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BULLETIN

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THE AVAILABILITY OF NEW MEXICO'S CLIMATE FOR OUTDOOR LIFE.*

BY JOHN WEINZIRL, M. S.

Climates are resorted to by invalids for many and varied ailments, but health is obtained only when they live in the natural, outdoor climate, and not in the artificial one furnished in our houses. That our dwellings present artificial conditions is apparent even from a superficial consideration. There is, first of all, a great reduction in the amount of sunlight as compared with that afforded by nature. While it is true that we do not fully understand the physiological effects of sunlight upon animal life, it is a matter of common observation that persons whose occupations permit them to enjoy little sunlight possess a pale and unhealthy complexion. As the potato sprouting in a dark cellar, produces a chlorophylless stem, so the person continually confined in the dark fails to develop sufficient blood cells and haemoglobin. The prison palor has become proverbial.

Then, too, the house presents artificial conditions with respect to temperature. At first thought this might be considered an advantage, an improvement over nature, but in a broad sense it is never so. Man in common with other creatures has developed through ages into harmony with nature. It is a fact that the variations in temperature stimulate the body in a most beneficial manner. The residents of equable climates are not as a rule the hardiest and the most enduring in the struggle for existence; on the contrary those peoples which live in a diversified climate have, other things being equal, made the greatest progress.

*Appearing simultaneously in the Report of the Climate and Crop Service of the Weather Bureau for New Mexico, and in the Bulletin of the Hadley Climatological Laboratory of the University of New Mexico.

Nor do our homes, elegant though they may be, afford the diversity which nature presents. The number of objects are limited and their continual presence in time becomes tiresome. Nature, on the other hand, presents an ever changing aspect—a sort of kaleidoscopic view—which never exactly repeats itself. The healthful influence thus exerted reacts beneficially upon the mind which in turn reacts favorably upon the general health.

Although we cannot attempt a consideration of all the differences between house-living and outdoor-living, we must mention the matter of ventilation. It is true there has been a great improvement in recent years in this respect, but a large majority of houses are ill ventilated and allow the carbon-dioxide and other gases to accumulate, the moisture content to become abnormal, and the heat to be poorly distributed. So important is this matter of ventilation that some writers consider it to be a chief factor in causing humanity's multitude of ills. Dr. Charles Denison, of Denver, believes that phthisis is due almost wholly to deficient ventilation. Many facts could be cited in support of this view, as, e. g., that consumption is rare among country people while it is very common among city residents. The Indians of the plains rarely suffer from phthisis, while their civilized brothers who have taken to houses and villages are most susceptible to the malady. The negro in his African home is said to be quite free from tuberculosis, but in our large cities becomes the prey of the tubercle bacillus.

It ought not to be necessary to dwell upon the advantages that outdoor life possesses over indoor life. The fact remains, however, that many of the invalids who annually visit the Southwest (and it is for them that this paper is written) do not adequately appreciate this all important factor. Instead of enjoying country life, they cluster in the towns; instead of living in the open air, they remain shut up in stuffy rooms; instead of profiting by the climate they have sought, they frequently take great pains to close it out of their new homes.

In our present state of knowledge we cannot say exactly how climate produces its effects. We do know, howev-

er, that pure air and sunlight are powerful hygienic factors; that altitude is a natural but powerful stimulant; and that dry air is favorable to healing. It is these and other climatic factors which turn the course of a disease that is rapidly leading its victim to a premature grave. It follows, therefore, that if a climate is to be of the greatest service, it must present the greatest possible opportunity for profiting by these factors, or for outdoor living.

The factors of one climate are probably the same as those of any other, merely varying in degree. It is the intensity of certain factors which constitute the virtue of a given climate. To profit by this intensity we must give it the fullest opportunity to influence us. This is possible only when the conditions for outdoor life are most favorable. Let us then consider some of the factors which render outdoor existence in New Mexico not only possible but highly agreeable.

