

in origin but in general symptoms. Instances of congenital lymphangiectatic macroglossia and macrocheiria are occasionally met with. Cases of circumscribed lymphangiectasis of the skin are also sometimes encountered, and from their resemblance to tumors they are classified as lymphangiomas. Well-defined elephantiasis due to congenital causes is not frequent in temperate climates.

Typical instances of the malady in tropical countries have been made the subject of interesting monographs by Moncorvo, of Rio de Janeiro, in which he graphically depicts the facial and manual deformities. He discovered the presence of streptococci in the blood and he believes that they were the exciting cause. They found their way into the maternal circulation, as he believes, through the placenta, from a previous injury to the abdomen. Some authorities attribute the development of this peculiar disease to the filaria or its embryos, others regard it as the result of hereditary syphilis.

In a sporadic case which was reported by Dr. Ernest Wende, and which developed in intra-uterine life, it was found, upon microscopic examination, that the connective tissue of the skin was greatly thickened, especially in the papillary layer; the sweat glands were distorted; the muscles had undergone fatty degeneration; the walls of the blood-vessels were thickened and

some of them were obstructed. Similar changes were met with in the lymphatics. The lymph spaces were enlarged and dilated. Round-cell infiltration was present. No filariae or embryos were found. It was concluded that the etiology of this disease is not subject to a single law, as now held by some authorities, but is due to several distinct causes. Fig. 1859, copied from a photograph, shows the gross manifestations of the disease in this particular case.

ETIOLOGY.—This affection occurs at all ages, but is especially found in connection with adult life. It attacks both sexes, but the male sex in the ratio of four to one, a fact undoubtedly due to greater liability to exposure. It is developed in all countries and climates, but is more commonly found in the island and coast territory of tropical and subtropical regions. In the endemic form, it most frequently occurs among the natives. Sir Joseph Fayrer states that in India, if the disease occurs among Europeans, it is always among those who possess an ad-

mixture of native blood. On the other hand, Manson says that racial peculiarities do not play a vital part in the problem, but that the Europeans, owing to their education and habits, are less exposed and therefore less liable to contract the disease.

Many observers emphasize the possibility that heredity is either the direct cause of the endemic variety of the disease, or that it creates a predisposition to it and enters into the problem as a factor. In support of this theory, it has been observed that the disease has existed in the

same family for several generations. It should be borne in mind, however, that the individual members of such families are usually exposed to the same general influences of climate, habits, and mode of living. Moisture, damp and swampy regions, and unhygienic surroundings in general may have a bearing upon the etiological relations of the disease, inasmuch as such conditions are allied to the habitat of the mosquito; this especially applies to the poorer classes. While the disease is often found in mountain districts, rapid changes of temperature and exposure to the sun or damp are more frequent causes.

The question whether elephantiasis is not a specific disease depending upon a specific cause—for instance, a true parasite—has been freely discussed by Carter, Lewis, and Ban-

croft, and especially by Manson. In the endemic variety such a connection has been established, and it appears that its existence is associated with the *Filaria sanguinis hominis*, known to exist in malarial districts, and which readily finds a habitat in the blood-vessels and lymphatics. There is a strong probability, according to Manson, that the disease owes its origin to a certain species of mosquito. Quite recently, Dr. Low and Capt. James, while working with mosquitoes, claimed to have discovered that these belong to the genus *Anopheles* as well as the genus *Culex*, and that the former more frequently acts as an intermediary host.

In considering the etiology of the sporadic variety, we are able to gain a clearer comprehension of the disease, one which includes all the pathological factors producing lymphangitis and all kinds of atypical forms of inflammation, especially erysipelas. The question arises whether these repeated attacks of inflammation constitute a true erysipelas, or a lymphatic process peculiar

