

very strong joints are being acted upon by moderately strong, very strong or the strongest influences respectively.

(5) With very strong resistances and transitory causes acting there are rarely produced arthritic lesions except during the course of extremely severe infectious fevers. Joint symptoms, then, are mild and of brief duration.

(6) With very strong resistances and causes acting for a prolonged period there are no arthritic changes until the health of such patients is broken down and the joints succumb as the individual's general resistance diminishes and invading micro-organisms gain mastery in terminal infections.

(7) Bacteria lodging in joints develop, or fail to do so, according as joint resistance and the resistance due to protective properties of the blood combined are less, or greater than, the vitality of the parasitic micro-organisms. Three factors enter into the combination, namely, joint tissue resistances which may be strong or weak; protective reactions of the blood which may be strong or weak; and invading bacteria which may have heightened or weakened resistance. Tabulation of all possibilities is complicated and too confusing to be attempted, yet all bear upon the understanding of arthritis and indirectly upon preventive measures.

It can be seen from what has just been pointed out so tediously that first symptoms of arthritic trouble may be slight and transitory, yet possibilities for curing the joint disease may have already passed, owing to origin of the joint lesions being in chronic diseases of other organs that already are beyond hope of cure.

On the other hand, the onset of a very severe arthritis may be followed by speedy, complete permanent recovery, and between these two extremes lie a great many possibilities. Some types are remediable if prompt attention is given to them, and on account of the prolonged course joint diseases may take with years of crippled existence, there should be more stress laid upon the advantages of early diagnosis and treatment.

Obstinate incurable diseases in other organs occasionally may be modified sufficiently to alter blood conditions enough to restore healthy joint balance for a considerable time and to give the individual very appreciable relief; and in other instances underlying causes may be just at the limits from which restoration of health is possible. Prompt attention, then, will turn the course towards recovery instead of incurability. The advantages of preventing disorganization of joint structures with their scanty powers of repair, by quick interference, are obvious even though it may be possible to remove underlying causes later completely.

Prognosis before onset of joint symptoms sometimes can be roughly estimated from personal histories. Those persons who have suffered from various diseases known to cause arthritis and who have escaped entirely from having joint symptoms in severe illness presumably have relatively resistant joints, while those who have had arthritic symptoms coming on during the course of fevers, or have had acute articular rheumatism, should be considered to have relatively susceptible ones and should be advised how to avoid conditions known to precipitate attacks of arthritis.

RÉSUMÉ.

Reasons and data have been given to show how greater accuracy in diagnosis; greater skill in applying remedies accurately according to physiological needs of the tissues; discoveries of new methods of treatment through development of many medical researches; improvements in surgical knowledge and skill; and more keen appreciation of the advantages of preventive measures will all favorably influence progress in treatment of chronic arthritis. Simultaneously with increase in efficiency of such treatments there will develop greater confidence among patients with regard to medical understanding of joint diseases, and this of itself will be an additional advantage, if existing practices that are so fatal to satisfactory results can be minimized, namely, the habit which patients have of wandering from one physician to another trying indiscriminately many cures until hope of recovery has passed and their joints are worn out and damaged beyond repair while attempting to restore their normal function.

HUMIDITY AND HEALTH.

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As a boy I used to enjoy "staying round" the kitchen after studying in my own room. Often since then have I tried to analyze this boyish liking. Was it due merely to the change of surroundings, the simple companionship, or to the pleasant excitement of what was going on? To be sure, my eyes were rested from their books, my ears were entertained and my mind relaxed by the homely discussions of that part of the house; moreover the "smells" aroused other sensations common to growing youth. Even now I experience like refreshment in going to the kitchen, and I have come to the conclusion that this partiality for the kitchen, rather than the study, was largely due to the contrast in the air of the two rooms. The study was probably dry, whereas in the kitchen the steam from the tea-kettle and the water evaporating from the cooking softened the air and gave an agreeable feeling to the skin.

