudless, calm.	Do.
Fair morning, cloudy afternoon, occasional wind, snow melting.	Cloudy, S. wind.	Foggy, after noon clouds, N. wind.
Fine, cold wind, thaw.	Fair day, slight clouds, N. wind.	Clear.
Clouds with occasional sun, cold wind.	Do.	Almost clear.
Fine, cold N. wind.	Passing clouds, N. wind.	Clear, N. wind.
Cloudless, no wind.	Lovely day, felt warm.	Clear.
Cloudy and cold, some wind.	Passing clouds, cold wind.	Clouds, N. wind.
Dull, snow, gusts of wind.		
Cloudless, strong cold wind.		

WIESEN.

March.

3rd.—Cloudless, cold winds after 11 a.m. ...

4th.—Cloudless, less wind. ...
5th.—Cloudless, with light breezes, ...

6th.—Clear morning, snow and wind after 11 a.m. ...

7th.—Dull. ...

8th.—Cloudy. ...

9th.—Cloudy and windy. ...

10th.—Overcast, snow and wind. ...

11th.—Bright, overcast with clouds, windy and feeling cold. ...

12th.—Windy, with snow and clouds, short squalls in afternoon and evening. ...
13th.—Snowing nearly all day. ..

14th.—Cloudy morning, bright afternoon, a little wind. Temperature of water in village fountain 40° Fahr., air 21°. .

15th.—Bright and calm morning, stormy afternoon with sunshine, snow disappearing rapidly. ...
16th.—Bright, wind rose at 11 a.m. and continued all day. ...

17th.—Calm and bright morning, a little wind in afternoon. ...

18th.—Fine. ...
19th.—Fine morning, dull afternoon, snow melting. ...

20th.—Dull, calm air, snow melting. ...

Davos.	St. Moritz	Andermatt.
Cloudless, cold wind 10.30 a.m. till 4 p.m.	... ..	... ...
Do.	... ..	... ...
Cloudless, wind from 12.45 to 4 p.m.	... ...	... ...
Clear to 10 a.m. clouds, snow and wind after	... ...	... ...
Snow and high winds.	... ...	... ...
Cloudy, occasional sun.	... ...	... ...
Very cold and cloudy.	... ...	Cloudy
Cloudy morning, afternoon snow and wind.	... ...	Snow, N. wind.
Very cold and cloudy, a little sun.	... ...	Do.
Snow, wind all day.	... ...	Do.
Snow, a little wind.	... ...	Do.
Fairly fine, cloudy, calm.	... ...	Clouds.
Fine, cold wind.	... ...	Almost clear, S.W. wind.
Slight wind, moderately fine.	... ...	Cloudy.
Very fine, slight thalwind.	... ...	Clear.
Do.	... ...	Cloudy.
Clear morning afternoon dull.	... ...	Clouds.
Cloudy, snow melting.	... ...	Almost clear, afternoon a few clouds.

WIESEN (4,771 ft.).	DAVOS (5,105 ft.).
Position.—Wiesen is located on the hill-side, the Landwasser being about 1,000 ft. below the houses. The mountain screen ranges from 3,000ft. to 5,000ft. above. There is in fine weather no morning nor evening mist, and no smoke accumulates, as, with rare exceptions, a constant but imperceptible current of cold air travels down the declivities. Notwithstanding that this motion of the atmosphere is unfelt, it is sufficient to obviate any tendency to stagnation.	Situated on rising ground in the valley itself. Some of the hotels are well placed, but not more than 100 ft. above the Landwasser. The mountain screen ranges from 3,000 ft. to 5,000 ft. A perceptible mist generally covers the valley each morning; this is soon dissipated by the sun, but the usual haze which is seen over villages and small towns is plainly apparent, and remains stagnant all day, unless moved by wind.
Proximity to Glaciers.— * Scaletta, 13 miles to the E. (Small glacier.) Silvretta Glacier, 20 miles to N.E.	Scaletta, 8 miles to S.E. Silvretta, 12 miles N.E. by E.
Lowest Temperatures.—The Thermometer was below zero. Fahrenheit during the winter of 1882-83. On 25th Jan., 1883.—1°·5	19th Nov., 1882.—0°·5. 3rd Dec.—4°·5. 8th Jan., 1883.—1°· 24th.—2°·5. 25th.—9°·7. 26th.—4°· 7th Feb.—0°. 3rd March.—1°·5 9th.—0° 12th.—1°·7.
Pernicious Winds. — The pernicious winds are the south and south-west currents, known locally by the name of "Föhn."	South and south-west winds, as at Wiesen, said to be less frequent than at the latter place.

* The effects of glacial air on the respiration has been noted by Dr. Burney Yeo, who considers that its condensed state gives a sensation of freedom in breathing.—"Health Resorts and their Uses."

ST. MORITZ (6,089 ft.).

The Kulm Hotel is about 300 ft. above the lake. A thin mist hangs over the lake in the early morning, but far below the level of the dwellings. The aspect is more open than Davos, but is sheltered from wind. It is doubtful if any wide difference will be found between the mean temperatures of St. Moritz and Davos, for although St. Moritz is higher and has the reputation of being much colder, the elevation of the Engadiner Kulm is above the zone of intense cold, whilst Davos lies low, and is therefore in the stratum of the colder air of its own valley.

Bernind glaciers, 5 or 6 miles on S. and S.W.

3rd Dec., 1882.—4°·0.

25th Jan., 1883.—1°
25th.—11°·5

3rd March.—0°·5
7th.—5°·7
8th.—1°·6

11th.—3°·6
12th.—3°·7
13th.—1°·

South and south-west wind.

ANDERMATT (4,738 ft.).

Situated in the bed of the extensive valley of Urseren, and well sheltered from wind.

Several glaciers on N.W., W., and S.W., 5 to 6 miles distant. About 20 miles beyond these lie the extensive glaciers of the Bernese Oberland. Small St. Anna glacier 3 miles to S.

The north wind (Bise) generally feels cold, and deposits snow. The south wind (Föhn) is but little felt, being

WIESEN.

Thalwind (valley-wind).—This wind, which blows in every Swiss valley, is infrequent, as the village is situated far above the bed of the gorge, and consequently out of the zone of commotion of air, caused by the descending cold currents which converge and flow down the gorges and ravines.

Sun-rise and Sunset.—

3 Nov. 1882.—8.40 a.m.
4.0 p.m.

17 Dec.—10.35 a.m.
3.39 p.m.

21 Dec.—10.25 a.m. on plateau.
10.15 a.m. on road.

10.36 a.m. } Hotel.
3.37 p.m. } Palmy.

4 Jan., 1883.—10.36 a.m.

DAVOS.

A gusty thalwind is often felt between 2 and 3 p.m. frequently necessitating instant shelter within the house, unless brisk exercise can be taken.

3 Nov.—8.0 a.m. } Hotel
3.20 p.m. } Buol.

7 Dec.—9.57 a.m. } Hotel
3.6 p.m. } Belvedere.

10.11 a.m. } Hotel
3.10 p.m. } Buol.

10.31 a.m. } Hotel
3.16 p.m. } Angleterre.

St. Moritz.

No regular valley wind, blowing from a definite direction, independently of the upper current. Nevertheless, the wind rises regularly in the course of the day, and is unpleasant from either the north or south.

During January the rate from 3 p.m. to 9 a.m. was 1·84 miles; from 9 a.m. to 1 p.m., 2·53 miles; and from 1 p.m. to 3 p.m., 3·65 miles. The relation during the twenty-four hours was much the same for the other months.

The wind for the four months of November, December, January, and February was 6.619 miles, nearly equally divided.

(These observations were made in a fairly well-exposed situation, by Mr. Waters, during the winter 1882-3.)

15th Nov.—9.30 a.m.
3.30 p.m.
25th Dec.—9.55 a.m.
3.0 p.m.
1st Jan., '83.—10.0 a.m.
3.5 p.m.
15th Jan.—10.0 a.m.
3.20 p.m.
6th Feb.—8.0 a.m.
4.5 p.m.
15th Feb.—7.45 a.m.
3.50 p.m.
1st March.—7.15 a.m.
4.5 p.m.

Andermatt.

arrested in its course by the Gursten (9,423 ft.). The west and southerly winds are of a higher temperature, but do not usually deposit moisture, unless cooled by northerly currents.

Thalwind during the summer months: very little in winter.

31d Nov., '82.—8.0. a.m.
4 30 p.m.
21st Dec.—11.50 a.m.
3.20 p.m.
20th Jan., '83.—10.0 a.m.
4.0 p.m.

12th Feb.—8.0 a.m.
4.30 p.m.

WIESEN.

3.50 p.m.
18 Jan.—10.10 a.m.
4.3 p.m.
6 Feb.—9.9 a.m.
4.28. p.m.
12 Feb.—8.54 a.m.
4.28 p.m.
22 Feb.—Sunrise clouded.
4.35 p.m.
24 Feb.—8.14 a.m.
Clouded.
2 March.—8.0 a.m.

DAVOS.