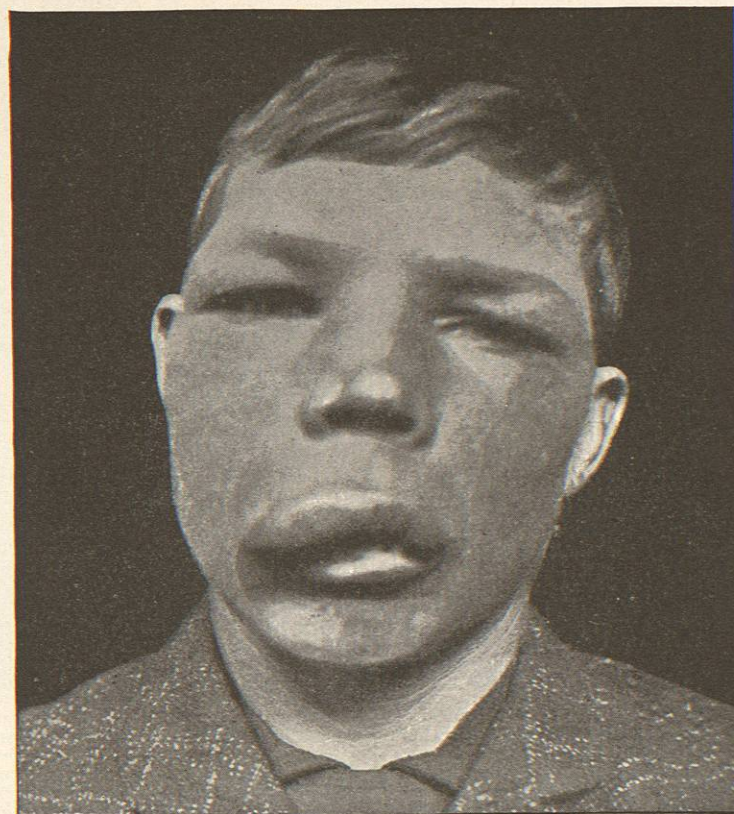


FIG. 1858.—Elephantiasis of the Upper Lip and Portions of the Face. (Hyde and Montgomery.)

to elephantiasis alone. The consensus of opinion is that the streptococcus discovered in several cases corresponds to a specific cause different from that which produces genuine erysipelas. However, a true erysipelatous condition may precede elephantiasis, if the local conditions are favorable, as is often the case when ulcers, fissures, or lymph fistulae are present. It is difficult to ascertain the cause of the many cases of elephantiasis that occur sporadically in our climate, for the affection is apparently occasioned by various factors, favoring the theory of a

recurrent inflammation and obstructions of a lymphatic edematous character. For instance, when the disease begins in the lower extremity, any local process or factor calculated to impede the venous circulation—as by compression from scars, or by means of a thrombus resulting from a phlebitis, or even by means of a frost-bite—may possibly give rise to the difficulty. In fact, it may be caused by any decided inflammation of the soft parts. To the last-named category chronic eczema, syphilis, lupus, ulcers, and fistulae especially belong.

PATHOLOGY.—The pathology of this malady is peculiar in that, irrespective of the specific causes,—of which there are a number,—the resulting changes are invariably the same.

The peculiar characteristics are a cell proliferation and hypertrophy which involve in a varying degree all the structures of the affected parts. Implication of the fibrous tissue constitutes, perhaps, the most prominent feature of the disease and produces the bulk of the mass, the process involving the true skin, blood-vessels, lymphatics, and the structures of the nervous and muscular systems. The various layers of the skin become so matted by reason of the enormous increase in the fascicles of the fibrous tissue that they can hardly be distinguished. The corium is greatly thickened and indurated, and in certain localities the process is so marked as to produce verrucous elevations. The sebaceous and sweat glands, as well as the hair follicles, are at first usually unchanged, but subsequently are widely separated or, in consequence of hypertrophic pressure, become atrophied and scarcely perceptible, often plugged and their walls thickened. The fascia and intermuscular septa are greatly augmented, and present evidence of fatty degeneration. Upon section, the parts show the hypertrophic tissue to be fibrous, lustreless, sclerotic, and homogeneous, and a lymph-like fluid exudes. In certain cases dilated lymph pockets appear, from which lymph or chyle escapes, supposed to result from the obstruction of one or more large lymph trunks.

Tropical elephantiasis is now known to be caused by the partial or complete obstruction of some lymphatic vessel or gland by the filaria or its embryos, these having

been discovered in the peripheral lymph vessels, in many cases involving the scrotum and lower extremities. The question of its being a parasitic disease, particularly in that form which is found in hot countries, has been fully discussed by Wucherer, Lewis, and especially by Manson. The filaria has been found in those suffering from other diseases, both in man and in some of the lower animals, but without causing any apparent inconvenience. It exists in some cases without reaction and without any evidence of elephantiasis. In view of these facts, therefore, the

evidence that the filaria is in itself the exciting cause of the disease is not complete. All we can say is that it represents one of the many causes which may develop the disease in hot countries when other etiological factors are present.