I was annoyed by drying and cracking of the lips, and remembered especially how sore they often were on cold winter days in a country church. Evidently this was due to the variety of atmospheric conditions through which I passed. Before leaving home I would have spent most of the morning in the kitchen. The change was very marked from the warm moist air there, and the cold moist outside air immediately following, to the air of the church, where moisture was all sucked out by the *rapid heating* of the cold building. The contrast of moisture and dryness following close upon that of heat and cold was so sharp as to irritate the lips which are highly sensitive, and left them cracked and sore.

Later, on moving from the Central West to a dry northern state, I found the atmosphere trying. The skin often had a parched feeling, and the

dryness of the lips was a constant annoyance. This effect was so marked that after four years I felt I must get away to a moister climate. I had a sense of nervous tension and dreaded passing another winter in the state. Early in December came my opportunity to move away, and on my journey eastward I spent a day in Chicago. As I walked along the lake front the "feel" of the cold, wet air, raw though it was, was one of the most refreshing sensations I ever experienced. I then realized that the improvement I had felt throughout the day was due to the presence of an increase of moisture in the air. In less than two weeks after my arrival on the Atlantic coast I gained ten pounds in weight. Of course the change in surroundings and of food, and the stimulus of new conditions, had much to do with this improvement, but something about the climatic change was certainly a strong contributing factor.

Women appreciate the effect of climate upon the skin and complain that residence in certain localities is hard on their complexions. A literary man, after a year of residence in an arid state, quite shocked his friends upon his arrival in an Eastern city by the way he stared at the women he passed on the street. He seemed almost dazzled by the difference between these faces and the parched faces of the women in the region he had left. The remarks of this man, with his trained sense of observation, were both entertaining and illuminating. He was surprised to find himself "surrounded by such young women; women where I've just come from are so much older than women of the same age here." He had come from a region where the annual rainfall was ten inches to one where it was four times as great, and the air had on this account a much higher percentage of moisture, or, more technically, a "higher humidity."

If the average person were asked to define the term "humidity" the chances are that he would find that he had never held a very clear idea of its meaning. In the popular mind only, the discomfort felt on hot, close days is associated with this word. The impression may be gained that humidity is something to be deplored, but, properly speaking, a better term would be sultriness. For this means a high percentage of moisture along with excessive heat. On days when the temperature is not high, the amount of humidity may be the very cause of the agreeableness of the air. During the summer when the days are hot and dry, the freshness of the morning and the soothing coolness of the evening are enjoyable, not only because the heat is diminished, but also because the air is tempered with a higher proportion of moisture. If we substitute for the word "humidity" the phrase "moisture in the air" we shall know better what is meant. Air has power to absorb moisture, just as water has power to dissolve salt. Humidity is the measure of the absorption. This will vary partly according to changes in temperature and partly, also, according to changes in atmospheric pressure; the latter factor, however, is of somewhat less impor-

tance and should have its own special consideration. The great point to be remembered in regard to humidity is that the warmer the air, the greater is its capacity and demand for moisture. A homely application of this is the hanging of clothes to dry before the fire, where the heated air rapidly absorbs water from them.

ABSOLUTE AND RELATIVE HUMIDITY.

The term "humidity" is further puzzling because it is used in two senses. We speak of both "absolute" and "relative humidity." Absolute humidity has reference to the actual or absolute amount of water in the air per cubic foot at a given time. For example, when my room contains an actual or absolute amount of moisture of 8 gr. per cubic foot, its absolute humidity is 8 gr. Relative humidity means the percentage of water in the air at any time as compared to the total amount which the air could hold at that temperature without some form of precipitation such as dew or rain. Eight grains per cubic foot is as much as the air can hold in gaseous forms at a temperature of 70° F. So, then, if my room having an absolute humidity of 8 gr. is at 70° temperature, its relative humidity is 100%. If the air in the room should fall below 70°, moisture would gather on the walls and furniture because the colder air could not hold so much moisture. The humidity would still remain 100%; that is, the air will continue to hold all the water it can retain. If the temperature rises, the power of the air to hold water increases, so that its relative humidity is no longer 100%, though its absolute humidity may remain the same. Air at 18° holds, at the point of saturation, only one grain of water; at this temperature the one grain gives it a relative humidity of 100%.

