

be lowered, but the vapor tension will be reduced in a much greater ratio so that clouds may form, condensation of vapor will take place and dew be deposited, fog appear or rain fall. So, too, if into a cool atmosphere a warm moisture-bearing wind¹⁴ blows, the same cloud formation and aqueous condensation will take place. And not only is the amount of this precipitation important to health, its daily distribution, that is the frequency of dews or storms, is equally of value.¹⁵

So far, however, am I from maintaining that relative humidity is the most important element in estimating the relations of climate to health, or even a more important element than absolute humidity, that I believe the truth to be that we are not only precipitate in ascribing supreme importance to the weather in the maintenance of health, but too fond of generalizing from weather data that are incomplete and therefore misleading. No *separate* sets of weather, nor all combined, can adequately represent a climate in its health advantages. We must have also data belonging to the geographer, the chemist and the geologist. Life and its influences are not made up of discrete phenomena which can be abstractly discussed apart from every attending circumstance, as can experiments in a physical laboratory, and our daily status is merely the resultant of a vast correlation of conditions which do not and which cannot, in the existing order of affairs, work in any other than a connected manner, dependent the one condition upon the others.

I am not here extolling the advantages of any particular climate or locality, but even were I estimating comparative climatic values, I am sure I should give a place to *relative* as well as to absolute humidity, and *should neglect neither*.¹⁶ Nor am I constructing hypotheses to account for the causation of disease. I have no pet theories to weave into the very texture of my thoughts. I am simply searching after truth wherever it may be found, and can therefore accept as a contribution to my knowledge some sets of data which another might regard as a hindrance to the development of his theory.

As has been said by eminent authority,¹⁷ "it is significant of the state of public knowledge in respect to humidity that local writers use and all interested quote that phrase of humidity which best suits their line of argument." This is no more applicable to enthusiasts praising pet localities as health resorts than it is to scientists who see confirmation of their theories in everything they agree to look at, but who do not agree to look at everything that is before them.

THE COLORADO ATTEMPT TO ESTIMATE HUMIDITY AND CLIMATE.

Of the theory of humidity devised by Dr. Denison of Colorado¹⁸ there is little to say, but that little should be very emphatic. The maps are inherently pernicious in their influence, although their brilliant

colors and the general air of official meteorological authority give them at first blush an apparent but fictitious value. Denver is made a Garden of Eden, but, unfortunately for science and for accuracy, the rating tables¹⁹ upon which the whole climatic theory depends are made by averaging unlike averages, by adding together such unlike data as averages of relative humidity and cloudiness expressed in per cents, and the product of absolute humidity expressed in tenths of grains, multiplied by an average percentage of relative humidity. The process is much like adding apples to pears, and expressing the sum in terms of plums, and there cannot be the slightest shade of reason why the system or the charts should give the least idea of humidity or of climate.

(To be continued.)

A CASE OF HOMICIDE IN WHICH THE LOCATION OF THE POWDER-BRAND ASSISTED IN ESTABLISHING THE INNOCENCE OF THE ACCUSED.¹

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President of the Colorado Board of Medical Examiners.

On October 2, 1884, Dr. D. B. M. Fish, one of the medical examiners for the State of Massachusetts, reported, in the *Boston Medical and Surgical Journal*, a series of experiments by which he had determined the cause of the "brand" in gun-shot wounds. He was furthermore able to deduce, from its position, the manner in which the weapon had been held as regards the direction of the hammer. I report to-day, what is, so far as I have been able to learn by correspondence with Dr. Fish and otherwise, the first application of this knowledge to aid in determining the guilt or innocence of one accused of homicide.

In this case, the deceased, H., was shot through the head by M., and at the examination of the body, a scratch appeared upon the throat, from which slight bleeding had taken place. The daily press reported that M. had deliberately cut his victim's throat and then shot him; and, as a consequence, feeling ran high against the accused.

The scratch was proved to have been made by a fancy hair-pin which M. held in his left hand, he having been in the act of wrapping it up for a lady in the store at the time he was called to the door by his assailant. The brand was found entirely below the wound—an almost inexplicable fact to me at first sight. Then it was learned that, although it was dark at the time of the attack by H., several witnesses stated that M. had been in the act of striking overhanded at H. when the noise of the discharge was heard and the flash seen; but none of these witnesses could see the revolver. The evidence from the brand, showing that the weapon was wrong side up at the

¹ A paper read before the Colorado State Medical Society at its Annual Meeting, June 18, 1890.

¹⁴ By moisture-bearing winds I do not restrict myself necessarily to winds bearing only vapor—they may bear also liquid water in fine suspension.

¹⁵ For the influence of forests upon evaporation and rain-fall, see B. E. Fernow, Chief of Forestry Division, Special Report in Report of Secretary of Agriculture, Washington, 1889, page 297, *et seq.*

¹⁶ In the comparative study, however, of the variations in monthly or seasonal influence upon disease where we already know the general degree of the absolute humidity, I regard changes in relative humidity as of more importance than changes in absolute humidity. See my paper on Phthisis and Pneumonia in Massachusetts, Communications Massachusetts Medical Society, 1888, page 272.

¹⁷ Where shall we spend our winter? Gen. A. W. Greely. Scribner's Magazine, November, 1888, page 606.

¹⁸ Moisture and Dryness; also Annual and Seasonal Climatic Maps of the United States, by Charles Denison, M.D., Denver, Colorado, 1885.

