Railway system), to Taylor's Station, 10 miles from Greenville. thence 1 mile to springs.

Chick's Springs are located in a broken, rugged country, about 1,200 feet above the sea level. Paris Mountain, a spur of the Blue Ridge, is only three or four miles distant. The climate of this region is very salubrious and well adapted for pulmonary cases during the winter months. The air is dry, and clear weather with invigorating breezes the rule. The resort has had a wide reputation in the South for many years, but owing to the destruction of the hotel by fire it has not been open to the public until two or three years since, when the present owner built a small hotel and several cottages. A large, new hotel is projected, which, with other improvements, will bring the place up to its old standard of excellence. The springs are two in number, known as the "Iron" and the "Sulphur" Springs, and are about one hundred and fifty feet apart. The following analysis by Dr. Charles U. Shepherd, of Charleston, was sent to us by Mr. Julius C. Smith, of Greenville:

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Calcium sulphate	32.57
Magnesium sulphate	.63
Sodium sulphate	2.37
Sodium silicate	3.69
Potassium silicate	.31
Silica	.50
Iron oxide	.41
Total	40.48

Carbonic acid gas present in appreciable quantities.

These waters have been found of great advantage in cases of atonic dyspepsia accompanied by hepatic congestion. They are also useful auxiliaries in Bright's disease of the kidneys. *James K. Crook.*

CHICORY.—*Cichorium.* The root of *Cichorium Intybus* L. (fam. *Cichoriaceæ*). A perennial, milky-juiced, European herb, with dandelion-like leaves and tall, sparsely branching stems, bearing large, delicate, bright blue flowerheads. It is very abundantly naturalized in this country, along roadsides, and is also extensively cultivated both here and abroad. The root is fleshy and branched, very much like that of dandelion when dry, but rather larger, and deficient in regard to the bright yellow woody ring so distinctly seen in the cross section of dandelion. It is grayish brown externally, whitish within, generally odorless, and but slightly bitter. The cultivated root is larger and darker than the wild. It occurs in commerce mostly cut into halves and quarters of transverse sections, and is heavily wrinkled in drying. The leaves, which are somewhat employed as a salad, are irregularly pinnatified, with a large terminal and small lateral segments. They resemble lettuce in taste, but are more bitter.

The roasted root is very extensively used as an adulterant of, or addition to, or substitute for coffee, and this use is steadily increasing. In some European countries, especially England, it is generally assumed that the customer desires the addition of chicory unless he directs otherwise. To the natural taste, it imparts a bitter and nauseous flavor to the beverage, but this, by custom, becomes tolerable or even agreeable.

Chicory is scarcely entitled to rank as a medicine, although it is laxative and about similar to dandelion in its effects. The root contains *inulin*, like many others in the order, *bitter extractive*, and *sugar*. The flowers contain a peculiar glucoside. *Henry H. Rusby.*

CHIGOE.—SYNONYMS.—Besides the classical terms *Pulex penetrans*, *Dermatophilus*, *Rhynchoprion penetrans*, and *Sarcopsylla penetrans*, this troublesome tropical parasite is known by the following names: aagrini, atten, bicho, bichos dos pes, chego, chegoe, chegre, chica, chico, chicque, chigga, chigger, chiggre, chigo, chigoe, chigua, chique, ckicke, earth-flea, jatecuba, jigger, migor, nigua, pico, picque, pigne, pigue, pique, punque, sand-flea, sandfloh, seccec, sico, sike, sikka, siko, tchike, tom, ton, tschicke, tschik, tschike, tû, tunga, tungay, xique.

ETYMOLOGY.—*Chigoe* is supposed to be derived from the Spanish *chiquito*, small.

For natural history, classification, anatomy, etc., see article *Insects*.

GEOGRAPHICAL DISTRIBUTION.—The chigoe is confined exclusively to the tropics, and is probably indigenous to South America. It is most prevalent in the West Indies, and Central and tropical America, its bounds being about 30° of latitude North and South. Within these limits it is certainly very common indeed, and for its size is the most troublesome of all the tropical pests. Till about twenty-five years ago it had never been known out of the Western hemisphere, save for a stray case imported into Europe from South America or the West Indies (one such case is elaborately reported by Laboulbène); but in 1872 or 1873 it was found in tropical Africa, and within the last decade it is said to have reached South China.

Probably it will be found all over the tropics. It is most abundant in the dry sandy soil, and in the parts near the sea; also in pens, stables, and in the dust, ashes, etc., of neglected, unswept houses. Negroes are chiefly affected, and those who work or go about with bare feet, and are not accustomed to hygienic surroundings and conditions. Europeans and newcomers suffer the most, but probably because the older residents know what trouble these little pests can give, and have learnt from experience to appreciate the first signs of the presence of the parasite. Women and children with their thinner and more delicate skin suffer very much. Soldiers have been attacked by these tiny parasites and have been discomfited if not routed by them. "It is stated that as early as 1538 a division of Spanish troops was disabled from marching by swarms of the parasite settling in their feet. In recent times the French troops under Bazaine, in the Mexican expedition, had the same unfortunate experience" (Hirsch).

Short Description.—The chigoe is a parasite of the "flea" tribe; it is smaller than the flea, but has a larger head. It attacks birds, warm-blooded animals both wild and domestic, as well as the human subject. The male and immature female are both free parasites, obtaining their board and lodging wherever they can, but on impregnation the female seeks a host. It is the impregnated female that causes all the trouble, and it is to her alone that we refer in the present article. With its head the chigoe bores into the skin, going obliquely through the epidermis; it then enters between the epidermis and dermis, and burrows down into the latter, but probably never goes deeper; from the capillaries of this region it obtains its food supply.

Parts Affected.—All portions of the body are liable to attack, but the chigoe exhibits a decided preference for the feet. These are nearly always involved, especially under and around the nails, and in the digito-plantar fold. The insertion of the tendo Achillis is another favorite place. The dorsum of the foot is very seldom involved. Next to the feet, the scrotum, prepuce, corona glandis, axilla, arm, forearm, palm of hand, lower eyelid, cheek, neck, elbow, and knee are places of predilection; and as the feet and genitals are oftenest attacked, the question has been raised as to how far the chigoe is attracted by the odor of those parts, especially in the uncleanly. As a rule only one or a few chigoes are found, but Bonnett reports a case in which he found no fewer than three hundred in one person. It has also been stated that the chigoe likes to effect an entrance either near to another chigoe, or into the very spot which another chigoe has previously occupied; the neighborhood of an ulcer produced by her comrades is also attractive to the chigoe.

