AGUA TIBIA.—Municipality of Taretan, Michoacan, Mexico. This spring discharges a cold sulphureted calcic water. As a bathing medium it has acquired considerable reputation in the treatment of syphilis, although no bathing establishment has been erected.

N. J. Ponce de Léon.

AGUAS CALIENTES.—California. In the southern part of this State are situated a number of thermal springs, known as *Aguas Calientes* (hot waters). Some of them have acquired considerable celebrity. This is especially true of the springs of Coahuila or Cabojos valley, on Warner's Ranch, some fifty miles from San Diego City, in San Diego County. These waters vary in temperature from 58° to 142° F., and are believed by the native population to be an infallible remedy in syphilis and cutaneous affections. Subacute and chronic rheumatism, renal and hepatic disorders, and strumous diseases are also successfully treated here. Accommodations have been provided for visitors. The following analysis was made by Prof. Oscar Loew:

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Sodium carbonate	8.30
Sodium sulphate	Trace.
Sodium chloride	31.00
Calcium	Trace.
Magnesium	Trace.
Lithium	Trace.
Silica	Trace.
Hydrosulphuric acid	Trace.
Organic matter	Trace.
Total	39.30

The examination was evidently not complete. The water undoubtedly contains sulphureted hydrogen gas in considerable quantities.

Another Agua Caliente of some repute is located in Keon County, thirty miles from Caliente station, on the Southern Pacific Railroad. The waters are sulphureted and their temperature varies from 80° to 100° F., but no analysis has been made. There is a small resort at the springs.

James K. Crook.

AIKEN.—South Carolina. This little village is situated in the western portion of the State, seventeen miles from the Georgian line, between the Savannah and Edisto rivers, but at a considerable distance from either; it stands upon the elevated tableland or plateau forming the common water-shed of both. From the Atlantic Ocean, Aiken is distant a little more than a hundred miles in a "bee line." The elevation of the town above sea level is 560 feet. The soil is very sandy, consisting, indeed, of little else than such absolutely pure and unmixed sand as is usually found only upon the immediate borders of the sea. Grass grows but scantily, and the vegetation of the surrounding country is such as characterizes a region possessing a dry, porous soil, and, in consequence, a dry atmosphere. The yellow pine of the South finds here its congenial habitat. Several varieties of oak are also to be found in the woods about Aiken, and many varieties of flowering vines and shrubs; but the pine is the characteristic growth of the country.

The chief factors in producing the healthfulness of this now celebrated resort are the mildness and general equability of its winter climate; the preponderance of bright sunny days, which enable the invalid to pass much of his time in the open air; and last, but by no means the least important, the remarkable dryness of the air, already alluded to, depending upon the peculiar character of the soil and the distance from any large body of water. With the exception of certain stations lying in close proximity to, or west of, the Rocky Mountains, there is no place in the United States which possesses a drier air than that which exists at Aiken.

To demonstrate the small amount of variability in the temperature possessed by the climate of Aiken, the following figures are appended; they are deduced from observations taken by Dr. C. F. McGahan, and embrace a period of seven years.

Month.	Nov.	Dec.	Jan.	Feb.	March.	April.
Daily variation...	13.14	14.57	10.39	12.43	10.25	18.52

Aiken being only a winter resort, Dr. McGahan's observations have been confined to that season which extends from October to May, and therefore the following figures, quoted from "Smithsonian Contributions to Knowledge," No. 277, are here inserted. They show the mean temperature at Aiken for each of the twelve months, for each of the four seasons, and for the year. The observations upon which these figures are based were taken at 7 A.M., 2 P.M., and 9 P.M. (by Messrs. H. W. Ravenel, J. H. Cornish, and Newton), and extended over a period of seventeen years, from January, 1853, to December, 1869.

January	44.15°	July	78.80°	Spring	61.32°
February	47.83°	August	77.19°	Summer	77.36°
March	53.32°	September	72.53°	Autumn	61.90°
April	61.49°	October	61.80°	Winter	45.82°
May	69.25°	November	51.84°	Year	61.61°
June	76.08°	December	45.48°		

The mean relative humidity from October to May 1st, taken from the following tables, is 58.75 per cent. The prevailing winds are from the southwest, and the number of clear days is unusually large.