The adult male and female filariae that gain entrance to the lymphatic vessels, thus causing a stasis of the lymphatic fluid of, which elephantiasis is the consequence, measure, respectively, the male 83 mm. in length by 0.407 mm. in thickness, the female 155 mm. in length by 0.715 mm. in thickness, while their embryo measures 14 mm. by 0.038 mm. In appearance the parasite is long, smooth, round, and opaline. According to the opinion of Manson, the parent worm occupies some portion of the lymph channel, at which place its ova are discharged, to wander through the lymph glands and general circulation. These embryos have a diameter scarcely larger than that of a lymph corpuscle. Manson states that they are abstracted from the blood by the mosquito, and by it introduced

into the water stream, which ultimately affects man through contamination. Filaria embryos disappear periodically from the blood and reappear in the same individual, this phenomenon depending on the habits of the host. It has been ascertained that during the day the filariae are absolutely wanting in the blood, while in the evening and at midnight they are largely in evidence. The presence of filariae may also depend upon the nocturnal habits of the mosquito. It has not been shown with absolute certainty whether the filariae which appear during the night come in freshly from the lymph vessels and then die, or whether they assert themselves alternately in the blood and lymph. The discovery of filariae in the blood depends very much upon the precise time of examination, which often proves to be negative. So long as the patient is active, no specimens of the parasite are likely to be discovered; but usually a moderate number of embryos can be found after the patient has been in bed for a short time.

TREATMENT.—In the endemic type, in order to secure immunity from filarial complications, prophylaxis is important. The drinking-water, unless collected in cisterns



FIG. 1859.—Congenital Elephantiasis. (Dr. Ernest Wende.)

that are protected from mosquitoes, should be filtered or boiled. In sections favorable to the disease, the individual should always sleep under netting. In suspicious cases, remedial measures should be promptly applied to all injuries received. All cases may be greatly benefited by a change to a country that is free from malarial and

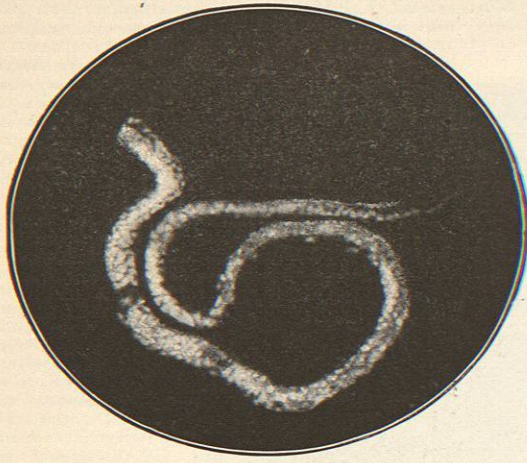


Fig. 1860.—*Filaria Sanguinis*. (Photomicrograph by Dr. Harvey R. Gaylord.)

miasmatic influences; for it has been observed that even if the disease is far advanced the severity of the paroxysmal attacks will be lessened by the removal to a different country.

Surgical interference of one kind or another has never accomplished any definite result in these cases. That the embryos which are usually lodged in the glandular structure, after being hatched, enter the general circulation of other portions of the body, is capable of demonstration.

The measures commonly adopted in connection with this condition, especially when preceded by chills and fever, are such as will most successfully combat inflammatory processes. The effect of such remedies will be to counteract the fever, lessen exudation, and diminish stasis. The medicines generally employed for this purpose are quinine, salines, phenacetine, or any other suitable antipyretic, while soothing and astringent lotions, like lead-water and opium, zinc oxide, and boric acid may be applied locally until the inflammatory action has subsided. After the intercurrent attacks, tonics, such as iron, cod-liver oil, strychnine, and mineral acids, may secure beneficial results.

The sporadic cases which are met with in our country are best treated by counteracting the cause. If the disease is the result of an ulcer on the leg, this should be promptly healed, its excrescences removed, and the limb maintained in an elevated and horizontal position. Afterward it should be methodically compressed with a rubber bandage. The toes should be separately enveloped, then the foot and ankle, and lastly the leg, so as to diminish the edema. When elephantiasis of the leg has reached such proportions that bandages no longer serve, ligation of the arteria femoralis and of the iliaca externa must be resorted to. In certain instances these measures have proved effective and they should be tried in extreme cases. In acute attacks the parts may be punctured—in order to lessen the effusion by providing an escape for the fluid—and antiseptically dressed with an astringent lotion or ointment.

In a few instances nerve-stretching and partial excision of the sciatic nerve have been followed by beneficial results. In elephantiasis of the scrotum the removal of the

offending mass by the knife sometimes becomes indispensable. The mortality resulting from heroic treatment is comparatively small. Before operating, Fayerer recommends drawing off the blood by placing the patient on his back, elevating the tumor and compressing it with an elastic bandage. The incision is to be made alongside of the cord and at the root of the penis. The skin is reflected and the cord, testicles, and penis protected by turning them out; the mass is then quickly removed, only a few bold incisions being required.