1 Jan., 83.—10.3 a.m. } Hotel
3.0 p.m. } Belvedere.
18.—9.51 a.m. } Belvedere.
3.27 p.m. }
10.5 a.m. } Buol.
3.32 p.m. }
10.22 a.m. } Angleterre.
3.38 p.m. }
7 Feb.—9.20 a.m. } Belvedere.
3.40 p.m. }
10 —9.20 a.m.
3.45 p.m.
18.—7.52 a.m.
Clouded.
22.—7.42 a.m.
Clouded.

METEOROLOGICAL NOTES.

THE instruments in use were by Casella, of Holborn, and can therefore be relied on for accuracy. (*a*) A Stevenson's thermometer screen was mounted 4ft. above the surface of the snow, the nearest object being a summer-house of lattice-work 19ft. distant, and two buildings 38 and 57ft. to the north and north-east. On the 6th of January this screen was protected from the intensity of the solar rays by a thin canvas partition placed about 3ft. to the south-west. Although the ventilation of the thermometers was not apparently interfered with, the stillness of the air within the screen caused a larger amount of humidity to be indicated than perhaps was actually the case. As is well known, movement of air around the wet bulb has a marked effect in causing evaporation; this can be seen during occasions of wind when the differences between the dry and wet bulbs are notably greater than during calm weather. The extremely wide differences observed at Davos Platz, suggest the thought that the excessive dryness indicated in this way, depends more on evaporation caused by movement of air, than on the actual amount of moisture in the atmosphere. In addition to this, the management

(*a*) The corrections made at Kew on Cassella's instruments were infinitesimal.

of the wet bulb requires scrupulous attention in a climate where the temperature of the air is at, or below freezing point. The ice cannot be washed off too frequently, as the frozen coating renders the bulb by no means sensitive to external temperature. On many occasions with the "dry" risen to 36 or 38 degs. the temperature of an ice-covered bulb in still air, will remain for hours below freezing-point and betoken a percentage of humidity much too low, and wholly incorrect.

The readings of the solar thermometer, although not more than one or two degrees out, must not be relied on as absolutely exact, as a small quantity of vapour was perceived in the jacket during cold weather, which condensed on the inner surface of the glass, causing too low a reading. A comparison was, however, made with another instrument and a correction applied. Neither of these instruments was placed on the surface of any object, but suspended in the air 4 ft. above snow.

A few experiments were undertaken with a Bennett's electroscope, and an insulated copper ball attached to a pole, for the purpose of determining the presence of electricity in the atmosphere. The results were negative, although on combing the hair with a vulcanite comb crackling was quite audible, and when undressing sparks could sometimes be obtained from a flannel shirt, which gave evidence of the presence of electricity when held about 3ft. over the electroscope.

The temperature of the earth was taken by two thermometers placed in an iron tube driven into the ground, it projected 6in. above the surface, and was surrounded by snow. A cork closed the upper end. Although the temperatures were very steady throughout the winter, it

is possible that the conductivity of the metal might have affected the readings of the thermometer nearest the surface. A thin perforated wooden tube would probably be more suitable for these observations than one of metal.

The detection of ozone in the atmosphere was accomplished by the rough method of Schönbein's test-papers, prepared by M. Jame de Sedan. The depth of tint was always greater during a snow-fall, or when mist enveloped the screen, leading to the supposition that much of the colouring agent might have been due to nitric or other acid present in the air. The papers were exposed for 6 hours only (4ft. 6in. above snow), as the usual time of 12 hours exposure produced too deep a colouring for an accurate comparison with the scale. It is well to note, also, that the sides of the mountains at Wiesen are extensively covered with pines, and the volatile products from these must be taken into account. Exposure of the test-papers in a room with the window slightly open gave no indication of ozone or other colouring agent, nor was the paper altered in tint if placed on a pine branch indoors.

In estimating the amount of cloud the *whole* of the sky visible was taken, as the surrounding mountains considerably shorten the distance of the horizon. The note of "valley-wind" was made from the hotel portion of the village, which is much sheltered by its position; and the force of the upper current was judged from the rate at which the clouds appeared to travel.

The laborious calculations of the percentage of humidity were not undertaken for each observation, as the results obtainable from the indications of the psychrometer are extremely doubtful at these altitudes. The

nearest approach to accuracy might perhaps be obtained by the Italian method of screening thermometers, and the use of Apjohn's or Regnault's formulæ in working out the calculations, but up to the present time no convenient instruments have been invented to ascertain with precision the amount of moisture in the atmosphere, except the chemical hygrometer—a rather cumbersome apparatus requiring the employment of a delicate balance.

A calculation has, however, been made from the mean temperatures of each month, the "dew point," "relative humidity," and weight of vapour in a cubic foot of air being deduced from Dr. Apjohn's formulæ.

In scrutinising the "relative humidity," it must be remembered that this percentage gives no clue to the absolute weight of moisture in the atmosphere unless the temperature is taken into account; and for comparison with other climates "*relative* humidity" is not only useless, but misleading. For example, with a percentage of 80 at Cannes, the weight of a cubic foot of vapour would be $6\frac{1}{4}$ grains; whilst at Davos, the same percentage might represent 1·7 grains, during what may be considered a warm day.

Meteorological Observations taken at Wiesen during the Winter of 1882-3.

	At 9 A.M.										At 3 P.M.												
	Temperature, Fahr.					Wind.			Cloud.		Temperature, Fahr.					Wind.			Cloud.		Rain Gauge.	Snow.	
	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10)	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10)			
1882																					mm.	centi-metres.	
Nov. 1	45.	38.	45.	30.	101	0	0	0	0	0	53.5	42.	56.	44.	118	0	0	0	cir	1	0.3		
2	36.	32.8	54.5	33.	65	0	NE	2	cum	3	44.	38.	46.1	36.	110	0	0	0	0	0			
3	42.2	33.	44.	32.	98	0	0	0	0	0	46.8	39.	52.	41.	116	0	W	2	cir	1			
4	38.	32.1	51.2	32.	83	0	N	2	cir	2	47.	40.	50.	38.	120	0	NW	1	cir	1			
5	44.	39.	44.	36.	95	0	NW	1	c.c.	1	38.5	36.	49.	32.	114	0	NW	1	cir	1			
6	40.	35.	39.	34.	94	0	NW	2	c.c.	2	38.5	37.	49.	32.	112	0	0	0	0	0			
7	41.	34.	41.	35.	92	0	0	0	0	0	52.5	42.	54.4	40.	116	0	0	0	0	0			
8	39.9	34.1	53.5	29.	58	0	W	3	c.c.	4	46.2	37.2	47.2	39.	89	1 & 2	W	4	nimb	7 to 10			
9	43.	40.	46.8	40.	56	1	SW	3	over	10	40.5	39.	49.	41.	93	1 & 2	SW	2	over	10			
10	30.	30.	41.5	27.5	93	0	W	1	cum	7	32.2	31.	34.9	29.	90	0	W	2	cum	5	2.3		Fog and snow-water in rain gauge.
11	29.3	27.	33.1	22.	49	0	W	3	c.n.	7	39.4	33.8	43.	28.5	103	0	W	2	cir	5	1.5		
12	26.	24.	40.	21.5	72	0	0	0	cir strat	1	36.	31.	39.2	25.	115	1	W	2	c.c.	7	0 2	2.	
13	35.2	30.	36.	31.	55	0	0	0	over	10	39.2	33.	40.7	35.	84	1	W	1	over	10			
14	35.1	31.9	40.	32.5	57	0	0	0	c.c.	2	43.6	38.1	47.	28.4	112	2	SW	4	cir nimb	6			
15	32.7	32.7	44.	32.5	59	0	0	0	fog	10	29.8	28.2	33.5	29.	59	0	W	1	over	10	3.6		
16	24.1	22.8	30.2	18.	63	0	SW	1	c.c.	6	32.8	29.8	35.2	23.	116	0	0	0	over	10	5.0	6.	
17	26.6	25.	33.5	22.5	51	0	0	0	over	10	28.	25.	33.5	26.	109	2	NW	2	r. cum	7	5.5	10.	
18	20.6	19.2	28.	12.5	49	1	NW	1	roll cum	7	21.	19.2	26.8	19.	111	0	NNW	1	r. cum	6	4.0	4.	Fog and snow-water.
19	19.	17.	21.9	8.5	52	0	0	0	over	10	25.	24.2	25.4	17.5	55	0	0	0	snow	10			
20	23.8	23.	27.6	21.	56	0	0	0	over	10	27.	26.	31.7	23.	67	0	W	1	snow	10	15.0	25.	
21	18.	16.7	27.2	16.8	59	0	W	1	c.c.	2	25.1	23.1	35.	17.	129	1	NW	2	roll cum	8	1.5	1.5	
22	19.	18.	25.3	17.2	39	1	NNW	1	c.c.	3	28.	24.5	35.	18.5	111	1	NW	1	roll cum	8			
23	33.6	32.	33.8	23.	...	1	NW	2	over	10	39.	37.	42.9	32.5	113	2	W	2	c.c.	2	8.2	11.	
24	40.	35.6	40.7	33.	90	2	W	3	c.c. c.st.	4	39.	36.5	43.8	38.	79	0	0	0	over	10			
25	30.	27.	43.6	27.5	54	0	W	1	c.c.	3	38.9	33.2	46.5	29.	121	0	0	0	over	10			
26	38.	34.	39.2	34.2	55	0	W	2	c.c.	1	45.	39.	49.8	37.5	129	0	0	0	over	10			
27	32.	31.	46.2	30.	58	1	SW	1	snow	10	29.2	28.5	46.1	29.	86	0	W	1	c.c.	4	7.5		Snow-water.
28	21.2	19.7	30.1	16.	49	0	0	0	over	10	23.1	21.	28.2	19.5	116	0	NW	1	over	10	1.3		Mist.
29	20.	20.	23.2	17.	52	1	N	2	fog	10	20.3	18.8	28.	18.5	114	0	NW	1	c.c.	4	5.1	7.	
30	24.	22.	24.1	15.	48	0	0	0	over	10	26.	25.	32.5	23.	99	0	0	0	over	10			
Means for the month.	31.5	28.5			65						35.8	31.8			103						61.0	66.5	Total

Meteorological Observations taken at Wiesen during the Winter of 1882-83.