Now if a heated flat in winter be at a temperature of 70°, and the absolute humidity, or amount of water held in suspension, be the same as in the air outside where the temperature is only 18°, the relative humidity there will be only one eighth, or 12½%, and that only providing our air outside be saturated with moisture, which often is not the case. If the air outside, at a temperature of 18°, have an absolute humidity of but half a grain, then its relative humidity will be only 50%; and the air inside, though having the same absolute humidity, may have, by reason of its higher temperature, a relative humidity of only 6¼%. If we reflect that a humidity of from 60 to 75% is none too much for average conditions of human life, we can realize how far below normal is the air in which most of us are housed during the winter. As a matter of fact, various tests of air in schoolrooms, hospitals and living rooms during the winter time have been made here and there throughout the country; these show that the humidity often went below 40%, and upon occasion got down below 10%.

Under such conditions indoor air in winter is very dry and irritating. This is one of the prime causes of chapped hands and parched lips; and we now begin to see reasons for the boasted fresh complexion and coloring of English women

and the women of our own seaboard cities, where there is less confinement indoors and a moister air out. This is one reason at least why Portland, Ore., and the southern coast cities are famed for the lovely complexions of their women. This beneficial effect of moist air upon the complexion should make the practice of sleeping outdoors even more alluring.

OUT-OF-DOOR CONDITIONS.

As we have shown, the warmer the air the greater its capacity to hold water. It follows that cooling the air decreases its capacity to hold water in a gaseous form. A pitcher of ice water will so chill the air about it that drops of moisture will be deposited upon its surface. The amount of dew during the night is governed not simply by the amount of moisture actually in the air, but also by the range of fall in temperature. As the sun rises and the day gets warmer, water is drawn up from any surface from which it can be evaporated. Ordinarily the ground is continually giving out moisture. The surfaces of lakes, rivers and other bodies of water yield it of course even more freely. Moreover, trees, leaves, grass and vegetation are a large part water and present an extensive surface over which evaporation may continually take place. Even in the sandy desert there is water if one digs far enough. The dryness of the air is due to the fact that the sun's warmth cannot reach the water to draw it up through the deep sand.

Of the plants, too, some evaporate through their leaves more rapidly than others. This is partly because of the greater surface exposed to air and sun. The potato plant presents a greater leaf surface than does the cactus and must consequently be grown where it can draw much more moisture from the soil. Evergreen trees, as a rule, do not present so much evaporating surface as do the deciduous trees; moreover, the pitchy nature of the needle of the evergreen prevents as rapid evaporation as that, for instance, from the oak leaf. Evaporation is a cooling process, and this may explain why in summer one finds more relief from the heat under an oak than under a pine-tree; the latter has much less evaporating capacity, and, as we might expect, will grow in sandier soil. Good evaporating surfaces, however, are the rule out-of-doors; to this is due, in large measure, the healthful condition of the open air.

HUMIDITY IN BUILDINGS.

One of the problems of building is to make indoor conditions as regards humidity more nearly like those out-of-doors. Methods for charging air with moisture, that is, for raising the humidity, in buildings are still in the experimental stage. The water used in connection with furnaces and other heating apparatus gives a slight increase, but the problem of how to obtain vaporization, and of how then to control and distribute evenly the moisture so generated, is most difficult.

Some years ago an experiment was tried in a large city office building to increase the moisture

of the atmosphere. Throughout the building tests of the air were made to find the percentage of humidity. It was found that the air of the rooms was dryer at times than that of the driest parts of Arizona. The building was comparatively new and had the ordinary facilities for throwing moisture into the air through its heating apparatus, but a special device was now installed for greatly increasing the amount of moisture in the air. The outcome of the experiment was highly encouraging. The result was true economy in two ways: less fuel was required in the heating of the building and the employees lost less time from their work. The saving as to heat arose from the fact that the ordinary person is more comfortable at a temperature of 65 when the air is moist than at 70 when it is dry. For dry air chills the body with the rapid evaporation of moisture from its surface. The saving of time was due to the employees being less subject to affections of the nose, throat and lungs than previously when the air was dryer and more irritating.