METEOROLOGICAL RECORD TAKEN AT AIKEN, S. C., BY DR. CHARLES F. MCGAHAN, VOLUNTARY OBSERVER, UNITED STATES SIGNAL SERVICE.—LATITUDE, 33° 32′; LONGITUDE, 81° 34′; ALTITUDE, 565 FEET; PERIOD OF OBSERVATION, 1888–1894.

	Mean Temperature for Months at Hour of			Mean temperature of month $(7+2+9+9)\div 4$.	Mean temperature from maximum and minimum.	Mean barometer.	Direction of prevailing wind.	Mean relative humidity.	Average number of clear days.	Average number of rainy and cloudy days.	Mean rainfall in inches.
	7 A.M.	2 P.M.	9 P.M.								
November	48.33	61.47	52.69	53.54	55.30	29.623	S. W.	59.65	27	3	1.33
December	42.48	57.05	48.02	48.89	50.71	29.540	W. & S. W.	58.58	26	5	2.85
January	41.28	52.67	44.54	45.75	47.87	29.615	N. E.	63.17	23	8	4.68
February	44.41	56.84	49.92	50.27	52.01	29.622	S. W.	60.31	24	4	4.35
March	49.55	59.80	53.36	54.02	52.03	29.494	S. W.	57.90	26	5	6.07
April	57.23	71.78	63.26	58.88	64.33	29.547	S. W.	52.78	29	3	3.33
Mean	.....	.....	.....	51.89	53.70	29.573		58.73			

These observations were taken with United States Signal Service instruments, and according to their regulations; the thermometers being exposed on the north side of the house in the shade, and protected from reflected sun rays.

We possess, then, in this climate all of the attributes of a health resort favorable for the relief of pulmonary tuberculosis, except altitude and its accompaniments—viz., pure dry air at a moderate temperature, a dry and well-drained soil, an absence of high winds with an occasional exception, and an abundance of sunshine. Experience through a long series of years in the treatment of pulmonary tuberculosis at this place verifies this conclusion. In the writer's opinion, the high-altitude climates are superior, as proved so far by results, to those without altitude; but it must nevertheless be borne in mind that not all cases of pulmonary tuberculosis are suitable for the high altitudes, and in such a climate as Aiken we have a most valuable resource for such cases as, from limited vitality or other unfavorable conditions, are unsuitable, at least for a while, for the high altitudes. Here we can surely carry out to perfection the modern open-air treatment, which after all is the essential part of the climatic treatment of pulmonary tuberculosis.

Moreover, the climate of Aiken is suitable for patients who are suffering from other diseases, such as rheumatism and albuminuria; for convalescents from acute diseases or injuries; and for large numbers of individuals who, for one reason or another, possess little physical vigor. Here they can exist in comfort with a minimum expenditure of vital force.

"Malaria," says the late Dr. Geddings, "is remarkable for its absence. During a practice of fifteen years, I have never known a case to originate here."

The water supply is derived from an artesian well which is 780 feet deep, the last 200 feet being through a solid bed of granite. Its purity is attested by an analysis which was made in 1898 by Prof. Charles F. Chandler, of Columbia University, New York.

The system of sewerage is the one that has been tested thoroughly for the past twelve years by the State Board of Health of Massachusetts for its inland towns, and is considered by sanitary engineers the best for such places.

Amusements.—On account of the sandy roads, this is the ideal country for horseback riding; then there are fox hunts for those who are more venturesome. A mile race track is one of the features of the place, and some of the best race horses in the East winter here. The Palmetto Golf Club has the finest links in the South. For those who enjoy the wheel, there is an eight-mile track, perfectly level, running through the woods and fields.

The Highland Park Hotel, which was destroyed by fire in 1898, has not been rebuilt, owing to the opposition of the cottagers, but before another year has elapsed it is confidently expected that Aiken will have as fine a hotel as any resort in the South.

The special feature of the place is the cottage life, and cottages of all sizes can be rented, from the simple three-room cabin to the pretentious villa provided with all the modern improvements. There is a modest family hotel in the town, and there are also numerous boarding-houses.