	AT 9 A.M.										AT 3 P.M.												
	Temperature Fahr.					Wind.			Cloud.		Temperature Fahr.					Wind.			Cloud.		Rain Gauge.	Snow.	
	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10)	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10)			
1882																					mille-metre	centi-metre	
Dec. 1	21.	20.	26.2	18.5	40	0	N	2	c.c.	4	20.	20.	24.	19.5	50	0	0	0	c.c.	4	0.2	...	Snow-water in rain gauge.
2	14.6	14.3	20.2	13.	49	0	NW	2	c.c.	9	15.5	13.5	19.1	13.	69	3	N	4	over	10	0.8	2.	
3	5.2	4.2	16.	2.	31	0	0	0	blue	0	19.8	17.5	24.	4.	103	0	0	0	over	10			
4	31.1	29.8	31.2	18.5	52	1	W	4	cum nimb	9	36.	33.	40.8	30.	114	1	W	3	cum nimb	8	0.4	.5	
5	25.	23.8	36.2	22.	59	3	W	4	cum nimb	7	30.	27.	36.6	24.	81	2	W	3	over	10	5.6	10.	
6	19.	17.8	30.	16.5	41	0	WSW	3	cirr	1	28.	25.	32.	17.5	109	0	0	0	blue	0	2.6	4.	
7	27.	24.8	28.1	16.5	82	1	SW	3	over	10	33.2	30.5	42.	26.	126	1	SW	3	c.c.	3			
8	23.8	23.8	33.	21.5	58	0	0	0	over	10	30.5	28.5	33.5	22.2	109	0	W	3	c.c.	3	0.5	1.	
9	20.	17.	31.6	17.	83	1	SW	3	c.c.	1	29.	26.	31.5	18.	86	0	0	0	over	10			
10	33.	32.5	33.7	25.	44	1	0	0	snow	10	31.	31.	34.5	30.	50	1	0	0	snow	10	...	8.	
11	23.	23.	32.	21.5	46	0	0	0	fog	10	24.	24.	24.8	21.5	46	0	0	0	fog	10	19.7	11.	
12	26.5	24.5	27.	20.	46	1	W	3	cum	1	32.1	29.8	35.5	25.	114	1	SW	4	cum nimb	5			
13	29.8	27.	32.5	25.	51	0	SW	2	c.c.	4	36.2	34.2	40.	28.	107	1	SW	3	over	10			
14	39.	35.8	39.	34.	57	2	SW	5	c.c.	3	40.	36.8	41.	37.5	79	1	SW	4	c.c.	7			
15	36.9	33.	40.5	35.	59	0	0	0	over	10	40.	35.	47.	36.5	112	1	S	4	c.c.	6			
16	36.	32.	40.5	34.	50	0	0	0	cirr	1	39.	33.	44.	31.	90	0	0	0	cirr	2			
17	33.5	30.	43.	32.	88	0	NW	1	cirr	2	38.	33.	45.	32.	109	0	0	0	cirr	1			
18	32.	28.	38.5	30.	94	0	SW	0	0	0	40.	34.	43.	30.	110	0	0	0	0	0			
19	34.5	30.5	41.	32.	71	0	NW	0	blue	0	38.	34.	46.	33.	111	0	0	0	blue	1			
20	30.	26.	36.	27.	83	0	0	0	blue	0	40.5	33.5	43.	29.	115	0	0	0	blue	0			
21	27.7	23.	40.	26.	89	1	NW	3	cirr	1	37.8	30.9	42.2	27.	112	0	0	0	cirr	2			
22	26.5	25.	38.1	25.	91	1	NW	3	cum	3	33.	30.	38.	24.5	118	2	WSW	4	cum	4	0.1		
23	27.8	26 2	30.	22.5	71	1	0	0	over	10	27.	25.	29.5	26.	54	3	SW	5	snow	10			
24	20.5	20.5	27.5	19.	snow	1	0	0	snow	10	20.5	17.5	27.	19.5	snow	2	E	3	snow	10	10.8	14.5	
25	18.2	17.	21.	15.	...	2	N	5	c.c.	7	22.3	20.5	25.	17.	64	0	0	0	snow	10	6.4	10.	
26	33.5	32.	34.5	19.5	52	2	NNW	6	cum nimb	9	35.1	34.8	39.8	33.	109	1	0	0	over	10	...	...	Rain
27	35.	35.	36.	31.	54	1	0	0	over	10	37.	36.	38.	35.	65	2	0	0	over	10	20.2	3.5	Rain
28	35.2	35.1	37.	33.5	59	1	SSE	4	over	10	41.	39.	46.	35.	119	1	W	3	cirr	2	15.1		
29	32.5	27.5	41.2	20.5	86	0	0	0	blue	0	42.	35.	46.	32.	118	0	0	0	blue	0			
30	30.3	25.5	42.8	28.5	94	2	NW	6	cirr	3	39.	32.	45.	29.5	113	1	NW	3	cum	1			
31	34.8	32.6	42.	32.	95	0	NW	3	cum nimb	9	40.4	35.	42.	33.3	84	0	0	0	over	10			
Means for the Month.	27.8	25.7			64						32.7	29.5			94						82.4	64.5	Total

Meteorological Observations taken at Wiesen during the Winter of 1882-83.