This experiment struck me with peculiar force and stimulated my interest in this problem of the regulation of moisture in buildings. I have since made experiments to improve the moisture quality of the air in different rooms. When the building was heated by furnace, a dish of water was kept over the register. A muffin tin was used for this purpose, as its form presents an exceptionally large surface below for the heat to strike and, therefore, increases evaporation. The muffin tin had to be filled much oftener when cloth was hung over it so that the water was sucked up into the meshes by capillary force, thus increasing the evaporating surface. I have found wet towels or newspapers, too, spread about the room somewhat helpful in moistening the air, but it proved difficult by such means to increase the humidity above 5 or 10%. This, however, was enough to give a sense of increased comfort, for our delicate tissues respond to even such slight favoring changes.

Closing the register at night lowers the temperature of the room and, therefore, lessens the amount of moisture required for comfort. Merely in the condition of one's throat in the morning one would find ample warrant for the shutting off of the heat at night.

Plants have already been spoken of as agents in the general evaporation that goes on out-of-doors. House plants, as might be expected, tend to soften the air. Water exudes rapidly by way of the leaves and stalks and also from the flower pots if these be porous. Thus, directly and indirectly, they furnish a good deal of moisture to the room. One can readily verify this by stepping into a florist's shop on a dry winter day. He will be struck at once by the soft feeling of the air. The part which porous flower pots play must not be overlooked. A milk bottle full of water was set in the living room near the ceiling where the temperature was, of course, very high. Evaporation through the large neck of the bottle was very slow; there was little change from month

to month. Along side the bottle was placed an ordinary four-inch flower pot filled with water. During hot, dry periods the water in this was dissipated so rapidly that it had to be filled every two or three days. This was because the porous surface favored evaporation.

MEASURING HUMIDITY.

For practical purposes it is necessary to find some reliable method of measuring humidity. We have noted that evaporation is a cooling process. By measuring the cooling and making sure that this is due to evaporation, we may determine the moisture of the air. The bulb of a thermometer which carries over it a hood of cloth, the free end of which dips down into a tube of water, has, in fact, a thin sheet of water constantly surrounding it, since the threads of the cloth continually draw up water by capillary action. This thermometer will register lower than one alongside it which has not such a surrounding coat of water, but is directly exposed to the air; unless the air is saturated with moisture, in which case the two thermometers will read alike. By the use of two such thermometers set alongside each other, the humidity of the air may be estimated. This is known as "the wet and dry bulb method." The readings of the two vary according to the dryness and the heat. The hotter and dryer it is, the more they will vary. The instrument I have used, the Hygrodeik, has these thermometers set up on a standard. Between the two is a scale chart whereon, by means of a movable pointer, when the readings of the two are known, both the relative and absolute humidity can be conveniently determined.

This instrument has been productive of very illuminating comparisons of the atmosphere from day to day. It has tallied so accurately with my personal sensations that it has given me a greater respect for one's semi-instinctive perceptions. It has served to verify the experiments of others who have found the humidity low in heated buildings during the winter. The relative humidity was found to be often from 10 to 50% lower indoors than out during the winter months.

Experiments were made one winter day which furnished data for some significant comparisons. In a bank building with eight persons and a few potted palms present the relative humidity was 35%. A hotel lobby with an open fireplace showed a humidity of 45%. In the small offices of a charity society heated by stoves the humidity was 45%. In a restaurant where the floor was being mopped, where three urns were steaming and food and fruit were set out on the counters, and about fifteen people were present, all giving off moisture, the humidity was 65%. In a street car which had been filled and refilled with people several times that cold morning so that the windows were deeply frosted by their breath, the humidity was 60%. In an enclosed fruit stand, where the temperature was low and much fruit was set about, the humidity was up to 80%. In a florist's shop the humidity was highest of all, 84%. As the temperature was high, 73°,

the absolute humidity or actual amount of water held in suspension was considerable, namely, $7\frac{1}{2}$ gr. per cubic foot. The most the air could hold at that temperature would be $8\frac{3}{4}$ gr.; a drop in the temperature of $3\frac{1}{2}^{\circ}$ would have caused precipitation. Florists' windows in winter are, indeed, often beautifully frosted by the moisture which has thus gathered on the panes only to be frozen by the cold outside air. The outside air was gauged to be between 65 and 80% and the temperature around 15° . There would have been, therefore, an absolute humidity outdoors of about $\frac{1}{2}$ gr. These latter instances cited are far from suggesting desirable living conditions; but to such as they we must have recourse if we wish for illustrations of high humidity in typical every-day life.