Any account of Aiken would be incomplete without mention of the Aiken Cottage Sanitarium, founded, in 1896, for the treatment of cases of incipient phthisis. It is a charity, and is modelled after the institution of Dr. Trudeau's, at Saranac Lake. The cottages at present can accommodate only eleven patients, but provision will soon be made for the care of twenty cases. The treatment consists mainly in providing good nourishment and keeping the patients in the open air from seven to nine hours a day. The institution is under the charge of Dr. C. F. McGahan.

The educational advantages of Aiken are very good, there being several excellent junior schools, and a high school which fits its pupils for college. Churches of all denominations are to be found here.

In conclusion it may be added that Aiken is situated upon the Southern Railroad, with three daily trains from New York. For much of the above account the writer is indebted to Dr. McGahan.

Edward O. Otis.

AILANTHUS DESF.—A genus of some seven species, in the family *Simarubaceæ*, native to Eastern Asia and the East Indies, the *A. glandulosa* Desf. common in the Eastern United States. It is in this species that medical interest chiefly centres.

It has been observed that the tree is odious to flies, which, it is said, will not approach even decayed meat when placed among its leaves. Mild poisoning has been recorded from the habitual drinking of water into which the roots of the tree had penetrated, and into which its leaves had fallen. The symptoms were those of simple gastric irritation, similar to what would be caused by the amaroids contained in quassia and similar drugs. The bark and leaves have been used medicinally, and are purgative and anthelmintic.

The constituents of the plant are known only in the most general way. An amaroid, a volatile oil, and a resin are active. The pure resin has been found purgative, but not anthelmintic, while the oleoresin is an efficient tænicide. The tænicidal property is therefore assumed to reside in the dark-green volatile oil. This oil, taken by inhalation, is a powerful depressant poison, producing vomiting, dizziness, and cold perspiration. Taken by the stomach, these effects have not been observed, though due precautions in regard to dosage should be observed.

The dose of the powdered leaves, as a tænicide, is 0.5–2.0 gm. (gr. viij. to xxx.), of the oleoresin 0.2 to 0.6 gm. (gr. iij. to x.).

In India, the juice of the leaves and bark of *A. excelsa* Roxb. have been used from ancient times as a tonic, especially in convalescence after parturition. The bark of this and of *A. malabarica* D. C., is also used as a vegetable bitter, in forms of dyspepsia.

H. H. Rusby.

AINHUM.—(Synonyms: Ainhun; dactylolysis spontanea; *Absägen* [German]; *Dactiliolisia* [Spanish].) The etymology of the word is usually attributed to Africa, and is derived from a word meaning to "saw off." Matas states that the word ainhum is from the negro patois of Brazil, *ainhoum*, meaning a "fissure."

DEFINITION.—Ainhum is a disease of tropical countries, and is characterized by the gradual painless amputation of one or more joints of one or more toes by a trophic process of mixed atrophy and hypertrophy.

HISTORY.—While the first accurate description of the disease was made by da Silva Lima, of Bahia, Brazil, in 1867, as much earlier as 1860 Dr. Clark called attention to ainhum in the Gold Coast natives. Since 1867, a number of observers have reported upon the disease, notably Dubring and Wile, and Matas in this country. Zambaco Pacha, in the Transactions of the 1897 Lepra Conference in Berlin, writes at length upon the condition in its relation to leprosy.

ETIOLOGY.—The cause of the disease is not known. It has been found in the negro races in the cases reported; it occurs in adults, and is essentially a tropical disease, exotic cases occurring occasionally elsewhere. The parasitic nature of the disease is maintained by some, but it has not been proven. Zambaco Pacha maintains the identity of ainhum and trophic leprosy of the mutilating type.