¹⁹ To obtain the "rating mean" of humidity, Dr. Denison estimates the means of the relative humidity records of the Signal Office stations throughout the United States to be 67 per cent.; 67 per cent. of the absolute humidity in tenths of grains is then obtained for every degree of temperature, and the means of Signal Office data of cloudiness are calculated to be 44.5 per cent. One third of this sum gives the "rating mean" for a given temperature, ignoring altogether the dew-point. Compare with this "rating mean" one third of the sum of the actual records given of the above attributes for any place, and the difference, plus or minus, shows the rate of humidity of that place. The only official and valuable portion of this scheme is the actual records of the Signal Office prepared for the Colorado State Medical Society; their distortion is Dr. Denison's idea.

time of discharge, was substantiated by that of the manner in which it had been held in attempting to strike the blow.

It would seem to me that M. never could have been convicted upon the evidence produced, had he deliberately shot his assailant, as the latter had made repeated threats to kill him. However, this evidence, proving absolutely to the jury, as they have since informed me, that M. intended only to strike H. and not to kill him, and very adroitly handled by the attorney for the defence, Mr. Charles L. Allen, of Sterling, Col., assisted materially in making the acquittal a comparatively easy matter, in spite of the fact that the three attorneys for the prosecution attempted to prove that this evidence was of no value whatever. At the trial, several targets showing the location of the brand, with the different positions of the revolver, were shown. There was no evidence introduced in opposition, as the prosecution destroyed the targets they had prepared, for the reason that they were even stronger evidence than those shown by me.

The cause of this phenomenon is briefly this: the point of support of the revolver being below the line of application of the force generated by the burning powder, this force tends to cause the weapon to revolve about the point of support. The gases which impel the ball, being necessarily behind it, follow the new direction of the barrel after the ball has left it, and hence strike above the bullet-hole or to one side or below, as the case may be. In other words, the kick of the weapon does it. The powder stain and smutting may show all about the wound in some cases, but the brand, if distinctly marked, is always found as indicated above. I find that if a revolver be very dirty before the discharge, the old smut is often blown out in front of the ball, and stains on all sides, and thus obscures the point at issue. As proof of this explanation, Dr. Fish shows that, if the pistol be held in a vice, the brand is equally distributed about the bullet-hole, regardless of the position of the weapon, for here there can be no recoil. At a distance of a foot or more, the brand is commonly indistinct or absent. With a Winchester rifle (40, 82, 260), the brand shows very slightly above the wound; and with the left barrel of a No. 10 Colt shot-gun, above and to the left. Here, of course, the line of application of the force passes much nearer the point of support.

It was objected, in this case, that M. might have been in the act of bringing his revolver "down to a drop," as is done by many in the West. Target No. 3 (shown when the article was read) made in this manner, effectually disposes of this idea, as it coincides precisely with the others. It is possible that the weapon might be moved with such rapidity that the brand would appear on the other side of the bullet-hole, being carried by, as it were, but certainly not with the ordinary speed of the hand in such a manner of shooting.

Two matters I wish to mention further. I had the targets prepared by Mr. William H. Gleason, under my direction, before telling him of the object in view, that the jury might not believe that the result was modified by my own shooting. I also made at the examination, for exhibition in court, a drawing of the wound, but would, under similar circumstances in future, recommend that it be photographed.

While, as Dr. Fish states, it would be possible to make a pistol with the centre of gravity in such a

place that this rule would be reversed, in point of fact, he states, none are so made; so that the rule applies universally.

REPORT OF PROGRESS IN GYNECOLOGY.

BY F. H. DAVENPORT, M.D.,
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EFFECT OF THE INFLUENZA ON DISEASE OF THE FEMALE GENITAL ORGANS.

GOTTSCHALK¹ is able from cases which he observed in his own practice, to verify Biermer's statement that, as a result of the influenza, metrorrhagia sometimes occurred, and in cases of amenorrhœa menstruation was re-established.

In four cases, the bleeding occurred either on the first or second day of the disease, was quite profuse, accompanied by backache, and, in two cases, with a frequent desire to urinate. The hemorrhage lasted five to eight days. Examination showed a marked swelling of the uterus and a well-defined softening of the walls, so that they suggested the softening of pregnancy. The mucous membrane was extremely sensitive to the passage of the sound, and softened, but without roughness. The canal was lengthened from one to one and a half centimetres.

The author considers these hemorrhages as caused by an acute inflammation of the uterine mucous membrane, and not of reflex origin from the appendages. As proof of this, he cites a case where, in April, 1889, he had removed the appendages, and the patient had not menstruated since. She came down with the influenza on December 17th, and immediately was taken with uterine hemorrhage, which lasted as long as in the other three cases.

Gottschalk found that pregnant women were as susceptible to the influenza as non-pregnant women. In two cases abortion followed; once at the third month, and once at the fourth. One woman, in the ninth month, had pains for four days, and the os uteri dilated so as to easily admit two fingers, but the pains ceased with the recovery from the influenza. The author thinks that in these last cases an acute inflammation of the uterine mucous membrane or the decidua was present, which, in the first half of pregnancy, easily results in abortion.

Dr. R. Müller gives, in this article² the results of his experience on this subject, from the study of fifty-one cases. His attention was drawn to the occurrence of hemorrhages from the genitals, and his conclusion is that the influenza had a direct causal effect in their production. The flowing occurred during the intermenstrual period, usually in the very first days of the influenza, and was, as a rule, long continued and stubborn to treatment. In those cases which had been previously healthy as regards the genital organs, the flowing came on without subjective symptoms. In those, on the other hand, which had been under treatment for trouble with the sexual apparatus, there were pain in the small of the back, desire to urinate, and a generally worse condition of the old trouble. In both classes of cases he found increased temperature of the vagina, swelling of the cervix and of the uterus, and increased sensitiveness of the latter. The pain, on the gentlest palpation, was often intense. Only once was any trouble found with the appendages.

¹ *Cent. für Gyn.*, No. 3, 1890.

² *Cent. für Gyn.*, No. 17, 1890.