How rapidly moisture is dissipated is illustrated by another observation. The air in a suite in a hotel showed a relative humidity of 35%. The Hygrodeik was placed on a stand in the bathroom and steaming hot water turned on into the tub. The relative humidity rose to 70%, but would go no higher until the door leading from the bath-room to the rest of the apartment was shut, whereupon it rose rapidly to saturation point. As long as the door remained open the steam-heated air of the bath-room was drawn out rapidly into the rest of the apartment. That is, the moisture was rapidly dissipated and so did not increase above a certain proportion. When the door was closed there was practically no outlet for the vapor and moisture saturated the air. If humidity is here something so fugitive and volatile, one can see that what seems to promise only ordinary humidity may easily fall short of even this expectation.

HOUSES IN SUMMER AND WINTER.

A house, even if it has been dried out by the heat of stove or furnace in winter, absorbs during the summer months, when both the absolute and relative humidity are high, more or less moisture. Coming into such a house on a dry day, one notices its chill, its dampness and possibly mustiness. The air in such a house, it is true, may be unhygienic. Dampness favors certain putrefactive and fermentative changes, and, therefore, promotes the creation of unhealthful odors and may favor the multiplication of germs, but the air outside, with an equal amount of moisture, would not be considered unhealthful. It is rather the closeness of the house, which retains these poisonous elements, than simply its dampness, which makes it unhealthful. It is not the presence of moisture, but the lack of sun and wind and other outdoor elements, which is responsible for the unwholesome smell of closed rooms. The air outside is, ordinarily, well supplied with moisture, but it is constantly in motion and permeated with pleasant odors due to the regeneration of growth and new life. Surfaces indoors with the best of care are apt to retain dust and shreds and various kinds of dirt, and the odors which go with them. These unpleasant odors carry to the sensitive nostril suggestions of un-

healthfulness. But if a well-situated house is kept ordinarily clean and in good condition the petty effects of the dampness which comes from the outside air should not be allowed to outweigh the maintenance of a good tone of the skin and the delicate tissues by means of adequate moisture, — a matter of first importance. As a matter of fact, little of this moisture is likely to be in evidence in a house with artificial heat; the tendency is all the other way. An evidence of how moisture is carried off by means of heat is seen in the way the floor boards of a house shrink after the fires are started in the fall. The cracks widen between the boards, which have been absorbing moisture and swelling during the summer.

IMPORTANCE OF MOISTURE IN THE ARTS.

We have already spoken of the importance of moisture in the atmosphere, of its being essential to personal comfort, but its effects take also more visible and material form. On the shelves reserved for new books at the library my curiosity was one day aroused by the title "Air Conditioning." The book proved to be a discussion of the atmospheric conditions necessary to the manufacture of certain delicate fabrics. In the factories where these cloths and other textiles are made, particular attention is paid to the percentage of moisture in the air, since this has a marked influence upon the fine threads and fibers used in the weaving and knitting. Indeed, so important is this moistening of the air that special vaporizing apparatus is commonly installed in textile mills to create additional moisture in the rooms where the weaving goes on.

The importance of moisture applies not only to the mechanic arts, but also to the fine arts. It is only recently that there has been any extended recognition of the importance of regulating the moisture in public and private buildings in order to preserve delicate surfaces, fabrics and parchments. The custodians of art museums have been puzzled to know how to grade the atmosphere where precious curios and works of art are stored. Oil paintings and their frames have suffered by cracking in the dry heated rooms in winter. The alternate extremes of dryness and moisture which it seems almost impossible to avoid in our climate work particular havoc upon costly fabrics and tapestries. Books in libraries have suffered under similar atmospheric conditions; the bindings shrivel and break.