CLINICAL COURSE AND SYMPTOMS.—Three stages have been described, but ordinarily only the first two are observed; and if proper care be bestowed the trouble is limited to the first stage.

1. *Period of Invasion.*—This lasts for from twenty-four to thirty-six hours, and is marked by itching and tick-

ling, due to the perforation of the skin. The sensation, which at first is not very definitely localized and sometimes is a little way from the actual seat of the trouble, is rather pleasant than otherwise; and many people have been known to keep the insect for a day or two before extracting it. The pain or discomfort is intermittent; but as the sac with the eggs increases in size it presses on the neighboring tissues and gives rise to a slight pain, which later becomes dull and throbbing and increases in intensity. At first there is nothing to be seen, but as the sac grows there can be observed a small spot, black or dark blue in color, and somewhat deeply set in the skin which at this stage is hardly raised. If the trouble be near a nail (as it is very apt to be) inflammation will soon follow unless the sac be carefully extracted. In delicate people even one chigoe will cause lameness and hinder walking.

2. *Period of Inflammation.*—If the insect be allowed to remain in the tissues, or the sac be ruptured and some of the eggs remain, inflammation ensues, the intensity of which depends on the thickness of the skin and the richness of its vascular and nerve supply. If the skin is thick, there are pain, very little heat or redness, and little or no swelling; in other cases there are considerable pain, heat, and redness, and a serous fluid is present. If there are several parasites with well-developed sacs, the degree of inflammation is very great, and there is the possibility of further trouble. This second stage lasts for four or five days, sometimes longer; the inflammation only ceasing on the extraction of the chigoe.

3. *Period of Ulceration.*—If the part be still neglected and the inflammation remain unchecked, a large ulceration occurs; the vessels may become obliterated, and gangrene is a possible result. Ulceration is very common when several chigoes are present in close proximity: and the union of several small ulcers gives a very ugly sore. The ulcer is characterized by red, scalloped edges, grayish base, and thin fetid pus which may separate the epidermis from the dermis. These ulcers are apt to spread along the surface, and in very severe cases the skin is destroyed, subjacent structures are denuded, tendons laid bare, phalanges may be necrosed, and toes drop off. This is exceedingly rare, and we believe that the severe symptoms attributed to this stage have been exaggerated.

PROPHYLAXIS consists in personal cleanliness, particularly in constant bathing of the feet. Avoid sleeping on the ground, and do not go barefooted. Keep socks and bedroom slippers off the floor when not in use. See that rooms are swept and floors sprinkled. Some people use a pungent essential oil to keep away the insect, the natives employing an infusion of tobacco leaves for this purpose.

TREATMENT.—There is but one method that can be recommended, and that is careful extraction of the sac at the earliest possible moment. On the first itching sensation a search should be instituted for the insect, which when found should be at once dislodged. This is best accomplished with a sharp needle, which should be sterilized by passing through a flame, and then carefully inserted in the opening made by the chigoe, and passed round the sac, separating it from the tissues, and when thus loosened it can be extruded. Great care must be taken to avoid breaking the sac and scattering the eggs. If unfortunately this should occur, wash out the débris with water (sterile if possible) or a mild solution of bichloride of mercury. If the skin is very thick an incision may be necessary. The negresses are skilful in "echiquage" (as extraction of a chigoe is termed), but it is very necessary to see that they employ a surgically clean needle. If a dressing is considered necessary, a three or four per cent. solution of carbolic is as good as any. If the wound is large and intractable to ordinary treatment, you may have to curette and treat as any other fresh wound. Care must be taken to prevent the entrance of any pathogenic bacteria. Inflammation is treated in the usual way. If ulceration has occurred, chloroform liniment or mercurial ointment can be employed; and in the very worst cases, and those badly neglected, amputation may be necessary. *R. J. E. Scott.*

REFERENCES.

Bonnet: Arch. de méd. nav., 1867.
Brassac: Arch. de méd. nav., 1865.
Hirsch: Handbook of Geog. and Hist. Path. New Syd. Soc., vol. ii., 1885.
Laboulbène: Dict. Encyclop. des Sciences Médicales. Paris, 1875, tom. xvi.
In the last two of these there is a very complete bibliography.

CHILBLAIN. See *Dermatitis calorica.*

CHILDHOOD.—In the arbitrary division of life employed for purposes of description or discussion, childhood includes the period from the end of the second year to puberty. The material for our consideration, therefore, includes all the phenomena that belong to the human organism in its progress from the conditions prevailing at the end of the second year of life to those of maturity.

Naturally at the outset of this period the organism, both in conformation and in function, corresponds closely to the infantile type, yet it has progressed sufficiently far to exhibit in some degree nearly all the powers that belong to the fully developed organism. No essentially new powers are developed until the concluding years of the period introduce the changes incident to puberty.

At the end of the second year the body still maintains many of the infantile characteristics. The head is large in proportion to the size of the body, its circumference being about nineteen inches; the trunk is large in proportion to the extremities, the general outlines are full and round. The child at this age, however, has attained such a degree of muscular co-ordination that he is able to stand, walk, or run, and to use the hands freely. The special senses are all awakened to a degree, and he has acquired a certain small store of experience, is constantly adding to that store, and in a feeble way reasoning upon the results of it. The same development from the condition at birth, which is so especially notable in the case of the brain and nervous system, is also to be observed in the other organs of the body. The lachrymal glands are very active, the mouth has filled with teeth, the salivary glands have assumed their functions, the stomach and intestines are possessed of increased digestive power, and the eliminative functions of the kidneys are more in evidence. A more detailed consideration of some of the anatomical and physiological peculiarities of childhood will be in order.

The Skin.—The superficial area of the body in childhood relatively to the size and weight of the body is much greater than in adult life. Changes in the condition of the skin have, therefore, a relatively greater influence in the earlier years. Children react to cold or hot applications to the surface of the body very quickly and markedly. Hydropathic treatment must therefore be carried out very carefully, and the length of exposure to either heat or cold regulated by the effect upon the general condition. Under proper regulation we can expect more marked and lasting effects from such measures in children in an inverse relation to their age. Thus simple sponging of the surface of the body with cold water or the application of a cold pack may be quite sufficient in a child to produce an effect which in an adult would require a prolonged cold bath.

The sensitiveness of the child to sudden changes of the temperature of the body should not be lost sight of in considering the questions of hygiene. The surface of the body should, as a rule, be protected, even in summer. The exposure of the neck and chest, arms and legs of a delicate child—often resorted to by mothers in the belief that it will "harden" the child—is much more likely to result in weakening it or even producing definite and severe illness.