SYMPTOMS.—Prodromes are absent. There may be some itching, but usually the disease is evidenced by a slightly constricting band, a furrow, at the digito-plantar fold of the fifth toe. At times other toes may be affected. For example, I have seen the great toe involved, at the New Orleans Charity Hospital. The furrow gradually becomes more pronounced, harder in consistency, and more and more constricting, the confined portion of the digit increasing in size so as to lose the shape and form of a toe. There is absence of inflammation and of subjective symptoms, excepting occasional pain. As the constricting band narrows the toe becomes more and more tumefied, until finally only a small pedicle remains. From this the tumor either sloughs off, is torn or knocked off, or is intentionally removed. When ulceration takes place,

FIG. 61.—Annular Scleroderma of the Little Toe Preceding Spontaneous Amputation. (Case of Ainhum; service of Dr. R. Matas, Charity Hospital, New Orleans, La.)

FIG. 62.—Diseased Foot Before Operation. (Case of Dr. C. Peña, Córdova, Republic of Mexico.)

there is a distinct odor, of a nauseous character, resembling that of the neurotic ulcer. The pedicle, or base,

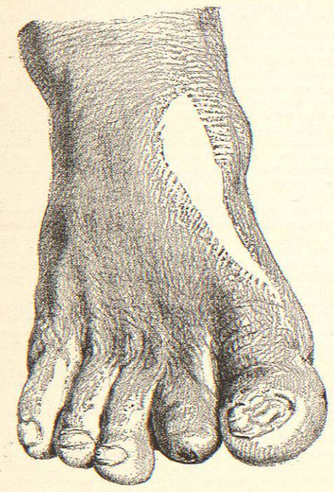

FIG. 63.—The Same After Operation. (Case of Dr. C. Peña.)

heals kindly. The process lasts months—even years in some instances.

PATHOLOGY.—Unna believes the condition to be "a ring-formed scleroderma with callous formation of the epidermis, leading to secondary total stagnating necrosis, resembling artificial snaring of tumors. There is a primary inflammation with marked hypertrophy of the epidermis, the papillæ being narrowed and elongated. In the papillary body there is cellular infiltration; the vessels are dilated. The tumefaction of the toe indicates a stagnation of lymph and fat, which gradually causes degeneration of all of the constituents of the cutis, a rarefaction of the bones, and the disappearance of the phalanges." In this most observers agree, the latest contribution (see Figs. 64, 65, and 66) indicating the above process.

DIFFERENTIAL DIAGNOSIS must be made especially from Raynaud's disease, from paronychia, from the neurotic ulcer, and from leprosy.

Raynaud's disease is nearly always painful, occurs seldom on the lower extremities, is quite common on the upper extremities, and the trophic change is evidenced most often by the occurrence of preliminary lesions, *e.g.*, vesicles or bullæ.

Paronychia is inflammatory throughout and occurs on the ungual phalanx always.

The *neurotic ulcer* begins as a callosity, is circumscribed and deep seated, occurs usually on the plantar surface of

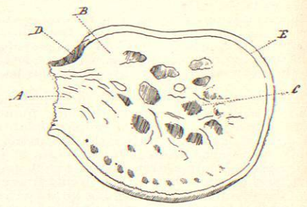

FIG. 64.—Longitudinal Section of the Amputated Toe. *A*, Section of the pedicle; *B*, fibrous fasciculi or bundles; *C*, collections of fatty tissue; *D*, remains of the nail; *E*, epidermis. (Case of Dr. C. Peña.)

the heel or great toe, and is never located just at the digito-plantar fold of the fifth toe. It is characterized almost from the start by the loss of the central tissue and by a persistent slough, exulcerating and discharging freely.

Leprosy of the mutilating type has points of resemblance to ainhum, especially when the latter disease is well

advanced. Leprosy, however, has no preference for the negro, and it is not a tropical disease. The trophic lesions of leprosy are found on any toe or any finger. These are almost invariably associated with other present or past manifestations. The initial evidence of mutilating lep-

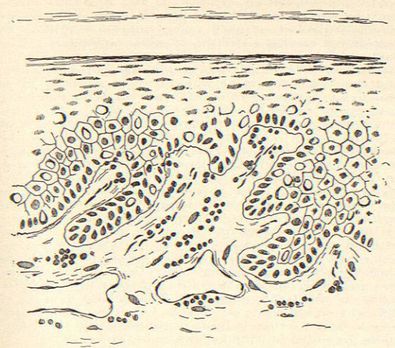

FIG. 65.—Section of the Skin. Moderately enlarged. (Case of Dr. C. Peña.)

rosy is a macule, excoriation, or bulla on the site of the destruction. The initial evidence of ainhum is a callous furrow, without inflammatory redness.