HYGIENIC IMPORTANCE OF MOISTURE.

Ordinary fabrics are dependent upon a high degree of moisture during their manufacture; works of art are sensitive to the wear and tear of climate; book bindings suffer from dry air. What, then, must be the effect of such air upon the delicate tissues of the body and upon its binding, the skin? Should not the subject of humidity, as it affects human beings, be made more prominent in the field of hygiene? Are not the skin and the delicate linings of the eyes, nose, mouth and throat, as important textures, being

the living covering of the body, as are the manufactured coverings? In both the child and adult, the eyes, the nose, the throat and the entire skin are more affected by atmospheric conditions than we commonly realize. The tissues of the growing child, especially, are, during certain years, extremely sensitive. Our modern mothers wrap their babies up and let them stay for hours in the "health-giving, pure, outside air." "The fresh air is so good for them!" This is good as far as it goes. But more attention must be given to the atmosphere inside to which the babies return. Their tender skins do not take kindly to the sudden shifting from one to the other. There is too great a contrast between the moisture outside and the dryness within. This in a measure accounts for the prevalence of chapped cheeks and running noses.

If one gets a clear view of this line of thought, he will better understand the marked changes that take place over the surface of the body. A man with a rheumatic knee finds this a sort of barometer. He anticipates the approaching storm by the twinges in the affected member. A common treatment for such a joint, particularly in an extreme case, is to bake it in an oven in the hope that the stimulation of the skin by the dryness and heat may produce some favorable influence upon the soreness of the part. Rheumatism is an ailment which is particularly susceptible to moisture. The sensitive knee is keyed up so that it forecasts any slight increase in humidity.

Some throat conditions are equally susceptible to excessive moisture. An elevator boy with a chronic weak throat, I remember, complained on rainy days of great discomfort. On dry days the congestion about his throat was favorably counteracted in a measure by the activity of the skin. A sudden change to very moist air interfered with that activity. On the other hand, moderate changes from day to day are likely to have a beneficial effect. A man whose work had previously kept him for hours at a time steadily in one room remarked how much better his throat felt when a change of work took him now indoors, now out, through the winter. He had found the degree of change that was good for him personally. This appropriate personal degree of change is the important thing in altering unsatisfactory conditions, and our finer sensibilities can be nursed to decide the proper course for us.

Persons who live in valleys or near the sea where there is considerable moisture are often advised to go to the mountains or to the dryer plains either for a vacation or for extended residence. For some the change from a moist to a dryer air may prove stimulating and produce favorable results. Others, probably of a more nervous type, would be benefited by the opposite change, — from a dry to a moist climate. For them a dry climate would probably draw the moisture too rapidly from the skin and so be over-stimulating. The skin can be worked too hard, and as the skin is closely related to the nervous system, whatever tends to give the skin an easier time has a favorable influence upon the

whole nervous tone. In general, under our conditions of indoor life we suffer from too little humidity rather than too much.

GENERAL CONSIDERATIONS.

Attention should certainly be paid to the tone of so incessantly and vitally functioning a part as the skin. And the skin has specific needs. It may be over-irritated, it may be under-stimulated or it may fail to enjoy sufficient change in the air or clothing touching it. If dryness irritates the skin or the delicate tissues in nose, throat or lungs, the resulting over-stimulation tends in time to render such tissues a prey to the disease germs which we know are found in our water, milk, air and in everything we touch. These germs get a better grip on tissue which is over-worked and so in a state of reduced vitality. This, therefore, accounts for much adenoid and tonsillar trouble. We all want normal healthy fighting tissues.

A man has a right to be protected from evil agencies, such as disease germs, but evil surroundings, such as bad atmospheric conditions, may play a part in the mischief as great as that of the disease germs, and from such conditions he should also be protected. Thus will man be not merely more or less imperfectly separated from disease organisms, but positively fortified against them. The exhaustive research to discover pathological germs and to assign them as causes for this or that disease or infection has its place, but in the future greater attention must be paid to whatever is devitalizing or depressing.