Except in the hottest part of summer flannel or wool should be worn next the skin, and whenever it is dispensed with, particular care should be exercised to prevent sudden chilling of the surface of the body. Proper

care of the surface of the body will protect a child from many of the attacks of inflammation of the respiratory or alimentary tract to which childhood is so susceptible.

On the other hand, daily bathing should be as systematically carried out in childhood as in infant or adult life. No specific rule can be given for the temperature or duration of the daily bath. These must be regulated according to age and constitutional vigor. A bath that leaves a child blue, cold, and shivering for some time after it must be harmful, but such results are unnecessary. Either by lessening the duration of the bath or by raising the temperature of the water, they may not only be avoided, but in their stead we can secure a healthy reaction which will leave the skin warm and glowing and the child stimulated and strengthened. No other one measure is so potent in increasing the vitality of weakly children and enabling them to avoid the constant recurrence of colds as systematic bathing with water at the lowest temperature compatible with a proper reaction. As a rule, the gradual reduction of the temperature of the bath is not only feasible, but advisable. The rate of reduction must be regulated by the effects produced.

Not only is the skin area relatively greater in childhood, but the skin itself is more delicate and more readily affected by any application. The use of external remedies, either in the form of lotions, ointments, dressings, or local applications, must be carefully watched and limited to small areas. Local irritants or caustics are to be employed with care. Blisters, burns, and severe ulcerations are readily produced by incautious applications to the skin; even grave constitutional effects may be produced by the external use of such readily absorbable substances as carbolic acid and its allies.

The skin in childhood readily reflects disturbances of other parts of the body, especially the gastro-intestinal tract. Eruptions dependent upon disturbances of the stomach or bowels are frequently seen, and the dietetic treatment of skin diseases is seemingly much more potent in childhood than in adult years.

The Bones.—At the beginning of childhood the bones are still very cartilaginous and soft. Ossification progresses very slowly till puberty is reached. The fontanels are closed, but the bones of the skull are still relatively thin and soft, and the sutures remain open for many years. The spine of a child is remarkably soft and flexible, because of the limited ossification of the vertebræ. At the end of the second year it still presents the nearly perpendicular column characteristic of infancy. During childhood the S-like antero-posterior curvature characteristic of adult life is developed. Owing to the softness of the vertebræ and the laxity of the ligaments, the conformation of the spine during childhood is readily influenced by the attitudes of the body, and much more attention than is usually given should be paid to the postures and carriage of the child.

The thorax of the child gradually changes its form from the change in the curvature of the spine and attendant changes in the direction of the ribs. The ribs, as age increases, are directed more obliquely downward. The thorax becomes relatively broader above than below, a reversal of the conditions found in infancy.

The pelvis in childhood gradually enlarges so as to be more capacious, and receives more of the abdominal viscera, thus diminishing the prominence of the abdomen so notable in early life. There is practically no difference in the pelves of the two sexes until the changes of puberty introduce the special characters of the sexes.

The bones of the extremities in childhood show the division into diaphyses and epiphyses. There is active growth at the junction of the shaft and epiphysis; the bones are still soft and easily affected by pressure. In consequence of these conditions deformities are easily produced, and are also, as a rule, readily amenable to proper mechanical treatment.

The Teeth.—At the close of the second year, or within the following sixth months, the eruption of temporary teeth, twenty in number, is completed. At this time the child has not only the temporary teeth, but also the calcified crowns of all the permanent teeth except the second and third molars. The crowns of the second molars begin to be calcified during the fourth or the fifth year, but the third molars, or wisdom teeth, are not calcified till puberty. At the end of the fifth, or the beginning of the sixth year, therefore, the jaws contain not only the temporary teeth, but all the permanent excepting the wisdom teeth. At this period there occurs a marked development of the jaws in the horizontal plane, in order to accommodate the permanent molars, which make their appearance posteriorly to the temporary molars. The permanent teeth are cut in the following order:

	Year.
Molar, first	Sixth.
Incisor, central	Seventh.
Incisor, lateral	Eighth.
Bicuspid, anterior	Ninth.
Bicuspid, posterior	Tenth.
Canines	Eleventh to twelfth.
Molars, second	Twelfth to thirteenth.
Molars, third	Seventeenth to twenty-fifth.

Owing to this eruption of the permanent teeth, the care of the teeth in childhood is of especial importance. Undoubtedly much of the common early decay of the permanent teeth is to be attributed to lack of care of the mouth during the critical period of their eruption. Usually as soon as the proper care is given, the decay ceases, and the condition of the teeth remains good for many years. Good teeth are so necessary to the preparation of food for digestion that every effort made for their preservation is a step toward improved digestion and assimilation.

The Alimentary Tract.—Anatomically the child possesses practically the digestive apparatus of an adult. That is, he has teeth, salivary glands, œsophagus, stomach, small intestine (relatively longer than in an adult), large intestine, rectum, liver, gall bladder, and pancreas. There are certain slight anatomical differences from the adult type. The stomach occupies still a somewhat more vertical position, and the cardiac sphincter is poorly developed. The liver is relatively large. The small intestine is relatively long. Little of the intestines is found in the pelvis owing to its small size. The sigmoid flexure is remarkably long and may be found in almost any part of the abdomen. These differences, however, are not sufficient to account for any marked difference in the digestion of this period from that of adult life. Functionally also the several parts of the digestive apparatus are active. Still there is a notable deficiency in the digestive powers in the earlier years of childhood. The several digestive fluids have not the power that they acquire in later life, and undoubtedly much harm is done children by allowing them from their earliest years the general diet of their parents. The transition from the milk diet of the first two years to a general diet should be slowly and cautiously made.

The rapidity of bodily growth and the unceasing activity of children render the metabolism of the organism much more rapid than in adult life. A child therefore requires an amount of food greatly out of proportion to its size and weight. According to the estimates, partly based on experiment, partly arbitrarily assumed, of Atwater and Bryant,[1] a child from 3 to 5 years old requires 0.4 the food of a man; a child from 6 to 9 years old requires 0.5 the food of a man, and a child from 10 to 13 years old, 0.6 the food of a man.

According to Edward Smith, the growing child, in proportion to its weight, requires about three times as much carbonaceous food as the adult and six times as much animal food. Evidently if these demands are to be met, care will be required in both the selection and the preparation of the food during this period of life. In the absence of such care disorders of stomach and intestines naturally result. Probably the great majority of children, especially those of school age, suffer in greater or less degree from indigestion and constipation, or diarrhœa. In the earlier years the parents require instruction as to the proper care of their children's diet; later the

children themselves require instruction and training in these fundamental matters of health. It is impossible in this article to go minutely into the diet of children of various ages. Thompson's "Practical Dietetics" contains a store of information on the subject.