	AT 9 A.M.									AT NOON.									AT 3 P.M.									HALF-AN-HOUR AFTER SUNDOWN.										
	Temperature, Fahr.					Wind.			Cloud.	Temperature, Fahr.					Wind.			Cloud.	Temperature, Fahr.					Wind.			Cloud.	Temperature, Fahr.					Wind.			Cloud.			
	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation	Valley Ind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10).	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10).	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10).	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10).	Rain Gauge.	Snow.	
1883																																						millimetre	centimetre	
Jan. 1	38.	37.	41.	34.	54	0	NW	1	over	10	42.2	40.5	43.	37.5	72	0	W	2	over	10	40.6	39.8	42.	38.	59	0	W	2	over	10	39.8	38.9	41.	40.	54	0	NW	1	...	...	6.		Rain.
2	38.8	36.	40.	35.5	52	0	W	1	blue sky	0	43.	38.2	43.5	38.	84	0	W	2	cir	4	40.	37.4	43.7	40.	83	0	W	1	cir	9	38.	35.7	41.	37.5	56	0	W	1	over	10	1.4		Rain.
3	31.6	31.6	38.5	30.	49	0	NW	2	over	10	33.	30.5	42.	30.	121	0	NW	2	c.c.	7	...	...	...	...	59	...	..	...	...	...	...	...	...	...	...	...	...	...	...	0.1		Mist.
4	24.	23.	31.7	23	54	0	N	1	c.c.	1	35.	29.	35.	22.5	109	0	0	0	0	0	33.5	29.7	36.5	33.	108	0	0	0	0	0	26.	23.7	34.	25.	84	0	0	0	cir	1	1.2	2.5	
5	26.9	22.	27.5	21.	49	0	0	0	strat	1	42.6	32.8	43.	25.	115	1	0	0	0	0	38.2	30.5	44.	36.	121	2	0	0	0	0	34.	28.	38.5	34.	69	0	0	0	c.c.	9			
6	21.	17.8	34.	19.	43	0	0	0	0	0	30.	26.	29.3	20.	105	0	0	0	cir	1	32.	27.	34.	29.	107	1	0	0	cir	1	25.	22.	32.5	25.	62	0	0	0	strat	1			
7	17.8	15.8	24.8	17.8	32	0	E	2	cir	2	26.2	24.	26.5	17.	99	0	0	0	cir	2	26.	23.	27.8	24.5	104	0	NE	1	c.c.	1	25.	18.8	26.	20.	72	0	0	0	cirr	1			
8	10.	9.7	20.	8.	29	0	NW	1	cir	1	17.5	16.2	17.2	8.	54	0	0	0	cir	7	22.2	19.2	22.2	7.	59	0	0	0	c.c.	5	20.	17.4	22.8	19.	64	0	0	0	over	10			
9	18.	16.	20.2	16.	29	1	0	0	blue sky	0	28.	23.	28.1	17.	110	0	W	2	cir	5	28.2	24.2	31.	27.	89	0	NW	3	c.c.	8	26.8	23.2	30.	26.	84	0	NW	1	c.c.	7			
10	28.	25.	28.	24.	44	1	0	0	over	10	35.5	32.	36.	26.5	76	0	0	0	over	10	36.8	31.8	38.1	35.	74	0	SW	1	over	10	35.	31.	38.	35.	54	1	0	0	over	10			
11	33.6	30.5	36.	31.5	52	0	S	1	over	10	38.5	34.	39.8	32.5	84	1	SW	3	c.c.	6	38.7	33.5	41.	37.	106	4	SW	4	c.c.	6	37.	32.5	39.	36.	52	3	S	3	over	10			
12	30.3	26.9	37.	28.	47	1 & 2	SW	2 & 4	c.c.	5	36.1	31.2	37.	29.5	85	1 & 4	S	1 & 4	c.c.	8	40.	34.3	42.	35.	111	1 & 5	S	3	c.c.	3	36.	31.1	40.	36.	77	0	S	1	c.c.	2			
13	34.2	29.8	36.5	27.	54	1	S	2	c.c.	4	42.8	35.	43.	33.	91	5	S	5	nimb	9	42.8	34.5	43.	41.5	83	8	SW	4 to 7	nimb	6	42.	34.	43.	41.5	54	9	SW	4 to 7	cum	2	...	...	Wind in gusts and squalls
14	37.9	33.8	42.	35.	59	0	S	1	c.c.	5	43.7	37.2	44.	37.	110	0	0	0	c.c.	1	42.2	37.	46.	43.	113	0	0	0	c.c.	1	38.	34.8	46.	37.5	87	0	0	0	c.c.	1			
15	33.5	29.6	38.	30.	53	0	SW	1	c.c.	1	40.7	35.7	42.	32.	100	1	SW	2	c.c.	5	40.	35.	41.	35.5	88	1	SW	2	c.c.	6	37.9	33.4	40.	37.5	52	0	S	2	c.c.	2			
16	30.4	29.5	38.	28.5	49	0	0	0	over	10	31.5	30.8	32.	29.	54	0	0	0	over	10	31.	31.	32.	29.5	54	0	0	0	over	10	30.	30.	32.	29.	59	0	0	0	over	10	...	...	Foggy. Snow.
17	26.7	26.7	31.	25.	59	0	0	0	over	10	28.	28.	28.	25.	Snow.	0	0	0	over	10	28.5	28.2	30.	27.	snow	1	0	0	over	10	27.	27.	28.9	26.	snow	0	0	0	over	10	4.5	3.	
18	26.7	25.1	27.5	24.5	Snow.	0	NW	1	c.c.	5	33.	31.	33.4	24.5	105	0	0	0	c.c.	1	32.	29.8	29.5	31.5	109	0	0	0	blue sky	0	28.2	27.2	31.	28.	81	0	0	0	over	10			
19	22.9	21.3	28.	17.	39	0	NE	1	cum	1	32.5	29.2	33.	21.	104	0	0	0	cum	1	35.	32.	37.	31.5	110	1	0	0	blue sky	0	29.5	26.	35.	28.5	90	0	0	0	blue sky	0			
20	28.	22.8	29.8	24.5	39	1	0	0	cir	1	41.	34.	41.5	26.5	111	0	0	0	cir	2	40.5	33.	42.8	38.	111	0	0	0	cirr	3	36.6	30.3	41.2	36.	94	1	NW	1	cirr	2			
21	27.5	22.9	37.	26.	43	0	N	1	cum	1	41.5	34.5	42.	26.5	114	1	0	0	0	0	38.	31.	39.	31.	109	1	0	0	cum	1	34.5	28.8	38.	29.5	105	1	0	0	0	0			
22	21.	17.	29.	18.5	39	0	0	0	blue sky	0	33.	27.	32.5	19.	106	0	0	0	blue sky	0	30.1	29.1	33.5	30.	106	2	N	2	c.c.	2	26.2	23.	32.	24.5	81	2	N	4	over	10			
23	9.	8.5	25.6	8.	44	0	NE	1	c.c.	1	16.8	15.	17.	8.	69	1	E	1	c.c.	2	17.5	14.1	18.5	15.	96	4 to 6	E	4 to 6	cum	2	14.5	12.	13.5	12.	75	4 to 6	NE	4 to 6	cum	5			
24	4.6	4.	14.5	3.	49	0	0	0	blue sky	0	16.4	14.	16.5	3.	92	1 to 5	N	6	c.c.	3	15.2	13.9	17.6	13.	95	6	NE	6	c.c.	3	10.	9.	16.	9.	69	0	0	0	nimb	1	...	...	Wind in gusts.
25	4.5	2.5	10.2	−1.5	16	3	N	5	blue sky	0	19.2	15.4	19.2	3.	91	3	N	5	cir	3	19.2	16.2	23.	18.	99	3	N	5	nimb	4	15.8	13.2	21.5	15.	81	0	0	0	over	10	...	...	Wind in gusts.
26	18.2	16.	18.5	9.	42	1	NW	4	c.c.	6	23.	19.7	27.8	17.	103	2	NW	4	over	10	26.1	23.	27.2	22.	75	2	W	2	over	10	24.1	21.8	27.5	22.5	72	2	W	6	over	10			
27	21.	20.5	24.5	17.5	39	0	0	0	over	10	26.	22.	28.8	20.	105	2	W	4	over	10	23.4	21.4	28.2	22.	106	2	N	5	cum	6	21.8	20.	27.9	21.	49	2	N	4	cum	5	1.0	2.	
28	28.1	26.8	28.3	19.	54	3	NW	6	cum	6	29.	27.	30.5	26.5	89	2	NW	4	cum	7	27.5	26.	31.5	27.	109	2	NW	4	cum	6	25.	23.2	29.	23.5	84	3	N	4	over	10	4.2	5	
29	31.6	27.2	32.	16.	61	0	0	0	bright over	10	45.	38.5	46.	30.	119	2	NW	4	cum	3	43.	37.1	48.	43.	121	1	NW	6	cir strat	1	40.	36.	44.	40.	92	0	NW	3	cir strat	1			
30	35.9	31.1	40.5	35.	55	0	0	0	bright over	10	40.6	34.2	41.5	35.	109	3	W	7	c.c.	2	42.4	35.	44.5	39.5	114	5	W	6	c.c.	4	36.5	31.7	42.4	36.5	103	0	0	0	over	10			
31	25.8	25.4	42.	23.	49	0	0	0	fog	10	32.5	30.5	33.7	24.5	89	1	SW	5	c.c.	5	32.	30.	35.	31.2	106	1	2	6	cum	5	32.5	30.2	33.	31.5	65	1	S	5	over	10	6.4	10.	
Means for the month.	25.3	22.9	...	...	45	.4	...	...	...	4.5	33.0	28.9	...	...	95	1.1	...	...	...	4.6	32.7	28.9	...	...	96	1.8	...	...	...	4.4	27.9	26.4	...	..	73	1	...	...	...	5.8	24.8	22.5	Total

Meteorological Observations taken at Wiesen during the Winter of 1882-3.