Moreover, the constant fear and worry induced by hearing so much of bacteria, microbes, serum and antitoxins may even jeopardize our health. The complication theories involved in understanding these invisible foes, first and last, are very difficult; what we must learn is how to use the resistive agencies which each one has at his command. The natural instincts of self-defense are very frequently well founded and often given too little encouragement. A childish impulse may lead us to do just the right thing, and the whole aim of such an article as this is both to encourage each individual and to suggest how to use the forces at his command.

Outside influence sometimes overrules too far the expression of natural impulse. Of two boys studying at a table, one, feeling a draft, will get up and move away. The other, who has probably been over-drilled with the idea of diligence in keeping at his work, may not be aware of the draft until after he has "caught cold." Education at the expense of such instincts of self-preservation is too dearly bought.

But does a person really "catch cold"? It might be well to call attention to the reason why drafts are dangerous. One portion of the body is chilled, either by the coldness of the wind or because of the rapid evaporation from the surface of the body, evaporation, as we have shown, being a chilling process. The body might stand a greater chilling if its whole surface was exposed at once to wind and cold. But ordinarily a draft

strikes but one part of the body and that part is thereby over-stimulated, so that a blood congestion occurs at some points of the least resistance in the body. Outdoor sleepers with little protection from wind and weather seldom complain of colds, whereas those who sleep inside near any kind of a draft frequently do take cold. A draft is more dangerous than all outdoors; so far fresh air ideas must compromise with old notions.

Dryness causes a certain amount of activity of the skin by rapid evaporation; wind, too, removes moist air rapidly and so favors evaporation. Therefore wind or dryness may tend to over-exercise and, therefore, to fatigue the skin. Hence in dry or windy climates the skin may find frequent or long-continued changes to moist air grateful. It may, on the other hand, be under-exercised and need toning up by the stimulation of dry air. Whatever changes of humidity improve the tone of these tissues will increase the resisting power of the whole body. The best fighting condition should be demanded of all the tissues. Feeble tissue invites germs. It should be our ideal to make the body, as it were, a fire-proof structure where inflammable material shall be reduced to a minimum.

PRACTICAL SUGGESTIONS.

All need change of air. The vacation idea is sound at bottom. Whenever we do not know what else is the matter with us, there is wisdom in trying what a change of climate or even a change of room will do. People on the seacoast where the air is moist, may suffer from too much humidity. The residents of Boston, Brooklyn and Baltimore, for instance, prefer to spend their summers in the mountains, where the humidity is less. Those who live in winter in dry offices and apartments appreciate the soft, moist air of Atlantic City and southern watering places. That which is seen is usually thought to be the whole story in the change; but that which is felt is by no means to be neglected. The teacher of the Middle West, kept all winter in a dry schoolroom, does not realize that the rest and soothing to the nerves derived from her summer ocean trip may be in a large measure due to the humidity or soft moisture of the sea air. A "sea change" may do wonders in restoring lost nervous tone. On the other hand, a well-known educator whose home is on the eastern seaboard says she is greatly stimulated mentally by her occasional visits to dry western localities. The skin is favored by this change for a short time from higher to lower humidity.

In cases where a vacation or a change of residence is impracticable, a change of work may be of great benefit. Men and women nervously depleted by days of confinement in dry offices and at other indoor work find help in turning to work that takes them outdoors at least a part of the time. A hospital dietitian found her occupation so confining that she was becoming irritable and losing interest in her work. She had the wisdom to take her case in hand before it became serious. She resolved to get into work that would give her

outdoor air and action; and, having the courage of her convictions, she took the nearest thing that offered, which was an agency for hospital supplies in the large cities. A friend meeting her two months later in a distant city was pleased to note that she had recovered her poise and the fresh coloring for which she had been known as a girl and had regained a normal interest in the day's work and in the life around her. Change of occupation is not always practicable; however, those who are imprisoned daily at their work and cannot escape it may yet do much for themselves by choosing outdoor rather than indoor recreation. During the noon hour they can go to the waterfront or into a florist's shop, if they need moisture. If they need the opposite change, they will find a dryer zone usually upon a hill or at the top of a tall building.