The female genitals, almost without exception, demand surgical interference. For this purpose either the knife or the galvano-cautery may be employed. The latter method is simply and especially adapted to cases of hypertrophied labia. Amputation of the leg has also been resorted to, but the operation has not been characterized by the same success as has attended it in other regions affected by the disease.

Prognosis.—The prognosis largely depends not only upon the particular form of the disease, but upon its complications. It is evident from what has been said that the disease is not necessarily fatal—even the endemic variety vastly improves under a change of climate. This is likewise true of sporadic cases. Both surgery and medicine have rendered even aggravated cases comparatively curable. The duration of life is not usually shortened by elephantiasis, since it exerts no detrimental influence upon the general constitution. Death rarely ensues from it except in those cases which involve supuration or septic infection.

The necessary literature relating to this subject is to be found in the following books: A. von Sniawarter: "Chirurgischen Krankheiten der Haut"; Hyde and Montgomery: "Diseases of the Skin," "Twentieth Century Practice of Medicine," vol. iv.; "Albutt's System of Medicine," vol. ii.; "La Pratique Dermatologique," vol. ii.; and the London Lancet and British Medical Journal, 1880 and following years. *Grover W. Wende.*

ELGIN SPRINGS.—Addison County, Vermont.
Post-Office.—Vergennes. Boarding-houses.

Access.—Via Vermont Central Railroad to Vergennes, thence three miles south by stage. This resort is pleasantly located in the Champlain valley, surrounded by beautiful scenery and delightful drives. The summer temperature generally ranges from about 50° to 70° F., and the weather is usually clear and bracing. The following analysis of the springs was made in 1889 by Henry M. Sully, of Middlebury College:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Silica	1.19
Calcium	24.61
Magnesium	25.10
Sodium	11.30
Chlorine	.34
Sulphuric acid	87.65
Carbonic acid	1.08
Iron	Traces.
Total	151.27

Temperature when drawn, 45° F. The compounds formed by these acids and bases have not been designated by the chemist, but it can readily be seen that they would consist largely of sulphates with an admixture of carbonates and chlorides. The water contains a considerable proportion of sulphate of magnesium and some sulphate of sodium which gives it a cathartic effect. It resembles the waters of Seidlitz and Pullna in Bohemia and is valuable in chronic constipation and in blood disorders. The water is slightly opalescent when fresh, faintly alkaline to test paper, and odorless. It becomes perfectly clear after standing. *James K. Crook.*

ELM, SLIPPERY.—ULMUS, ELM BARK. "The dried inner bark of *Ulmus fulva* Mx. (fam. *Ulmaceae*)" (U. S. P.). This is a smaller and less graceful tree than the common "American," or white elm, *U. Americana*, which it in general resembles. It is a moderate-sized tree, with a

brown, rough bark, and soft, but tough, red wood. The leaves are larger and thicker than those of the common elm, and rough or pubescent beneath, and the fruit is twice as large. The expanding buds and smallest twigs are velvety. The inner bark of most elms, as well as of many other species in the order (nettles, hemp, etc.), is very pliable and tough; that of the present species is also very mucilaginous, and is valued on this account.

This is a common tree in the United States, especially in the central portions; but the demand for its bark has exterminated it from many regions, which suggests the question whether it could not be collected in such a way as not to destroy the tree, as is done with the barks of cinchonas in India.

The bark should be collected in the spring. It is "in flat pieces, varying in length and width, about one-eighth of an inch (3 mm.) thick, tough, pale, brownish-white, the inner surface finely ridged; fracture fibrous and mealy; the transverse section delicately checkered; odor slight, peculiar; taste mucilaginous, insipid." It contains no starch, a fact which affords an excellent means of detecting the numerous starchy adulterants of the ground bark.

Slippery elm bark is remarkable for the abundance of mucilage which it imparts to either cold or hot water, making a nearly transparent, thin, jelly-like, but not filterable solution. It is precipitated by neutral acetate of lead. The addition of strong alcohol to the concentrated mucilage abstracts a portion of its water without coagulating it.

The employment of slippery elm is said to have been learned from the aborigines. In medicine it is used as a pleasant demulcent, like other gums and mucilages; in sore throats, diarrheas, dysentery, inflammation of the bladder, etc.; also as a poultice. It is a very mild agent, and has hardly any value, excepting that of an unirritating protection to the parts it reaches. The crude bark, chewed and swallowed in large quantity, has been the mechanical cause of serious consequences in one or two cases.

ADMINISTRATION.—The powdered bark, stirred into hot water, is sometimes used as a demulcent drink. It, of course, includes the woody dust, and is an unsightly mixture. The official mucilage (*Mucilago Ulmi*), made from the sliced bark and strained (six per cent.), is much better. Dose indefinite. The powder can be used for poultices. It is often mixed with flaxseed for this purpose.