	At 9 A.M.									At Noon.										At 3 P.M.										Half-an-hour after Sunrown.											
	Temperature, Fahr.					Wind.			Cloud.		Temperature, Fahr.					Wind.			Cloud.		Temperature, Fahr.					Wind.			Cloud.			Temperature, Fahr.					Wind.			Cloud.		Rain Gauge.	Snow.	
	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Valley Wind.	Upper Current.	Force 0 to 10.	Form.	Amount (0 to 10.)	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10.)	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10.)	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10.)			
1883 Feb. 1	29.5	27.	33.	23.	44	1	SW	3	cum	1	39.6	34.8	40.2	28.5	83	2	SW	3	bright over	10	38.	34.	43.	31.	104	2	S	3	over	10	34.2	31.2	39.	34.	51	0	S	2	over	10	mm.	centi-metres.	
2	29.2	25.8	39.8	25.	...	0	0	0	c.c.	2	40.	34.	45.	29.	...	1	0	0	blue sky	0	34.	30.	40.	30.	...	0	0	0	blue sky	0													
3	30.	26.5	34.5	24.	...	0	0	0	cum	4	42.	36.	46.	28.	...	1	SW	2	cum	6	37.5	34.	42.	37.	..	1	SW	2	over	10													
4	35.	33.	38.	33.	...	0	SW	1	over	10	32.	30.	39.	30.	...	1	SW	2	over	10	31.	29.	32.	30.	...	1	SW	2	snow	10													
5	26.	24.	30.	24.	...	1	NW	2	c.c.	4	29.	35.	40.	25.	...	1	NW	2	blue sky	0	31.	28.	39.	29.	...	1	NW	2	blue sky	0	...	...	...	...	..	...	...	...	..	...	5.2	8.	
6	23.5	19.	29.	21.	...	1	0	0	blue	10	39.5	32.	43.5	22.	...	0	0	0	blue	0	25.5	22.5	40.	24.	...	0	0	0	blue sky	0													
7	15.	12.	25.	11.	...	0	0	0	blue	0	35.	32.	37.5	13.	...	0	0	0	cir	1	25.	20.	25.	22.	...	0	0	0	cirr	1													
8	27.	24.	27.5	18.	60	1	NNW	6	cum nimb	9	35.	29.9	35.8	26.	73	1	NW	6	cum	7	39.	34.2	39.6	29.	104	0	W	6	cirr	1	32.5	28.8	40.	32.	100	2	W	4	blue	0			
9	37.8	33.2	38.1	31.5	66	1	0	0	bright over	10	45.1	38.8	42.7	37.	120	1	0	0	cir	4	42.	37.7	49.	42.	119	1	0	0	c.c.	5	38.9	34.6	42.	38.5	69	1	0	0	cirr	2			
10	31.4	30.1	39.	29.5	49	1	W	4	cir	3	43.	39.	43.	30.2	118	2	W	3	cir	2	44.8	39.6	45.5	41.	119	1	0	0	cirr	1	37.	33.5	45.	37.	104	0	0	0	cum	1	3.1	5.5	
11	36.4	33.	37.	32.2	51	0	0	0	bright over	10	40.5	36.8	41.2	36.	75	2	SW	4	bright over	10	38.2	35.	41.	38.5	69	2	SW	4	bright over	10	32.	32.	39.	31.5	54	1	0	0	snow	10			
12	23.2	22.2	32.5	20.	64	0	SW	2	cum	1	39.	35.6	39.8	22.	115	1	SW	2	cum	1	40.6	35.	42.5	38.5	117	0	SW	2	cum	1	34.	31.	40.	34.	103	0	0	0	0	0	5.1	5.	
13	32.	28.	35.5	25.2	75	1	SW	3	cum	4	38.4	33.	38.6	31.	95	1	SW	3	bright over	10	39.	33.9	41.4	37.5	89	2	SW	4	cum	7	35.8	32.	39.3	35.5	61	2	SW	3	over	10			
14	30.5	30.5	36.	26.5	54	0	0	0	over	10	33.2	33.	34.5	29.5	70	1	0	0	fog	10	35.2	34.	36.	32.5	67	1	S	3	cum	7	30.	28.	35.	30.	64	1	0	0	blue	0	2.7	3.5	
15	31.7	28.3	32.	26.4	66	1	SW	2	bright glare	10	42.6	36.	44.	30.	121	0	0	0	blue	0	44.	37.5	46.	43.	116	0	0	0	blue	0	36.8	32.5	44.8	36.	103	1	0	0	cirr	6			
16	30.2	29.5	37.5	29.	49	0	0	0	snow	10	32.	32.	34.	29.5	59	0	0	0	snow	10	32.	31.	33.4	30.	62	0	0	0	fog	10	28.8	28.2	32.5	29.	54	0	0	0	snow	10			
17	28.	26.8	29.	22.5	59	1	NE	3	cum	7	32.	30.	33.	26.5	79	0	0	0	over	10	31.2	29.4	32.2	31.	74	0	0	0	over	10	28.9	28.	32.4	28.8	53	0	0	0	cum	9	4.0	2.5	
18	22.	19.8	24.	15.	81	0	0	0	blue	0	36.	31.	26.1	19.	113	1	0	0	blue	0	35.2	30.2	38.2	29.8	112	1	0	0	cirr	1	27.	24.	37.	25.5	96	0	0	0	blue	0			
19	26.1	24.2	27.	20.	54	0	0	0	snow	10	30.5	24.2	31.5	24.5	74	0	0	0	snow	10	32.	31.	32.5	30.	...	0	0	0	snow	10	32.	28.	32.	29.	...	0	0	0	over	10			
20	25.	24.5	29.5	23.	...	0	0	0	fog	10	...	...	...	...	...	1	W	2	cum	5	30.	26.5	37.	24.	...	1	NW	2	cum	6	26.5	23	33.	25.	...	...	...	...	...	..	3.5	2.	
21	25.	21.	26.	14.	...	1	NE	3	cir	3	...	...	...	...	...	1	0	0	blue	0	35.5	32.	40.	23.	...	1	0	0	blue	0	29.5	25.	36.	30.									
22	37.	32.	37.	27.	...	0	0	0	blue	0	47.1	40.2	47.9	33.5	118	1	0	0	blue	0	48.	41.	49.3	46.5	119	1	0	0	blue	0	38.6	34.6	48.8	38.	108	0	0	0	blue sky	0			
23	33.5	32.8	38.8	30.5	72	2	NE	4	fog	10	41.6	33.	42.3	33.	118	6	N	6	c.c.	2	38.3	31.8	42.6	38.2	104	5	NW	6	c.c.	7	36.5	30.8	38.9	35.	71	6	N	8	cum nimb	8	1	1.	
24	35.	27.2	36.7	24.	92	3	NE	6	cir	1	41.	29.9	41.8	32.5	115	6	NE	7	cum	1	41.7	32.1	47.8	33.5	128	7	NE	9	cum	3	39.	31.	41.8	38.5	105	7	NE	9	cum	3	.2	...	Snow.
25	32.1	28.9	39.	25.5	57	2	NE	4	over	10	41.	35.	42.	30.	121	3	NE	5	cum	6	42.1	34.5	43.2	40.	123	2	NE	5	cum	6	36.2	32.	41.	36.5	93	3	N	5	c.c.	1			
26	33.8	30.1	31.7	24.5	73	3	N	5	c.c.	6	38.8	30.4	40.6	32.5	110	4	NE	6	c.c.	6	39.5	30.5	40.9	37.4	111	4	NE	6	c.c.	3	34.	28.5	40.2	34.	104	3	NE	6	cirr.	1			
27	30.	25.6	34.9	21.5	78	0	0	0	blue	0	43.8	36.	44.	29.5	109	1	N	3	cir	1	47.	38.5	48.5	43.5	113	0	0	0	blue	0	37.	32.	47.	37.	102	0	N	4	cum	3			
28	35.	30.	37.8	28.5	80	2	N	6	cum	7	35.	31.5	37.5	14.	87	2	N	4	cum nimb	8	37.	32.	38.5	34.5	69	3	NNW	5	cum nimb	9	36.	32.	37.3	31.5	57	2	NNW	5	cum nimb	9			
Means for the month.	29.6	26.7	...	...	64	.8	...	...	...	5.7	38.1	33.4	...	...	98	1.4	...	..	...	4.6	36.9	32.3	..	..	100	1.3	...	...	.	4.5	33.6	30.0	...	...	81	1.4	...	...	...	4.6	24.8	27.5	Total

Meteorological Observations taken at Wiesen during the Winter of 1882-83.

	At 9 A.M.										At 3 P.M.											
	Temperature, Fahr.					Wind.			Cloud.		Temperature, Fahr.					Wind.			Cloud.			
	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Valley Wind.	Upper Current.	Force (0 to 12).	Form.	Amount (0 to 10).	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Valley Wind.	Upper Current.	Force (0 to 12)	Form.	Amount (0 to 10)	Rain Gauge.	Snow.	
1883																					mm	centi-metres.	
March 1	29.8	29.	37.5	26.7	49	2	N	4	fog	10	32.	30.	38.8	28.5	61	2	NE	4	over	10			
2	28.7	21.2	32.4	21.	85	2	N	6	cum	1	32.	28.	36.4	27.	110	3	N	6	cum	4	0.2		
3	18.	15.5	31.	8.	102	1	N	3	cum	1	29.	24.5	30.5	15.	103	3	N	6	blue	0			
4	19.8	17.	29.5	7.	91	0	0	0	blue	0	34.	29.	34.7	17.8	107	3	0	0	blue	0			
5	28.	23.	34.5	15.	97	3	0	0	blue	0	41.	34.	41.	27.	111	3	0	0	...	0			
6	21.4	17.	40.5	15.5	101	2	NW	5	c.c.	7	...	...	...	...	...	2	NE	5	c.c.	8			
7	20.5	18.8	29.6	12.7	109	...	...	...	...	...	...	...	...	...	...	2	NE	5	c.c.	7	2.5	3	
8	11.	9.2	21.9	6.5	59	0	0	0	cum	9	20.	18.	29.	14.3	79	0	0	0	snow	10			
9	21.8	19.5	22.4	9.5	66	0	0	0	bright over	10	27.	25.	31.2	20.	103	2	W	4	over	10			
10	20.1	19.5	28.2	13.5	68	2	W	4	fog	10	22.4	21.	27.2	18.8	82	1	0	0	bright over	10			
11	15.2	14.	23.	6.7	56	1	N	3	c.c.	8	18.2	14.9	23.2	13.5	103	3	NE	3	cum	8	1.5	2	
12	12.1	11.9	18.8	4.5	61	2	0	0	snow	10	12.2	11.	16.	10.5	69	6	N	4	snow	10			
13	8.	6.8	13.	4.5	59	4	SW	4	over	10	10.	10.	11.5	6.8	69	2	SW	4	snow	10	3.5	2	
14	20.5	19.	23.5	7.5	81	2	NW	4	c.c.	9	30.	25.	31.5	18.5	124	3	NW	4	c.c.	4	9.3	11	
15	26.5	22.9	31.8	13.	106	0	0	0	blue	0	30.	24.5	37.8	25.5	128	7	WSW	7	c.c.	3			
16	30.	25.2	32.	19.	102	3	WSW	4	c.c.	3	36.	29.	38.6	28.5	133	6	WSW	8	c.c.	4			
17	30.	26.	32.2	18.	114	1	SW	3	cum	3	39.	32.	41.2	28.1	119	2	WSW	4	cum	1			
18	33.5	28.	39.7	21.4	104	2	W	3	cir	3	38.8	32.5	41.	31.	118	3	WSW	4	cir	1			
19	37.	32.	37.6	27.	89	1	W	3	c.c.	6	41.	35.	44.5	36.4	114	2	WSW	4	over	10			
20	39.	33.	41.4	28.	106	1	E	3	c.c.	5	38.8	34.8	42.6	38.5	107	1	SW	3	over	10			
Means for the month	23.5	20.4			85						29.5	25.4			102						17.0	18.0	Total.