Zambaco Pacha (*loc. cit.*) elaborately argues this point of resemblance, arraying a large number of observers in confirmation of his opinion, but the burden of proof rests with him.

TREATMENT.—All observers agree that perpendicular and free incision of the circular bands may arrest the

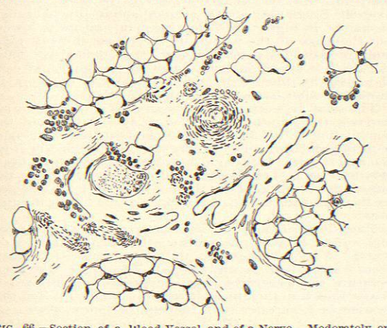

FIG. 66.—Section of a Blood-Vessel and of a Nerve. Moderately enlarged. (Case of Dr. C. Peña.)

process, but that usually the course of spontaneous amputation is completed, unless artificially or surgically produced.

Isadore Dyer.

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AIR.—To appreciate the various sanitary relations of the atmosphere, the subject must be studied from the physical as well as from the chemical standpoint. In considering the physical aspects of air, attention must be given to the subjects of atmospheric pressure, light, heat, humidity, and electrical condition.

The air is an invisible gaseous ocean. In it, as in all gases, there is no cohesion between the molecules. They are apart from one another, and their tendency to spring farther apart and occupy more space is so great that a restraining force is needful to prevent expansion and attenuation. Air at the sea level, the bottom of the aerial ocean, is compressed by the weight of the superincumbent air. This weight expresses the influence of gravity on the air as a whole, or the influence which the earth exerts on the molecules of its atmosphere to keep them from escaping into limitless space or from being whirled away by the centrifugal force of the diurnal rotation. The pressure of the atmosphere at the sea level balances a column of water 34 feet high. It forces water up the cylinder of a pump in proportion as the air pressure within the cylinder is lessened by the working of the piston, but the raising power of the pump is limited by the height mentioned. Similarly at the sea level the atmospheric pressure balances a column of mercury 29.92 inches, or 760 mm., in height (at 45° N. latitude), and as this number of cubic inches of the liquid metal weighs 14.75 pounds, or 1 kgm., to the square centimetre, the air pressure on every measure of surface becomes known. Generally, however, air pressure is expressed in inches of mercury as being more convenient than a statement of the actual weight on a given area. The pressure on a surface of one square foot amounts to nearly a ton. The average man has a surface of about 15 square feet, but the 15 tons of air pressure under which he moves are unfelt because of the fluidity of the atmosphere. The freedom of movement possessed by its molecules transmits their pressure in all directions. Air permeates all porous bodies, and the internal pressure in bodies so permeated counteracts the external pressure. Noticeable effects of air pressure are seen or felt only when there are local disturbances, as when the tissues are pressed by the weight of the atmosphere into the rarefied air of a cupping glass.

The higher we ascend into the atmosphere the less is the pressure, because there is less overlying air to affect us by its weight. Heights are measured by the decreased pressure, and balloonists calculate their distance from the earth by the fall of the mercurial column in their barometers. At the sea level, under a pressure equivalent to that of 29.92 inches of mercury, a cubic foot of air weighs 536 grains. Air is increased in bulk as pressure is diminished. At the height of one mile, the barometric column falls to 24.5 inches, equivalent to a pressure of 12.04 pounds to the square inch. Under this lessened pressure, a cubic foot of sea-level air would expand, other things being equal, to 29.92÷24.5, or 1.22 cubic feet, and one cubic foot of this rarefied air would weigh only 439 grains. The pressure at two miles being equivalent to only 20 inches of mercury, one cubic foot of sea-level air would expand to 29.92÷20, or 1.49 cubic feet, and the weight of a cubic foot of this expanded air would be 360 grains. With increased height there is diminished density, but as the elastic force which separates the molecules becomes lessened by their separation, there may be a certain condition of tenuity in which this force is unable to overcome those which operate in restraint. The depth of the atmospheric