The Kidneys.—In keeping with the generally more active metabolism of the child, it is commonly agreed that children void relatively more urine than adults and that the proportion of urea is higher. The most extensive observations the writer has been able to find are those of F. S. Churchill,[2] made upon the children of the Half-Orphan Asylum of Chicago. These observations are so complete as to make them especially valuable, and they are therefore reproduced in full:

URINE IN CHILDHOOD—F. S. CHURCHILL.

Age.	Weight in kilogram.	Sex.	Total specimens.	Amount in cubic centimetres.	Specific gravity.	Urea, per cent.	Total urea, grams.	Chlorides, grams.	Phosphates, grams.	Sulphates.	Amount of urine to 1 kgm. body weight.	Urea to 1 kgm. body weight.
3 years	16.8	2 males.	5	358	1024.0	2.2	7.87	12.50	12.00	1.08	21.3	0.468
4 "	16.9	7 males. 4 females.	31	299	1027.1	2.9	8.67	11.17	9.22	1.41	17.6	.513
5 "	16.8	1 male. 7 females.	17	392	1024.5	2.6	10.19	10.37	8.89	1.13	23.3	.606
6 "	16.7	2 females.	2	405	1023	2.7	10.94	11.00	6.50	1.13	24.2	.655
7 "	20.9	1 male. 3 females.	4	564	1018	1.1	6.20	7.00	5.63	.85	26.9	.296
8 "	22.6	2 males. 7 females.	20	628	1021.1	2.2	13.82	9.16	7.32	1.11	27.8	.611
9 "	26.2	1 male. 9 females.	25	731	1020.7	2.3	16.81	8.46	7.61	1.10	27.9	.641
10 "	27.5	2 males. 6 females.	15	768	1023.5	2.1	11.28	9.29	6.85	1.10	21.9	.592
11 "	27.2	1 male. 3 females.	7	716	1018.8	2.3	16.83	10.03	7.50	.92	26.3	.618
12 "	36.4	2 males. 3 females.	8	829	1021.5	2.8	23.21	9.27	6.77	1.00	22.7	.637

The quantities given in this table, although their accuracy is emphasized by the observer, are notably below those reported by others. Holt's[3] table, compiled by combining the results of eight observers, gives the average quantity at the ages of 2 to 5 years as 500 to 800 c.c.; at 5 to 8 years as 600 to 1,200 c.c.; at 8 to 14 years as 1,000 to 1,500 c.c. The amounts are also below those given by Vierordt in Gerhardt's "Handbook."

The specific gravity noted by Churchill is, as would be expected with the smaller quantity, notably higher than that given by other observers. The percentage of urea is also notably high and remarkably constant. The ratio of urea to 1 kgm. of body weight, while lower than that given by other observers, is still higher than that obtained in adult life.

The elimination of chlorides is not remarkable. The phosphates are lower than in adult life, the deficiency being explained on the ground that they are retained in the system to facilitate the development of bone which belongs to the period of childhood.

Carrière and Marfet thus sum up the results of their observations upon the urine in childhood:

1. The child voids relatively more urine than the adult.
2. The specific gravity is higher.
3. The acidity is greater.
4. The nitrogenous metabolism is more active than in the adult, that is, 1 kgm. of a child uses up a weight of nitrogen more completely, the adult percentage of utilized nitrogen being eighty-five, while in a child it is ninety.
5. The mineral nutrition shows marked differences, the younger organism being more highly mineralized.
6. All the phenomena of nutrition are much more active in the child than in the adult, the maximum being from the fifth to the tenth year.
7. The standard figures of the composition of normal urine for the adult are not applicable to children.

The process of urination in early childhood is marked by frequency and lack of control. In the third year the urine may be retained during sleep for eight or nine hours, during the day for two or three hours. Any unfavorable disturbance of the general health or impairment of nervous tone is marked in early childhood by loss of this control of the bladder. Incontinence of urine is a very common complaint at this period of life and is usually accompanied by a marked increase in the frequency of micturition, a child of three to five years often urinating every hour or even more frequently. In health the ability to control the bladder should at this period of life increase steadily with increasing years.

The Lymphatic System.—The lymphatics and lymph nodes in children are relatively large and much more active than in the adult. Absorption from the surface, either of skin or mucous membranes, occurs with marked rapidity. As a consequence the lymph nodes are found enlarged with unusual frequency. Indeed, enlargement of the lymph nodes, to such a degree as to render them palpable, is so common in children whose nutrition is under par or whose general care of the body is poor, that it assumes much less importance as a symptom of disease than we attach to it in later life. The lymph nodes are especially affected in tuberculosis and in all acute inflammatory processes, especially those of the throat.

The Nervous System.—In the comparison of a child with an adult the greatest disparity is found in the relation of brain weight to body weight. Thus at birth the brain weighs one-sixth the weight of the body, in the third year it is one-eighteenth, in adult life one-forty-third. The cord is also relatively large, although not to the degree noted with reference to the brain. Side by side with this large size of the nervous system we must note its unusual activity and sensitiveness during the early years of life. The normal healthy child during its waking hours is never still. Ceaseless action is an actual requirement behind which must lie a ceaseless activity of the brain and cord. Every sense is constantly on the alert for the new impressions that are pouring in upon the awakening mind, every muscle is in almost constant action in carrying out the impulses that result from these stimuli. Rapid development in the functions of the brain and nervous system marks the years of childhood. Recent investigations have shown that this mental development is accompanied by definite changes in the individual cells of the spinal cord and brain. The immature cells of the cortex or of the cord show steadily progressive changes in the development of new, more numerous, and more intricate communication with one another. Hand-in-hand with these rapid changes, both in functions and in physical structure, there goes a remarkable sensitiveness of the nervous system of the child. Children are, therefore, peculiarly subject to functional nervous disorders. Much of the irritability and peevishness of childhood is simply the expression of abnormal conditions of the nervous system.

In acute diseases of all kinds the nervous symptoms in childhood are likely to be very marked. The onset of

the acute infectious diseases with convulsions is well known, likewise convulsions resulting from an overburdened stomach or from the decomposition of food in the bowels. It is less generally known that, especially in pneumonia, children may present many of the symptoms of meningitis, profound stupor, or coma, strabismus, rigidity of the neck, etc., without any involvement of the meninges, the severe nervous symptoms arising from the toxæmia of the pneumonia. Examples might be multiplied to show how sensitive the nervous system of the child is and how profoundly it may be affected by the condition of organs or parts apparently remotely connected with it. Perfect health of the whole body is essential to the equilibrium of the nervous system, and if we desire the best results in the development of intellect we must attend to the health of each and every part of the body.