Barometric Readings (absolute).

	Attached Thermometer, Fahr.	Barometer at 7 a.m.	Attached Thermometer, Fahr.	Barometer at 1 p.m.	Attached Thermometer, Fahr.	Barometer at 9 p.m.
1882 Nov. 1	deg. 46	mm. 643.8	deg. 47	mm. 642.5	deg. 46	mm. 642.
2	45	643.8	45	643.7	44	644.4
3	43	644.	45	644.2	47	646.5
4	54	640.9	58	645.7	63	645.7
5	62	647.8	61	649.	58	648.3
6	55	647.	54	647.	54	645.5
7	50	643.	50	642.	49	642.
8	46	639.6	48	637.8	58	636.
9	53	631.	55	628.6	63	634.5
10	61	635.2	60	636.8	62	639.5
11	61	636.	61	634.1	66	638.
12	61	640.	59	641.5	55	641.
13	52	640.	53	639.8	61	639.5
14	62	638.	61	637.5	68	635.5
15	65	633.	63	633.3	69	635.5
16	62	632.7	59	629.	62	627.5
17	58	627.	55	628.5	59	632.5
18	58	635.2	59	635.6	69	637.5
19	61	636.2	57	633.	59	631.7
20	57	629.	55	628.2	59	629.7
21	57	630.5	46	631.3	54	635.
22	57	638.8	56	636.5	62	636.
23	59	637.2	57	638.3	55	638.6
24	51	635.6	53	635.5	61	637.
25	55	637.	61	636.8	65	637.
26	59	635.	57	634.	54	633.
27	52	632.	50	635.5	50	636.
28	45	634.4	43	635.	49	637.
29	49	640.	52	638.5	55	635.
30	50	633.6	50	633.3	50	634.

F

Barometric Readings (absolute).

	Attached Thermometer, Fahr.	Barometer at 7 a.m.	Attached Thermometer, Fahr.	Barometer at 1 p.m.	Attached Thermometer, Fahr.	Barometer at 9 p.m.
1882 Dec. 1	deg. 55	mm. 633.7	deg. 49	mm. 632.5	deg. 59	mm. 632.
2	54	633.3	52	634.5	57	638.5
3	52	638.5	50	635.	46	633.
4	43	629.	41	627.	40	626.3
5	38	624.5	38	622.6	37	623.2
6	34	622.7	41	622.6	55	625.7
7	55	623.	54	622.5	65	626.5
8	63	631.7	60	632.3	63	637.
9	58	637.5	56	637.	63	634.
10	57	631.9	55	629.3	52	628.5
11	48	629.	46	630.3	48	631.6
12	51	632.5	50	634.5	47	636.0
13	45	637.4	43	637.5	50	638.
14	53	638.	52	638.6	54	640.
15	56	641.4	55	641.	63	642.
16	61	642.	60	645.5	55	641.5
17	52	641.5	50	641.	48	641.2
18	46	640.7	45	639.4	52	639.
19	55	641.8	56	642.5	60	645.7
20	58	647.	57	649.	61	649.6
21	57	648.5	55	646.3	63	643.8
22	61	641.8	60	639.8	62	635.7
23	61	626.8	58	628.	54	631.5
24	48	631.	50	633.	61	636.0
25	55	639.7	53	639.	48	632.4
26	46	636.	43	635.	43	637.0
27	41	639.	45	640.5	55	643.0
28	53	644.4	55	645.	59	645.7
29	55	644.	54	643.5	65	644.0
30	63	645.5	63	645.4	66	645.8
31	63	648.	61	647.4	66	647.

G

Barometric Readings (absolute).

	Attached Thermometer, Cent.	Barometer at 7 a.m.	Attached Thermometer, Cent.	Barometer at 1 p.m.	Attached Thermometer, Cent.	Barometer at 9 p.m.
1883 Jan. 1	deg. 20	mm. 645.7	deg. ..	mm. ...	deg. 18½	mm. 649.5
2	15	646.9	14	644.7	17½	644.
3	16	642.7	15	642.	18	644.6
4	16½	645.6	14	645.5	14½	647.
5	14	647.2	13½	647.3	14½	648.4
6	14	648.	13	646.5	10	645.5
7	8	644.	7	643.	5	642.6
8	3	639.8	3	635.3	6	638.
9	6	639.3	5½	639.3	7	639.
10	10	638.6	10½	636.	15	634.7
11	13	633.5	12	632.5	13	635.7
12	12	635.9	11½	635.	14½	635.
13	13	632.2	14	629.5	17½	631.
14	15	633.5	14	634.	12	635.4
15	10	635.5	9	635.5	8	634.3
16	7	633.5	9½	635.0	12	638.7
17	11	643.	10½	644.6	12½	646.4
18	12	642.8	11½	647.4	13	649.4
19	13	650.	13	649.8	16½	651.
20	13½	650.	15½	650.	17	649.5
21	12	648.5	15	648.4	11	648.4
22	8	647.9	8	647.	11½	646.
23	11½	647.	10	646.6	14	646.7
24	11	644.5	9	642.	12	640.8
25	10	634.6	8	635.	13½	636.3
26	10½	635.	9	633.7	15	635.4
27	13	638.2	14½	643.2	17	647.
28	13	642.5				
29	...	...	...	...	10	644.3
30	11½	640.	...	...	10	639.5
31	8	635.3	8	631.4	13½	629.3

H

Barometric Readings (absolute).

	Attached Thermometer Centigrade.	Barometer 7 a.m.	Attached Thermometer Centigrade.	Barometer 1 p.m.	Attached Thermometer Centigrade.	Barometer 9 p.m.
1883. Feb. 1	deg. 12	mm. 628.7	deg. 11	mm. 633.	deg. 14	mm. 637.
2	14½	638.6	14	640.	17	642.5
3	15	644.4	14½	644.7	7	645.6
4	7	644.	6	644.	7	642.2
5	6	647.	6	646.5	8½	645.8
6	13	644.5	14	642.6	17	642.
7	15½	641.3	15	640.7	18	642.7
8	15	643.2	14	643.2	17½	644.1
9	15	642.3	14	642.8	18	645.
10	16½	645.2	16½	645.	18	644.
11	15	643.	14	643.	12	646.9
12	9	645.	9	644.2	8	643.2
13	6	641.7	7	641.3	11½	642.7
14	12	645.	13	646.3	17	648.
15	14	649.	13	648.	11	647.5
16	9½	646.1	9½	645.	15	647.7
17	13	648.	13	647.3	10	646.3
18	8	645.	7½	642.3	6	641.8
19	4½	641.2	4	642.3	11	643.3
20	13	646.2	13	648.	17	651.
21	13	653.6	12	653.7	16½	655.6
22	13	654.6	12	654.6	11	655.5
23	9	656.	12	655.5	15½	657.
24	13	656.5	14	655.	16½	654.3
25	14	654.6	13	653.7	11	654.6
26	9½	652.7	9	652.	13	652.3
27	12	651.5	12	650.6	14	650.8
28	11½	649.	11	648.4	15½	649.3

Barometric Readings (absolute).

	Attached Thermometer Centigrade.	Barometer 7 a.m.	Attached Thermometer Centigrade.	Barometer 1 p.m.	Attached Thermometer Centigrade.	Barometer 9 p.m.
1883. March 1	deg. 14	mm. 646.5	deg. 14	mm. 646.	deg. 18	mm. 647.6
2	15½	647.6	14	646.	17	648.1
3	14½	648.5	13½	648.6	10	648.6
4	7	648.	6½	647.3	5	648.
5	3	646.	3	644.6	7½	643.3
6	7	637.5	7½	632.7	9½	630.
7	7	628.	10	627.5	14	627.6
8	11	625.8	11	625.5	16	628.6
9	15	629.	14	629.3	18	628.
10	15	622.	14	622.	17½	625.7
11	14	625.7	12	626.	9	626.
12	6	624.	4½	625.8	5	629.
13	7	633.2	7½	634.3	12½	636.4
14	10	638.	9½	636.6	11½	635.6
15	10	634.	9	633.6	7½	632.3
16	5	631.4	6	631.3	10	634.
17	8½	635.	11½	635.	13½	636.2
18	11	636.7	12½	637.3	14	639.6
19	12½	637.8	11	636.2	16	634.5
20	13½	632.4	13½	631.3		

I

Ozone, Earth Temperature, Terrestrial Radiation, &c.