1. *Temperature.*—Since January, 1893, the Weather Bureau connected with the University has been accumulating valuable data. Most of the observations have been taken by Mr. M. Custers. The data for the first eight years have been tabulated and certain portions of these are presented in Table I below:

TABLE I.—*Meteorological Data 1893-1900.*

MONTH	TEMPERATURE			Precipita- (in inches)	Clear Days
	Abs. Max.	Abs. Min.	Mean		
January.....	61	0	33.8	.48	18.7
February.....	70	-10	37.7	.31	16.3
March.....	80	17	46.83	.26	19.3
April.....	83	13	55.35	.29	18.2
May.....	95	30	64.6	.76	18.4
June.....	104	43	75.2	.39	16.7
July.....	104	48	76.5	1.53	11.2
August.....	94	51	74.5	1.05	12.5
September.....	83	38	67.4	1.12	25
October.....	82	24	55.39	.71	21
November.....	71	10	43	.32	23
December.....	60	3	32.21	.28	18
Total, year.....				7.50	218.3
Average, month.....				.62	18.2

That we enjoy an unusually fine temperature is shown by the table. The winters are just cold enough to be bracing, thus furnishing the best conditions for the physiological activities of the body.

The coldest month is January, with a mean temperature of 33.8 degrees. The lowest temperature occurred in February, 1895, when, on the 14th and 16th, the mercury fell to 10 and 7 degrees below zero. This is the only time when the temperature fell below zero. These cold snaps are simply the touches of the frightful cold waves of the northern states.

Nor are the summers hot. This is readily accounted for by the considerable altitude of 5,000 feet, and by the dryness of the atmosphere. June and July are the warmest months. Three times in nine years has the thermometer reached 100 degrees, the highest point being 104. When it is remembered that the sensible temperature, due to the dry atmosphere, is much lower than the actual, it is seen that New Mexico possesses a very favorable summer climate.

The springs are apt to be marred by high winds and dust storms. These render outdoor life unpleasant and occasionally impossible. While this season is not so favorable to tuberculous cases, it does not appear from data we have collected that the windy season is markedly unfavorable save in highly sensitive cases.

Autumn is the most delightful season of the year, presenting an almost ideal temperature, with little rain and practically no high winds. During this season the greatest progress is made by invalids, and it is greatly to be regretted that this fact is not more generally appreciated.

2. *Precipitation.*—The subject of rainfall merits a fuller consideration than can be given in this place, and it is reserved for another paper. That it touches the invalid's welfare most closely is well known. When rainy weather prevails, the patient's courage sinks and his progress is interrupted. With the return of a cloudless sky there comes a return of hope. So close is this connection that we can almost consider it a law, that the invalid's hopes and progress vary inversely with the rainfall.

The average annual rainfall of $7\frac{1}{2}$ inches speaks volumes for the dryness of the climate. With practically no snow, and the rain falling mostly in heavy showers, there

are few days in the year when outdoor life is not only possible but very highly enjoyable.

3. *Soil Moisture.*—A most interesting study undertaken at the Hadley Climatological Laboratory is that of soil moisture. This work has been carried on by my colleague, Dr. C. E. Magnusson, who has prepared a separate paper on this subject. From data accumulated the following have been selected:

TABLE II.—Showing Moisture Content of Soil.

DATE	PLACE	Character of Soil	DEPTH Inches	MOISTURE Per Cent.
Dec. 28, 1899.....	River Bottoms.....	Sandy.....	8	30.9
Dec. 28, 1899.....	Highlands.....	".....	8	1.9
Dec. 28, 1899.....	Mesa.....	Clay.....	8	3.9
Dec. 10, 1901.....	".....	".....	4	8.5
Dec. 10, 1901.....	".....	".....	10	10.2
Dec. 10, 1901.....	".....	".....	36	4.6
May 2, 1902.....	".....	".....	4	5.4
May 2, 1902.....	".....	".....	10	7.2
May 2, 1902.....	".....	".....	36	4.8

When it is remembered that arable land contains from 20 to 40 per cent of moisture, it is seen how very dry our soil really is. If time and space permitted it would be interesting to show how the low moisture content of both our soil and atmosphere accounts for the wonderful character of the climate. It is this factor which gives us our crystal clear atmosphere and our flood of sunshine. It renders outdoor life a genuine pleasure which is so highly profitable to the invalid.