Development of the Body.—It is evidently impossible to follow the development of the various organs and parts of the body in detail. Within recent years a vast amount of work has been done in measuring the height and weight of school-children of various ages and calculating the averages of large numbers. The accompanying table gives the results obtained by combining a large number of such tables. Naturally the larger the number of cases comprised in a table, the nearer the results approximate a true average. In comparing any two of the tables embraced in this computation, remarkable differences are at times notable; at other times the agreement between measurements of children in widely separated communities and under different social conditions is equally remarkable. The figures herewith given may be considered to represent a safe average for the field covered. In later observations along this line, notably those of Dr. W. T. Porter on the school-children of St. Louis, the girth of the chest is calculated for each year, also the probable deviation in any one of three factors—height, weight, and chest circumference. By comparison with such standards we may calculate how closely a child in its physical development corresponds to the average, and regulate its life accordingly.

AVERAGE HEIGHT IN CENTIMETRES AND WEIGHT IN KILOGRAMS OF CHILDREN. COMPILED FROM TABLES OF QUETELET, BRUSSELS; BOWDITCH, BOSTON; KOTELMAN, HAMBURG; PAGLIANI, TURIN, AND THE SWEDISH AND DANISH COMMISSIONS.

Age.	Height.	Weight.	Age.	Height.	Weight.
2–3 years.....	79.1	11	9–10 years.....	126.1	25.6
3–4 "	86.2	12.5	10–11 "	129.8	27.6
4–5 "	92.4	13.8	11–12 "	133.9	29.6
5–6 "	102.8	16.9	12–13 "	138.2	32.1
6–7 "	109.4	19.3	13–14 "	142.8	35.2
7–8 "	115	21.4	14–15 "	148.5	39.3
8–9 "	120.4	23.4	15–16 "	154.6	45.4

In studying boys and girls separately certain differences are notable. Up to the eleventh or twelfth year boys are somewhat taller and heavier than girls of the same age. At the twelfth year the girls begin to grow rapidly, and from that time till the fourteenth or fifteenth year, the measurements of the girls are the larger. Then from fourteen to sixteen years the boys begin to grow rapidly, regain the lead and continue to hold it. This rapid growth, in girls from the twelfth to the fourteenth year, in boys from the fourteenth to the sixteenth, is spoken of as the prepubertal increase, as it is, of course, associated with the well-known earlier maturity of the female organism. Investigation has also shown that the growth, either in height or weight, is not continuous throughout the year. Spring and early summer are the time of most rapid increase in height, and in the course of a few months at this time most of the annual increase in height is accomplished. In a similar way most of the gain in weight is made in the latter part of summer and the fall. The winter, therefore, is a period of no gain; there may even be a loss of weight.

It is inadvisable in this place to attempt to discuss the physical and mental changes which belong to the transition from childhood to puberty. It may, however, be urged that the child's welfare, both of body and mind, demands such preparation for the changes that belong to this period, such education that the knowledge that must come shall come clean and undefiled. Parents and teachers have been too long negligent of these matters. They should be roused to their duties. The evil consequences of the policy of "*laissez faire*" are matters of common knowledge. It should no longer be permitted that any child should pass through one of the crises of life without a word of instruction or admonition as to the meaning of the changes that he or she must experience.

Mental Development.—To fully describe the mental development of childhood would require a complete psychology. What mainly interests us here is the initial stages. Bain[5] has given a simple account of these, and from him the following exposition is taken: In describing the mental status and progress of children, "there are," he says, "a few set phrases that are regularly brought into service. The child, it is said, has a great love of activity, a desire to be occupied somehow; dislikes continuous application or attention to any one thing; is joyous, mirthsome, fond of fun and frolic; delights in the exercise of the senses, and sensation generally; is curious and inquisitive even to destructiveness; is strongly given to imitation; is remarkably credulous; is imaginative and fond of dramatizing; is sociable and sympathetic. On the more exclusively intellectual side the child is prone to observation and averse to abstraction; strong in memory and weak in judgment."

He then proceeds to recast these observations in formal psychological terms under the several classes of activities, senses, emotions, and intellectual powers.

Activity is spontaneous and abundant, but fluctuating, uncertain, and indirect, being the outpouring and overflow of natural energy. Among the first efforts at education is the attempt to give it useful directions, but the readiest way is not to force it, but to take it at the moment when it is fallen on a good course.

The Senses.—These being fresh, and everything being new, sensation as such is delightful and coveted; hence the employment of the senses and the fruition of the effects are intense in infancy. But at first the emotional side preponderates, and the intellectual side, which is nourished by nice distinctions, does not attain an early development. The emotional force partly paves the way for, but partly obstructs, the intellectual.

The emotions, strictly so called, are distinguished from the sense enjoyments. These are mainly the strong social feelings, love and affection; the strong anti-social feelings, anger, egotism, domination, together with the workings of fear. All are powerful from the dawn of life; education, while connecting them with special objects, may do something to intensify or enfeeble their total force.

The Intellect.—The fundamental tendencies or functions—discrimination, discovery of agreements, retentiveness or memory, are at work from the first; but the active emotional development keeps them all down at the outset, although doing something that will provide materials that will be used in a future day. The operation of intellect is requisite to such complex growths as curiosity, imagination, dramatization, imitation, and fancy. The higher workings of intellect become necessary even to the observation of facts in any form that deserves the name.

Turning to the question of progress in mental development, Bain shows that the first start in knowledge is made through spontaneous and overflowing activity and in the interest of the impressions upon the senses; all which in the pristine freshness afford an abounding enjoyment. He then goes on to show how the child's field of knowledge is enlarged by attention to things or impressions which, not directly pleasurable in themselves, gain attention by association with the pleasurable. Thus the child is gradually led up to the acquisition of the indifferent, that is, knowledge devoid of the element of pleasure. However far along this path the child may be

led by mingling the indifferent with the pleasurable, the time comes when nothing short of the wish or will of a superior will keep the child to the acquisition of such knowledge. Fixed or concentrated attention to what is devoid of pleasure is unnatural and only to be secured by means of education.

It is evident from the foregoing that the early mental life of a child is made up of accumulating sensations or sense impressions. Most of these are very simple and crude. Only gradually does a child learn to observe closely or accurately. Still more slowly does he learn to associate his impressions one with the other, to compare them or to reach general propositions. According to one authority, it is years before the child learns to distinguish between the subjective and the objective. The power of abstract reasoning is developed, as a rule, only as the child nears maturity.