	Air Temp. 8 A.M.	Earth Temp. 33 Centimetres.	Earth Temp. 74 Centimetres.	Terrestrial Radiation.	Ozone 6 hours exposure. 0° to 20°.
1882					
Nov. 15	32	39.	43.		5
16	21	38.8	43.		6
17	25	38.5	43.		6
18	19	38.	43.		9
19	15	38.	43.		9
20	24	38.	43.		9
21	18	38.	42.5		7
22	20	38.	42.5		7
23	32	38.	42.5		8
24	39	38.	42.		5
25	28	37.5	42.		5
26	38	37.7	42.		5
27	31	37.	41.5		12
28	19	37.	41.		9
29	21	36.5	41.		9
30	22	36.5	41.		7

Ozone, Earth Temperature, Terrestrial Radiation, &c.

	Air Temp. 8 A.M.	Earth Temperature. 33 Centimetres.	Earth Temperature. 74 Centimetres.	Terrestrial Radiation.	Ozone 6 hours exposure. 0° to 20°.
1882					
Dec. 1	21	36.5	41.	...	9
2	14	36.5	41.	...	8
3	5	36.5	41.	...	6
4	29	36.5	40.5	...	7
5	25	36.5	40.5	...	7
6	19	36.	40.5	...	7
7	27	36.	40.5	...	4
8	23	36.	40.	...	8
9	20	35.5	40.	...	4
10	33	35.5	40.	...	8
11	24	35.5	40.	...	8
12	26	35.5	40.	...	7
13	28	35.5	40.	...	5
14	38	35.5	39.5	...	5
15	38	35.5	39.5	...	5
16	35	35.5	39.5	...	5
17	...	35.5	39.5	...	..
18	...	35.5	39.5	...	...
19	...	35.5	39.5	...	...
20	..	35.5	39.	..	...
21	28	35.5	39.	11	4
22	27	35.5	39.	18	8
23	28	35.	39.	18	8
24	20	35.	39.	...	7
25	17	34.5	38.7	...	7
26	33	35.	38.7	...	7
27	34	35.	38.7	...	9
28	35	34.5	38.7	..	8
29	32	34.5	38.7	18	5
30	31	34.5	38.7	17	6
31	33	35.	38.5	24	6

Ozone, Earth Temperature, Terrestrial Radiation, &c.

	Air Temp. 8 A.M.	Earth Temperature. 33 centimetres.	Earth Temperature. 74 centimetres.	Terrestrial Radiation.	Temperature over Snow. 8 A.M.	9 A.M.	Noon.	3 P.M.	½ hour after Sunset.	Ozone 6 hours exposure. 0° to 20°.
1883.	Deg.									
Jan. 1	38	35.	38.5	32	38	...	41	...	...	9
2	37	34.5	38.5	30	33	...	...	34	...	6
3	31	34.5	38.5	24	...	31	...	...	...	7
4	24	34.5	38.5	14	...	...	...	. .	17	4
5	27	34.2	38.	8	...	...	...	34	...	4
6	21	34.2	38.	8	...	...	...	30	...	5
7	18	34.2	38.	7	16	...	27	24	16	5
8	10	34.2	38.	—.5	7	...	20	20	16	6
9	18	34.	38.	6	...	15	26	28	25	6
10	26	34.	38.	16	24	27	34	33	32	5
11	33	34.	38.	26	31	33	36	36	34	5
12	30	34.	38.	22	28	29	36	35	34	4
13	31	34.	38.	27	28	28	40	38	37	4
14	36	34.	38.	28	31	34	38	36	34	5
15	32	34.	38.	20	28	31	36	35	34	5
16	30	34.	38.	25	29	31	32	32	25	7
17	26	34.	38.	...	28	28	30	28	26	6
18	26	34.	38.	16	26	28	30	29	28	7
19	21	34.	38.	6	20	22	30	30	28	5
20	27	34.	38.	13	23	22	35	36	32	4
21	28	34.	38.	13	24	23	34	34	31	3
22	20	33.5	37.5	8	17	17	29	27	23	4
23	10	33.5	37.5	0	8	7	18	16	12	7
24	4	33.	37.	—6	3	3	18	16	8	6
25	2	32.5	37.	—11	0	2	18	18	14	5
26	15	32.2	37.	0	14	19	28	27	23	5
27	20	32.2	37.	8	20	22	24	24	22	9
28	27	32.2	37.	12	25	28	30	28	23	5
29	29	32.2	36.5	10	28	31	38	38	35	5
30	35	32.2	36.5	...	33	34	35	34	34	4
31	29	32.2	36.5	22	27	27	34	32	32	7

Ozone, Earth Temperature, Terrestrial Radiation, &c.

	Air Temp. 8 A.M.	Earth Temperature.		Terrestrial Radiation.	Temperature over Snow.					Ozone 6 hours exposure. '0 to 20'.
		33 centimetres.	74 centimetres.		8 A.M.	9 A.M.	Noon.	3 P.M.	½ hour after Sunset.	
1883.										
Feb. 1	29	32.2	36.	22	27	28	37	34	32	5
2	26	32.2	36.	17	27					
3	...	32.2	36.							
4	...	32.2	36.							
5	...	32.2	36.							
6	..	32.2	36.							
7	...	32.2	36.							
8	23	32.2	36.	7	25	35	36	33	31	4
9	36	32.3	36.	25	34	36	39	36	33	7
10	31	32.3	36.	26	29	30	36	35	33	9
11	36	32.3	36.	26	34	35	36	35	32	5
12	22	32.3	36.	18	24	22	32	34	31	6
13	30	32.3	36.	18	29	33	37	34	34	6
14	29	32.3	36.	26	30	32	32	34	29	5
15	27	32.3	36.	15	26	32	35	36	33	5
16	30	32.4	36.	22	30	31	32	32	30	9
17	25	32.4	36.	...	27	30	32	32	30	7
18	16	32.2	36.	6	17	21	32	32	26	4
19	24	...	...	...	24	28	32			
20										
21										
22	...	32.4	36.	...	...	...	38	38	35	
23	32	32.3	36.	27	32	34	36	35	34	8
24	26	32.3	36.	15	25	33	38	38	34	8
25	29	32.3	36.	15	29	32	37	36	33	7
26	30	32.3	36.	15	30	32	38	38	32	6
27	25	32.3	36.	11	25	29	36	38	34	4
28	33	32.3	36.	20	31	32	34	36	34	7

Ozone, Earth Temperature, Terrestrial Radiation, &c.

	Air Temp. 8 A.M.	Earth Temperature.		Terrestial Radiation.	Temperature over Snow.					Ozone 6 hours exposure. 0° to 20°.
		33 centimetres.	74 centimetres.		8 A.M.	9 A.M.	Noon.	3 P.M	½ hour after Sunset.	
1883.										
March 1	29	32.3	36.	23	...	30	...	32	...	8
2	23	32.3	36.	11	...	22	...	...	...	6
3	10	32.	36.	—2	...	17	...	...	...	6
4	13	32.	36.	—3	...	19	...	...	...	5
5	23	32.	36.	4	...	22	...	...	...	5
6										
7										
8	11	32.	36.	—5	...	12	...	...	...	6
9	18	31.5	36.	0°	...	20	...	...	...	4
10	18	31.	35.5	7	...	21	...	25	...	7
11	14	31.	35.5	—1	...	17	...	...	...	6
12	10	31.5	35.5	—8	...	13	..	...	...	12
13	7	31.	35.	0	...	8	...	...	...	9
14	20	30.5	35.	4	.	28	..	...	...	5
15	23	31.	35.	3	...	24	...	...	..	3
16	26	31.	35.	14	...	30	..	...	...	5
17	27	31.5	35.	5	...	29	...	...	...	4
18	29	31.7	35.	5	..	27	...	...	..	4
19	35	31.7	35.	24	...	35	..	...	...	3
20	32	32.	35.2	19	...	...	...	...	..	5

Ages at Death of the Inhabitants of Wiesen since 1834, excluding Children of 3 years and under.