4. *Clear Days.*—As may be seen from Table I, the average number of clear days per year is 218. This is truly a wonderful showing. A climate may possess sterling virtues otherwise, but when the sky is overcast and the wind feels raw, one is apt to take outdoor life with some compunction of feelings. The benefit to be derived under such circumstances are apt to be slight. But when the sun shines bright and an unclouded sky invites one to pleasure or recreation without, then the temptation becomes irresistible. Then nature is a balm whose soothing and healing influences work magic.

5. *Time Available for Outdoor Life.*—The crucial test of a climate for outdoor recreation is found in the amount of time that can be actually spent in the open

air. At the beginning of the year 1902, Dr. Henry and Mr. Hauschild, both sympathetic friends of the Hadley Laboratory, began a daily record of the actual time spent in the open air. Dr. Henry lost considerable time through illness when he was confined to his bed. The writer also kept a careful record, but it was necessary to make an estimate of the available time at the close of each day. The data are summarized as follows:

TABLE III.—Showing Time Available for Outdoor Life.

MONTH	By Dr. Henry*	By Mr. Hauschild	By the Writer
January.....	84½ hours	257 hours	211½ hours
February.....	172 "	260 "	201½ "
March.....	201½ "	305 "	210½ "
April.....	352½ "	308 "	303½ "
Average per day.....	6½ hours	9½ hours	7¾ hours

*Lost 23 days by illness.

It need scarcely be said that the four months, January to May, comprise the period in the year when the entire time is not suitable for outdoor life. These months embrace the cold weather and the dust storms, and so the record for them is exceedingly valuable. No record is kept for the remaining months, since a failure to spend the entire day, with rare exceptions, in the open air is one of choice and not of necessity.

From the data presented it is seen that New Mexico possesses a truly remarkable climate. Practically the entire time is available for outdoor life, and if tent-life is included, no exception need be made even for the winter months. If tent-life is adopted, certain precautions are necessary on the part of the invalid. A stove and plenty of warm bedding are absolutely necessary, and hot water bottles and similar devices are highly desirable. The tent should be substantially fastened so as to prevent flapping in the wind and thus become annoying or prevent sleep. A well laid board floor is important, and when covered by rugs is even more suitable. It is a pleasure to note that the use of tents is rapidly increasing.

If living in rooms and houses is practiced these can, and should be, vacated during the day-time when the time is spent in the open air. At night the doors or windows,

or preferably both, should be left open, and the temperature of the room maintained by artificial heat. It is scarcely necessary to say that under all circumstances the invalid should wear plenty of warm clothing during the cooler months of the year.

During the summer time it becomes necessary to resort to the shade. This can be provided in many ways. The veranda is always available, trees are frequently afforded, and artificial or temporary structures may be provided at will. The most effective structure, and at the same time affording proper atmospheric circulation, is obtained from an open hall way such as is found in many of the native adobe houses. The adobe roof prevents the penetration of the sun's heat, and the shade affords a delightful coolness.

Whenever possible it is desirable to seek the mountain resorts during the summer months. Mountain life affords a highly agreeable diversion, and the cooler temperature insures rest and sleep. The opportunities for study and for sport, which serve to divert the mind, need scarcely be pointed out.

That more equable climates can be found than that of New Mexico is certain. That warmer winter climates or cooler summer climates are available is equally true. But it will indeed be difficult to find an all-round, all-year climate which at the same time affords so many of the desirable factors required by the invalid, viz., an abundance of sunshine, a dry atmosphere, plenty of pure air, and a considerable altitude.