Study of the mental development of a child attains its all-important practical application in the arrangement of studies in the course of education.

Development of motor power and control should not be lost sight of in considering the growth of the mind. Gradually the child attains more and more control over the movements of the eyes, the imperfect speech of early years gives place to clear and distinct enunciation, the hands and feet are used with constantly increasing skill and accuracy, and finally, the movements of the several parts of the body may be co-ordinated in actions of extreme delicacy and complexity. Increasing strength should also naturally be developed in the years of childhood.

School Life.—All but the earliest years of childhood are now regularly occupied in attendance upon schools. The conditions of school life must, therefore, have most important influences upon the welfare of the child. It is coming to be recognized that however important education may be, it need not and must not be sought at the expense of the child's health. As Spencer[6] says: "People are beginning to see that the first requisite to success in life is to be a good animal." Care is being taken that schoolrooms are so constructed as to give proper light, heat, and ventilation, that the seats should no longer be so made as to directly contribute to deformities of the body, that the children are so seated as to avoid unfavorable straining of the eyes, that in every possible way the appointments of the schools shall contribute to health and not to disease. The tendencies of the times are plain, but there are unhappily many places where they are little felt.

In the larger cities daily inspection of the school-children by competent physicians has been instituted in the effort to prevent the spread of contagious diseases, of which the schools have been notorious hotbeds. In New York City many of the schools are thrown open as places of recreation for the pupils during the summer months.

Health of mind is no less to be sought than health of body. Recent years have brought great changes in the methods of school instruction, especially in the earlier years. The names of Pestolozzi and Froebel are constantly heard as the ideal teachers of the young, and the popular opinion is that their leading should be followed. As a matter of fact it is the spirit rather than the method of these men that still lives. The efforts made to follow their methods have resulted, as Oppenheim[7] very clearly shows, in much that is not only valueless but even harmful, yet on the whole the present education of the young is on a vastly higher and better level than ever before. Not a little of the change has been due to the teachings of such men as Spencer and Bain that the best method of education is that which observes the natural unfolding of the child's mind; that in the arrangement of studies or in the introduction or pursuit of any subject we should follow or consult the natural leadings of the mind of the child and not attempt to force it according to our preconceived ideas. Education is recognized as a process to be wrought out from within, and not to be put upon the child from without.

Moreover, much attention is now being given to the study of the immediate effects of confinement in school, hours of study, etc., upon the nervous system of the child, as these are shown by various nerve reactions. Nearly all such investigations go to show that our school sessions are altogether too long, that the periods of application to individual subjects are likewise too long, that there is not sufficient variety in the tasks assigned, and that the periods of relaxation are far too infrequent.

Pauli,[9] discussing this subject, advises one school session a day with limitation of the period of study of any one subject to three-quarters of an hour, with an interval of rest before the next study period.

A much-needed reform in these several directions may be looked for, but it is not probable that we shall ever be able to reach the ideal position, pictured by zealous advocates of reform, where the pursuit and acquirement of knowledge shall be an uninterrupted pleasure. Nay, were this hope realized, we would only have succeeded in destroying one of the most essential features in either physical or mental training, the ability to face and accomplish unpleasant or difficult tasks. That such things must be met in mature life is undoubted; that we should be trained to meet them seems, therefore, to be unquestionable. Theories of education should not lead us to ignore the teachings of common experience.

Disease in Childhood.—Partly by reason of susceptibility, partly from the conditions of life, childhood is preeminently the period of the acute infectious diseases, especially measles, scarlet fever, diphtheria, and whooping-cough. Greater attention to prophylaxis, especially the isolation of the sick and the disinfection of the infected room or apartment, is slowly but steadily lessening the ravages of these diseases. In the case of diphtheria the discovery of the specific micro-organism, resulting in earlier diagnosis and the early use of antitoxin, has produced a most remarkable reduction of the mortality, and to a larger extent robbed the disease of its terror. The other members of this group have thus far refused to yield the secret of their power, the pathogenic micro-organisms remain unknown, and progress waits on their discovery.

Affections of the respiratory system are not so common in childhood as in infancy, but still constitute a large part of the sick lists, and are responsible for many deaths. Bronchitis and broncho-pneumonia are the most common. Empyema is much less frequent, but not so rare as generally supposed. The latter is rarely primary; in the great majority of cases it follows a pneumonia, especially the complicating pneumonias of the acute infectious diseases. Tuberculosis limited to the lungs is rare in the early years of childhood; it becomes relatively more common later on, especially after the seventh year.

Disorders of the alimentary tract are very common in childhood, but are much less severe than in infancy. They are in great part acute inflammations produced by improper food and, as a rule, are readily amenable to treatment. As already stated, indigestion, constipation, and chronic diarrhœas from improper feeding are very frequent.

As a class, children are very susceptible to tuberculosis, which manifests itself in many forms. In the earlier years the common form is a general miliary tuberculosis. The terminal stage of such a general process is very frequently a tuberculous meningitis. The meningitis may occur independently of involvement of other organs, but rarely so. Recently in studying the reports of a large orthopædic dispensary and hospital the writer found that of all the deaths reported in cases of hip-joint or knee disease (nearly all of which are tuberculous), twenty-five per cent. were due to meningitis. Children with tuberculous disease of the bones (especially the spine and larger joints) constitute the major part of the clientèle of orthopædic institutions.

Tuberculous enlargements of the lymph nodes are very common in childhood.

Intestinal tuberculosis is common in children suffering

from tuberculous processes in the lungs; as a primary affection it is very rare. The main avenue of infection in children is the respiratory tract. In the tables of Northrup and the writer,[8] out of two hundred autopsies on cases of tuberculosis in children, in three only were the intestines the port of entry, the remainder being all cases of primary infection of the bronchial lymph nodes. Therefore, while recognizing the possibility of intestinal infection from tuberculous milk or meat and taking every precaution to prevent entrance by that route, we shall not check the ravages of tuberculosis among children till we have solved the problem of preventing infection through the air they breathe.

Mortality.—The mortality of the early years of childhood (*i.e.*, from the second to the fifth year) is still high, but not at all comparable to that of infancy. Thus in round numbers the death records of New York City for 1899 in a population somewhat over 3,500,000 show 20,000 deaths in the first two years of life, 4,000 in the succeeding three years. In three years we have but one-fifth the number of deaths credited to the first two years of life. The contrast is even more remarkable with the later years of childhood. After the fifth year the number of deaths is calculated only for periods of five years each.