ALLIED PLANTS.—Several other elm barks are mucilaginous, but none so much as this. The European elm (*Ulmus campestris* L.) is official in several countries. *W. P. Bolles.*

EL PASO DE ROBLES HOT AND COLD SULPHUR SPRINGS.—San Luis Obispo County, California. Hotel and cottages.

These springs lie in the beautiful valley of the Salinas River, about 16 miles from the shores of the Pacific Ocean and 216 miles from San Francisco. They are reached by the Southern Pacific Railroad via Soledad. Access may also be had from San Luis Obispo by stage. The name of El Paso de Robles is derived from the Spanish, meaning "the pass of the oaks," from the fact that the main highway ran through this valley. For many miles this picturesque valley is covered with gigantic white oak, live oak, and cottonwood trees, and nestled in one of these cosy groves is Paso Robles Retreat. The once wild "pass in the oaks" is now transformed into a blooming resort, with cultivated grounds, and Paso Robles is a delightful little town of about a thousand inhabitants. When the Southern Pacific Railroad is completed the place will become of considerable commercial importance. Near the springs and overlooking the prosperous little town a commodious and elegant hotel is under construction. The building is of solid brick throughout. Some eighteen or twenty cottages are also found under the umbrageous oaks in different parts of the extensive grounds. On each side of the resort and valley the evergreen hills covered with forests of pine, oaks, manzanita

groves, and sweet-scented shrubbery, form a pleasant contrast to Paso Robles proper. The climate is remarkably mild and delightful all the year round, and the atmosphere is pure, balmy, and invigorating. The waters of Paso Robles are sulphurous and alkaline and range in temperature from 59° to 122° F. They comprise the "Main Hot Sulphur" spring, the "Mud" or "Moor" spring, the "Soda," "Sand," "Cold," "White Sulphur," "Iron," and "Garden" springs. The great hot sulphureted spring is located about three hundred yards from the hotel in a southeasterly direction. Over it has been constructed one of the finest bathing establishments on the coast, consisting of sixty individual bath-tubs, and a large vat, fifteen by thirty feet, for a swimming or plunge bath. The flow of this spring is about five thousand gallons per hour, and it has a temperature ranging from 105° to 110° F. The following analysis was made by Dr. Winslow Anderson in 1889:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Sodium chloride	25.73
Sodium bicarbonate	41.19
Sodium carbonate	7.62
Sodium sulphate	7.25
Sodium iodide	Trace.
Sodium bromide	Trace.
Potassium chloride	1.57
Potassium carbonate	2.05
Potassium iodide	Trace.
Potassium sulphate	Trace.
Magnesium carbonate	2.15
Magnesium sulphate	5.11
Calcium carbonate	1.23
Calcium sulphate	2.94
Ferrum peroxide	.73
Borates	Trace.
Lithates	Trace.
Alumina	.25
Silica	1.73
Iodides and bromides	Trace.
Organic matter	1.90
Total	101.47
Gases.	Cu. in.
Free sulphureted hydrogen	3.75
Free carbonic acid gas	8.90

These waters are found to be especially serviceable in subacute and chronic rheumatism and articular affections, in blood, glandular, and cutaneous affections, and in strumous cases. In catarrh of the naso-pharynx the water, used as a hot douche, has proved beneficial. It may also be used to advantage, in the form of a hot douche, in the treatment of leucorrhoeal discharges and in engorgement of the female pelvic organs. The mud springs, about a mile and a half north of the hotel, are of decided benefit in rheumatism, arthritis, stiff joints, sprains, synovitis, glandular enlargements, chronic cutaneous diseases, etc. They range in temperature from 104° to 122° F., and have been found to be highly charged with mineral and gaseous ingredients. The mud springs cover a space of about twenty-five feet square, over which suitable bathing facilities have been established. These consist of dressing-rooms, hot sulphurous water plunges, and the mud bath. This latter is a compartment or vat four by eight feet and nearly filled with prepared moor or mud, and so arranged that the hot sulphurous water and gases rise directly into it from the ground beneath. The mud springs flow collectively about six thousand gallons per hour. About two hundred yards north of the mud baths is the Soda Spring. Its temperature is 77° F., and its flow is limited. The water is much used for drinking purposes. By allowing a small quantity of sulphureted hydrogen to escape the water becomes very palatable. According to Anderson's analysis,

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Sodium chloride	25.10
Sodium carbonate	7.25
Sodium bicarbonate	19.70
Sodium sulphate	5.05
Potassium carbonate	1.16
Potassium sulphate	.83