1834 to 1842.		1843 to 1852.		1853 to 1862.		1863 to 1872.		1873 to 1882.	
Yrs.	Mths.	Yrs.	Mths.	Yrs.	Mths.	Yrs.	Mths.	Yrs.	Mths.
9	10	11	3	83	0	77	6	60	2
75	8	61	0	48	7	7	9	50	6
64	11	64	6	72	3	22	11	69	5
63	2	80	5	47	4	45	8	78	7
70	1	64	2	71	6	68	0	68	7
52	8	14	6	71	4	72	2	69	8
78	8	81	11	79	8	76	2	72	8
77	11	83	8	61	0	69	1	70	5
76	0	12	5	61	2	54	1	68	11
35	6	18	2	50	5	6	1	63	4
79	7	71	8	66	5	59	3	71	9
73	4	62	11	77	9	65	1	82	8
78	0	77	2	61	1	72	8	84	6
11	9	78	0	42	9	72	9	74	3
72	3	61	11	73	6	57	3	70	7
67	3	74	0	59	4	76	10	85	9
54	2	69	2	65	11	88	3	68	4
79	0	80	9	81	1	73	4	64	11
60	8	61	6	76	10	72	1	25	0
77	10	58	4	71	8	84	1	41	1
73	6	48	8	63	1	79	0	60	5
60	0	69	8	65	10	81	0	87	6
		27	0	58	0	54	8	82	6
		66	2			37	0	81	0
		69	4			31	0		
						78	2		
						81	11		
						77	11		
						83	0		
						71	11		
						78	1		
						40	3		
						21	6		
						59	4		
						84	4		
Average age at death ...	63		58		65		62	68	8

Causes of Death since 1834.

Persons under 50 years of Age (included on other side).		Children under 3 years of Age (not included on other side).	
Ages.	Cause of Death.	Ages.	Cause of Death.
48 years	Brain disease.	3 years	Convulsions.
48 ,,	Pleuritic effusion.	2 ,,	Drowned in fountain.
47 ,,	Dropsy.	2 ,,	Convulsions.
45 ,,	Drink, &c.	2 ,,	Accident.
42 ,,	Brain disease.	1 ,,	Convulsions.
41 ,,	Hernia (operation).	7 months	Do.
40 ,,	Drowned.	5 ,,	Hernia.
37 ,,	Kidney and heart disease.	5 ,,	Whooping-cough.
35 ,,	Dropsy.	5 ,,	Cough & convulsions.
31 ,,	Dysentery.	3 ,,	Convulsions.
27 ,,	Inflammation of lungs.	1 ,, (twins)	Do.
25 ,,	Inflammation of bowels.	1 ,, (twins)	
22 ,,	Tubercle ?*	26 days	Do.
21 ,,	Drowned.	21 ,,	Diarrhœa.
18 ,,	Nervous fever.	8 ,,	Feebleness.
14 ,,	Brain disease.	6 ,,	Do.
12 ,,	24 hours' illness.	1 ,,	Do.
11 ,,	Inflammation of bowels.	1 ,,	Do.
11 ,,	Do.		
9 ,,	Nervous fever.	6	Stillborn.
7 ,,	Inflammation of bowels.	1	Premature.
6 ,,	Fever.	1	Dying at birth.

* Dr. Weber, who has practised in Alveneu-Bad and Wiesen for many years, tells me that he has never known a case of phthisis among the inhabitants of Wiesen; and this death attributed to "tubercle" was inserted by the local clergyman, and not by any medical authority.

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The number of the inhabitants for the decade ending 1882 has been estimated to vary from 140 to 170. Excluding children under two years of age, the mean age at death for this period is very remarkable: only 3 deaths out of 24 having taken place below the age of 60 years (1 suicide, 1 abdominal inflammation, 1 surgical operation for hernia); whilst one quarter of the total number reached the age of 80, and another quarter 70 years.

In their habits the Wieseners are very thrifty, intermarry rather closely, seldom eat meat, drink schnapps, and consume large quantities of inferior tobacco. They are engaged in the care of cattle, and in agriculture—growing hay and potatoes—the altitude being too elevated for corn, which accounts for the poverty of the village. Like many Switzers they suffer from spongy gums, lose their teeth very early, and become prematurely old.

Summary of Observations—Winter 1882-83.

	At 9 A.M.					At Noon.					At 3 P.M.					Half-an-hour after Sundown.					Rain Gauge.	Snow.	Ozone, 0° to 20°, 6 hours' exposure.
	Dry Bulb.	Wet Bulb.	Dew Point.	Relative Humidity.	Solar Radiation.	Dry Bulb.	Wet Bulb.	Dew Point.	Relative Humidity	Solar Radiation.	Dry Bulb.	Wet Bulb.	Dew Point.	Relative Humidity.	Solar Radiation.	Dry Bulb.	Wet Bulb.	Dew Point.	Relative Humidity.	Solar Radiation.			
Nov., 1882	31.5	28.5	24.1	73	65	...	...	...	...	...	35.8	31.8	26.8	69	103	...	...	...	...	..	61.	66.5	7.3
Dec., 1882	27.8	25.7	22.6	79	64	...	...	...	...	...	32.7	29.5	25.1	73	94	...	...	...	...	...	82.4	64.5	5.7
Jan., 1883	25.3	22.9	19.	75	45	33.	28.9	23.5	67	95	32.7	28.9	24.	69	96	27.9	26.4	24.4	85	73	24.8	22.5	5.4
Feb., 1883	29.6	26.7	22.2	72	64	38.1	33.4	27.1	64	98	36.9	32.3	25.9	63	100	33.6	30.	25.1	70	81	24.8	27.5	6.2
Mar., 1883	23.5	20.4	14.5	66	85	...	...	...	...	...	29.5	25.4	19.0	63	102	...	...	...	...	...	17.	18.	5.7
	27.5	24.8	...	73	64.6	35.5	31.1	...	65	96.5	33.5	29.5	...	67	99	30.7	28.2	...	77	77	210.	199.	6.

Mean Temperature for the Winter = 31°.8 Fahr. (including all observations).

Average Relative Humidity for the Winter = 70 per cent. (or 1.4 grains of moisture in the cubic foot of air).

Average daily quantity of Ozone, with 6 hours exposure (scale 0° to 20°) 6°.

Average Fall in Afternoon Temperature, Half-an-hour after Sundown, 2°.8, Fahr.

Mean Temperatures of Wiesen and Davos, calculated from Daily Observations made by Swiss Observers.

	WIESEN.				DAVOS (DAVOSER BLÄTTER).		
	Air Temperature at 7 A.M., Centigrade.	Air Temperature at 1 P.M., Centigrade.	Air Temperature at 9 P.M., Centigrade.		Air Temperature at 7 A.M., Centigrade.	Air Temperature at 1 P.M., Centigrade.	Air Temperature at 9 P.M., Centigrade.
Nov., 1882	—1.64	3.77	—0.43	Nov., 1882	—3.66	3.66	—1.96
Dec., 1882	—2.79	1.25	—2.07	Dec., 1882	—5.70	—0.45	—4.80
Jan., 1883	—4.43	1.02	—3.5	Jan., 1883	—7.4	—0.4	—6.1
Feb., 1883	—3.04	3.4	—1.7	Feb., 1883	—5.3	3.3	—3 7
Mar., 1883	—7.80	—1.4	—6.3	Mar., 1883	—10.7	—1.4	—8.4
	—3.9	+1.6	—2.8		—6.5	+0.9	—4.9

Mean Temperature of Wiesen* —1°.7, Centigrade.

Mean Temperature of Davos —3°.5, Centigrade.

Mean Temperature of Wiesen, from observations taken at 9 a.m. and 3 p.m, as shown in previous tables, 30°.5, Fahr. = —0°.83, Centigrade. Reckoning in Observations made during the Months of January and February, at Noon and Half-an-hour after Sundown, the Mean Temperature reaches 31°.8, Fahr., = —0°.1, Centigrade.

* A slightly lower temperature than ought to appear may be caused by terrestrial radiation affecting the instruments used by Herr Schmidt. His thermometer screen at Wiesen is placed out of a window, and being in a shady position probably registers too low a temperature.

Average Amount of Cloud, Valley Wind, and Maximum Daily Solar Radiation.

	At 9 A.M.		At Noon.		At 3 P.M.		Half-an-hour after Sundown.		
	Valley Wind.	Cloud.	Valley Wind.	Cloud.	Valley Wind.	Cloud.	Valley Wind.	Cloud.	Maximum Solar Radiation
Nov., 1882	.2	5.5	...	...	.4	6.2	...	...	104
Dec., 1882	.7	5.2	...	...	.7	5.7	...	...	95
Jan., 1882	.4	4.5	1.1	4.6	1.8	4.4	1.	5.8	98
Feb., 1883	.8	5.7	1.4	4.6	1.3	4.5	1.4	4.6	100
Mar., 1883	1.4	5.2	...	...	2.8	6.	...	...	102
	.7	5.2	1.2	4.6	1.4	5.3	1.2	5.2	99.8

Average Force of Valley Wind, 1.1

Average Amount of Cloud, 5.

Average Solar Radiation, 99°.8

Highest Temperature Registered by the Solar Thermometer during the Winter, 133°, Fahr.

Lowest Temperature of Terrestrial Radiation, —11°, Fahr.

Highest Maximum Thermometer, 1st November, 1882, 56°, Fahr.

Lowest Minimum Thermometer, 25th January, 1883, —1°.5, Fahr.