In 1899 in New York City there were but 1,815 deaths in children from five to ten years of age, while of those from ten to fifteen years but 788 died. As there is no means of calculating the numbers of children living of these several ages, we cannot calculate the ratio of deaths to the number of living. It is evident, however, from the data obtainable that the period from the tenth to the fifteenth year shows the lowest death rate of any equal period of life. Coincident with the fall in the mortality lists after the second year, there is a change in the causes of death. In infancy diarrhœal diseases are the great cause of death, while the acute infectious diseases take the first rank in childhood. Of these it is generally agreed that diphtheria and scarlet fever are the most malignant. Measles is not generally regarded as a dangerous disease, but in the same year, 1899, in New York City, there were 533 deaths from scarlet fever and 587 from measles. Upon the basis of cases of these diseases reported during the year, 7,387 for scarlet fever and 12,530 for measles, the death rate for scarlet fever is about 7.2 per cent., for measles, 4.6 per cent., yet the total loss to the community from measles is greater than that from scarlet fever. Doubtless the lack of appreciation of the malignity of measles is due to the fact that its ravages are greatest in hospitals or asylums, while in private families the disease is usually of a milder type; there is no such difference in the action of scarlet fever. Inasmuch as the deaths from diseases are not tabulated according to the ages of the victims, we have been obliged to assume that the total figures as given for all ages would have the same relations as those of childhood alone; considering the known predilection of these diseases for the years of childhood, this is probably true.

Next to the acute infectious diseases, the worst enemies of childhood are pneumonia and tuberculosis. There is nothing peculiar in the relation of pneumonia to childhood; it is the scourge of all ages. Tuberculosis in the early years, in a fatal form, is generally, as previously noted, either a diffuse process, affecting many parts, or tuberculous meningitis. As age increases a change is noticeable, and in the latter part of childhood pulmonary tuberculosis becomes the more common and deadly form of the disease.

It would be improper to leave this subject with the thought that the only importance of disease in childhood is the number of deaths caused thereby. The affections of childhood assume a new and greater importance when we consider the number of those affected who are destined, by reason of the permanent damages produced by disease, to enter the battle of life with impaired vitality and possibly a crippled body. The waste, the suffering, the torture produced in this way is beyond computation.

David Bovaird, Jr.

References.

[1] Atwater and Bryant: Dietary Studies, U. S. Dept. Agriculture.
[2] Churchill: Arch. of Pediatrics, September, 1898.
[3] Holt: Diseases of Infancy and Childhood, 1897.
[4] Carriere and Morfet: Bull. de l'Acad. de Méd., 1897, p. 534.
[5] Bain: Education as Science.
[6] Spencer: Education.
[7] Oppenheim: Development of the Child.
[8] Bovaird: N. Y. Med. Journ., July 1st, 1899.
[9] Pauli: Berl. klin. Wochenschr., September 6th, 1897.

CHILLIES. See *Capsicum, sp.*

CHINAPHTOL.—$(C_{10}H_6OHSO_3H)_2,C_{20}H_{24}N_2O_2$. Betanaphtol alpha-monosulphonate of quinine. This is a yellow crystalline powder of bitter taste, insoluble in cold water, somewhat soluble in hot water and alcohol, and containing about forty-two per cent. of quinine. Riegler states that in the intestines it is decomposed into quinine and naphtol-sulphonic acid, and therefore is both an intestinal antiseptic and an antipyretic. He has used it with satisfaction in typhoid fever, dysentery, intestinal tuberculosis, and acute rheumatism, in daily dosage of .5 to 5 gm. (gr. viij. to lxxv.). *W. A. Bastedo.*

CHINASEPTOL. — $(C_9H_5,OH,SO_3H,N.)$ Diaphtol, ortho-oxychinolin-meta-sulphonic acid. This occurs in yellowish crystals melting at 295° C. (563° F.), and is slightly soluble in water, the solution turning green with ferric chloride. Chemically it bears the same relation to chinolin as phenol-sulphonic acid bears to benzol. It is used as a non-poisonous antiseptic or as a substitute for salol. *W. A. Bastedo.*

CHINO, EL. — Within the municipality of Ucareo, Michoacan, Mexico, there are several springs—Laguna Verde, Nopalito Marítaro, Laguna Seca, etc. The only one that enjoys any reputation is "El Chino," to which people resort when suffering from rheumatism, sciatica, and other disorders. Bathers are compelled to erect their own tents if they wish protection from the weather and the curious. *N. J. Ponce de Léon.*

CHINOIDINE. See *Cinchona.*

CHINOLINE.—Chinoline, or *quinoline*, as it is also called, is a non-oxygenated basic body represented by the formula C_9H_7N, and obtained by the distillation of certain natural alkaloids—notably quinine and cinchonine—with potassium hydroxide, and also, synthetically, by a patented process (Skraup's), from a mixture of aniline, nitrobenzol, glycerin, and sulphuric acid. An isomeric body—*leucoline*—obtained from coal tar responds to chemical tests differently from chinoline, and is to be regarded as a distinct compound.

Chinoline is a colorless limpid fluid, of alkaline reaction, forming, with acids, crystallizable salts. Of such salts, those of the so-called mineral acids are mostly too deliquescent for convenient medicinal use, but chinoline *tartrate* is free from this objection and is available as a medicine. Chinoline tartrate is in minute, white, silky crystals, which, in a specimen made by Merck, of Darmstadt, the writer found to be of a faint combined bitter-almond and coal-gas odor, of a peculiar, sharp, yet cooling taste, having a flavor as of kerosene with a *soupçon* of peppermint, and to be slowly soluble in about twenty-five parts of cold water.

The effects of chinoline tartrate are analogous to those of salts of quinine. In solutions ranging from 0.2 to 0.4 per cent. it has been said to inhibit fermentative and putrefactive processes (Donath), and in doses such as would be given of quinine, to prove antipyretic and antiperiodic after the manner of that alkaloid (Donath, Loewy, and others). As against quinine, chinoline tartrate has the advantage of comparatively low price; but the disadvantage of a decided tendency to sicken, vomiting being quite a common consequence of a medicinal dose. Furthermore, later experience has failed to confirm the claim of antiperiodic powers at first asserted. The drug is best given in a sweetened aromatic water, and a teaspoonful of lemon juice or a lump of ice after the dose is said to lessen the tendency to nauseate.