The growing custom of outdoor sleeping has the advantage of subjecting the sleeper to less rapid changes of humidity. The outside air tends to keep more nearly normal; being cooler at night than indoor air, its relative humidity is likely to be higher. Even the walls of a tent may keep out dampness and decrease the humidity. One summer while sleeping in a tent, desiring to get a little more ventilation, I moved the head of the couch outside so that there was no protection over the face, and immediately noticed how much softer the air seemed. The tent canvas had absorbed the dew and shut out most of the moisture.

Living out-of-doors day and night must, of course, benefit persons suffering from tuberculosis, because the changes of air are more even. Their sensitive throats and lungs are not at any time subjected to so much irritating dryness.

CONCLUSIONS.

The problem of constructing buildings in such a way as to keep the interior up to a fair degree of humidity is a large one. So far engineers have made little practical progress toward its solution. Their ingenuity has been taxed to improve the moisture in large public buildings. The devices for this have so far proved too expensive for private dwellings, hotels, offices or schoolhouses. Another difficulty has been to arouse public opinion on the subject, or to convince of its importance. Americans complain of the drafty, poorly heated buildings abroad, but American houses are both too nearly air-tight and too much heated for ideal humidity. Too little of the moist fresh air enters; and this, under the rising temperature, has its relative humidity greatly lowered. The situation calls for some special measures.

It is well simply to call attention to the fact that clothing and covering of the body interferes more or less with an equal shading of humidity and evaporation and circulation of the air directly over the skin. Advantage may be taken of this fact. If the skin is allowed to enjoy longer periods of freedom from clothing upon retiring or rising, or when they are being changed, the body will be bathed more equally by air of a like degree of humidity and should benefit from such

baths. Clothing which permits freer circulation of air is a step in this direction, but this whole subject can be reserved to a later discussion.

If one must live much indoors he may improve the temper of his rooms by various devices, such as keeping growing plants and setting about porous dishes, as flower pots, full of water. If such receptacles are set near electric fans the stirring of the air facilitates evaporation. Some housekeepers have even placed such pots within the radiator.

There are some objections to the use of plants, such as the amount of care they require, the space they occupy and the physiological effects of their odors and gaseous exhalations. Those who love plants, however, may get encouragement from the fact that the beauty and fragrance are joined with a humbler and inconspicuous but very much needed service. Porous vessels, too, demand some care. If they are not covered dust will gather within them, evaporation will be retarded and the water itself will grow foul. The vessels should be covered or closed and the water changed occasionally to keep all fresh. As with plants, the esthetic sense may be satisfied along with the useful. Pottery may be formed to furnish an elaborate amount of evaporating surface and at the same time artistically designed.

After all, there is nothing for humidity like the out-of-doors. Even though the humidity may range from that of parched Arizona to that of the English Channel, it is so admirably adjusted to the environment on nature's gigantic scale, and so likely under the vast majority of conditions to be superior to anything that can be produced artificially, and it is so bound up with advantages of other sorts, that the Great Open must be the common refuge, and to the natural we must turn in our search after the ideal. Conditions indoors may and must be improved; conditions outdoors wait to be enjoyed.

Clinical Department.

A CASE OF PELLAGRA.

BY C. H. DEAN, M.D., NORTHAMPTON, MASS.

THE following case was under observation for several weeks before any diagnosis could be made. It was then recognized as very similar to the described cases of pellagra. No one who saw the case had ever seen a case of pellagra, but we became convinced that that was the condition with which we had to deal.

H. T., male, single, age thirty, laborer, was admitted to the Northampton State Hospital on April 3, 1911. He had been intemperate and was committed as a case of alcoholic insanity. For a year he had been indifferent and disinclined to work. For three days he had been delirious and violent. There had been hallucinations of hearing. It was later learned, from the patient and his brother, that during the summer of 1910 he had suffered from gastritis and had frequently vomited. There had been a similar gastritis, though less severe, during the summer of 1909. They did not remember that there had been any skin affection.