Neither chinoline nor any of its salts is official in the United States Pharmacopœia. *Edward Curtis.*

CHINOSOL.—$(C_9H_6NO,SO_3K + Aq.)$ Oxy-chinoline sulphonate of potassium. This is a yellow crystalline powder of feebly aromatic odor, freely soluble in water and insoluble in alcohol and ether. Its dilute aqueous solution turns green with ferric chloride, and forms a green coating on steel instruments. It is stated to be a more powerful antiseptic than bichloride of mercury, with great penetrating power, and is highly spoken of by European clinicians; a 1-to-500 solution killed the plague bacillus in ten minutes. It has been used with advantage by Gilles in vaginitis in strength of 1 to 8,000 to 1 to 1,000, also in leprosy and bone tuberculosis. Mixed with five to ten per cent. of boric acid it may be used as an antiseptic powder in place of iodoform. Hobday found it a powerful disinfectant for the hands, the site of operation, and sutures, a solution of 1 to 60 producing no irritation. For cellulitis or other severe infection it should be used in strength of 1 to 500, but for ordinary use 1 to 1,000 is better. Cipriani recommends it by mouth and hypodermically for tuberculosis. It has also been used as an antipyretic. Hobday's experiments on cats indicate the limit of safe dosage to be .0037 gm. (gr. $\frac{1}{16}$) per 500 gm. (1 lb.) of body weight. Cadavers are said to be effectively preserved by intra-arterial injection of five-per-cent. solution.

Pulvis chinosol comp. consists of chinosol, chinaseptol, talc, and silica. *W. A. Bastedo.*

CHIRATA.—*Chiretta.* "The entire plant, *Swertia Chirayita* (Roxb.) Hamilton (fam. *Gentianaceæ*)" (U. S. P.) (It is spelled "Chirata" by Hamilton.) The following is the official description of this herb:

"Root nearly simple, about 7 cm. long; stem branched, nearly 1 metre long, slightly quadrangular above; containing a narrow wood circle and a large yellowish pith. Leaves opposite, sessile, ovate, entire, five-nerved. Flowers numerous, small, with a four-lobed calyx and corolla. The whole plant smooth, pale brown, inodorous, and intensely bitter."

Special attention should be given to this large pith, as there is a spurious article which is destitute of it, being quite hollow.

Chirata is a native of Northern India, especially in mountainous districts in Nepal, where it is found at an elevation of from five to nine thousand feet (Bentley and Trimen). Its use was introduced from India, where it has been long employed, into European medicine about fifty years ago.

The plant is gathered when fully grown; the flowering stems being pulled up entire, dried, and tied into long bundles.

In composition, Chirata is almost the exact equivalent of gentian, as it is also in properties and uses. Bitter *ophelic acid* ($C_{13}H_{20}O_{10}$), soluble in both alcohol and water, replaces the gentisic acid of the latter, *chiratin* ($C_{26}H_{18}O_{15}$), a yellow, bitter, crystalline glucoside, soluble in warm water and alcohol, replaces gentiopicrin, and as with gentian, there is no tannin, though ferric salts produce a dark color, without inky precipitate.

Chirata is a simple bitter and tonic. We have official a fluid extract, dose 1 to 4 c.c. (fl. ʒ ¼ to i.) and a ten-per-cent. tincture, made with sixty-five-per-cent alcohol, dose 1 to 8 c.c. (fl. ʒ ¼ to ij.). The latter is much the better preparation, especially in small doses.

Henry H. Rusby.

CHIROL is a solution of various oils and resins in ether and alcohol, forming an antiseptic varnish for the surgeon's hands. It is applied by immersing the hands, opening and shutting them a few times and spreading the fingers, then exposing them to the air for two or three minutes to dry. The pellicle formed is said to wash off easily, not to peel or crack, and not to be sticky. It covers the hands with a flexible, impermeable coating like a rubber glove. It has also been used for preliminary sterilization of the surface to be operated upon.

W. A. Bastedo.

CHITTENANGO SULPHUR SPRINGS. — Madison County, N. Y.

Post-Office.—Chittenango.

Access.—This pleasant summer resort is located about 3 miles south of the Chittenango station, on the New York Central and on the New York, West Shore, and Buffalo railroads, between the beautiful villages of Chittenango and Cazenovia. The Springs are reached from Chittenango by an electric railroad, by carriage, and by a stage line.

The country surrounding the Springs is hilly and covered by a growth of hemlock, pine, beech, and maple. Through the valley between the hills flows the outlet of Cazenovia Lake to Oneida Lake, affording a stream twenty to seventy feet in width and well stocked with California, German, and brook trout. The hotel is large and commodious, with extensive verandas, spacious parlors, and high and well-ventilated rooms, capable of accommodating three hundred guests. The hillside grounds, in the rear of the hotel, including several acres, are covered with wild woods, intersected with walks, affording a cool and delightful strolling place in hot summer days. The Springs are three in number, known as the "White Sulphur," the "Magnesium Sulphur," and the "Lithium Sulphur" Springs. The following analyses were made by Professor Chandler, of New York:

One United States Gallon Contains:

Solids.	White Sulphur Spring. Grains.	Lithium Sulphur or Cave Spring. Grains.	Magnesia Sulphur Spring. Grains.
Magnesium carbonate	22.02	23.97	
Iron carbonate	.....	.....	20.78
Iron bicarbonate	.08	.16	.32
Sodium hyposulphite	.....	.26	.02
Sodium sulphate	.21		
Calcium sulphate	81.42	106.12	115.09
Strontium sulphate	Trace.	Trace.	Trace.
Magnesium sulphate	1.95	7.59	12.72
Sodium chloride	1.04	1.57	1.83
Potassium chloride	.16	.23	.33
Lithium chloride	Trace.	Trace.	Trace.
Sodium sulphide	.12	.39	.75
Calcium sulphide	.....	1.12	.33
Alumina	.08	.22	Trace.
Silica	.28	.52	.58
Total	107.36	142.15	153.35
Gases.	**Cubic ins.**	**Cubic ins.**	**Cubic ins.**
Sulphureted hydrogen	0.88	2.75	5.62
Carbonic acid	20.48	15.93	19.43

Temperature of water, 45° F.

The water of the White Sulphur Spring also contains a trace of free sulphur, which accounts for its pearly-white hue. This water is recommended for rheumatism, neuralgia, gout, and skin diseases. The magnesia water is transparent, but deposits a sediment said to consist of magnesia, yellow sulphur, and a chloride of potassium. This water possesses marked tonic properties, and is much used in general debility, nervous affections, and insomnia. The water of the Lithium Spring is also perfectly clear and very pleasant to the taste. It has enjoyed much reputation in the treatment of kidney affections. There is a large bath-house in connection with the Springs, in which hot mineral water, vapor, and electric baths are furnished. *James K. Crook.*

CHLOASMA.—(Synonyms: Liver Spot, Moth Patch, Mask; Fr., *Chloasme*; Ger., *Pigmentflecken.*)

Definition.—An abnormal pigmentation of the skin