

The investment on the dorsal surface is not usually so complete. The strengthening bands are mainly two—the rhomboid ligament, passing downward and inward from the lower end of the radius to the cuneiform and unciform bones, and the transverse dorsal ligament, extending from the scaphoid outward to the same. There is also a dorsal radiate ligament diverging from the os magnum.

The only other joint requiring especial mention is that of the metacarpal bone of the thumb with the trapezium. This is an excellent example of the joint by reciprocal reception, sometimes termed the saddle-joint. Its motions are freest in two directions, which correspond to the motions of adduction and abduction on the one hand, and of the various adjustments of opposition on the other.

Frank Baker.

WRIST-DROP. See *Lead Palsy*.

WRITERS' CRAMP. See *Hands and Fingers, etc.*

WRY-NECK. See *Torticollis*.

XANOL is sodium caffeine salicylate, a diuretic of considerable power, with very little of the caffeine effect on heart and nervous system. Dose, 0.3-1 gm. (gr. v.-xv.).

W. A. Bastedo.

XANTHELASMA, XANTHOMA. See *Eye, Tumors of*.

XANTHORRHEA RESIN.—*Resina lutea*; *Acaroides Gum or Resin*; *Botany Bay Gum or Resin*. By these names are designated several closely related solid balsams, obtained in Australia from species of *Xanthorrhoea* (fam. *Liliaceae*).

The resinous sap exudes spontaneously, and hardens upon the stem in tears or masses. Two principal varieties of the "gum" are distinguished: the red, in deep lumps or fragments resembling lumpy specimens of dragon's blood, having a weak odor of benzoin, and a spicy cinnamon-like taste; the yellow, in orange-yellow pieces or tears, having a strong benzoin odor.

The balsam contains, besides some bassorin and uninteresting ingredients, a large proportion of *cinnamic acid* and some *benzoic acid*. When it is decomposed with melted potash, parabenzoinic and protocatechuic acids, pyrocatechin and resorcin are formed. In nitric acid the balsam dissolves readily, and yields abundance of picric acid, together with oxalic and nitrobenzoic acids.

The *xanthorrhoea* resins have long been used in Australia as a remedy for gastric troubles, intestinal catarrhs, diarrheas, etc., and are occasionally prescribed in this country for similar conditions; but their principal uses are in the arts as a source of picric acid, and in the manufacture of lacs and varnishes.

Dose, from 0.5 to 1 gm. (gr. viij. ad xvi.). It may be given in alcoholic solution.

W. P. Bolles.

XANTHOXYLUM. See *Ash, Prickly*.

XERODERMA. See *Ichthyosis*.

XEROFORM. See *Tribromphenol bismuth*.

XEROSTOMIA. See *Parotid Gland, Diseases of*.

X-RAYS. See *Roentgen Rays, etc.*

XYLOL.—A hydrocarbon, or mixture of isomeric hydrocarbons of the composition $C_8H_{10}(CH_3)_2$, occurs as a constituent of coal-tar, and is known as *xylol* or *xylene*. This substance is principally *metaxylene* (*metadimethylbenzene*), with a certain proportion of *paraxylene* (*paradimethylbenzene*), and possibly some other hydrocarbons. Pure metaxylene can be obtained by special processes. Xylol is a thin, colorless fluid of a faint odor, reminding somewhat of that of benzene, and of a burning taste. It is insoluble in water, but soluble in alcohol. Medicinally, xylol has been used in the treatment of smallpox, and had at one time an ephemeral, but undeserved, reputa-

tion as a remedy for the disease. It was administered internally in doses of from ten to fifteen drops, in emulsion, and was also applied locally to the throat. It is now obsolete as a medicine.

Edward Curtis.

YADKIN MINERAL SPRINGS.—Stanley County, North Carolina.

POST-OFFICE.—Palmer'sville. Boarding-houses.

ACCESS.—Via Southern Railroad to New London, thence six miles by private conveyance to springs.

This resort is charmingly located in a wild and picturesque region penetrated by the Yadkin River, and covered by the Oconosee Range of mountains. Like the usual North Carolina mountain climate, the atmospheric conditions prevailing in this section are eminently conducive to good health and longevity. The rainfall at the springs is about fifty-three inches annually, and is quite uniformly distributed through the seasons. There is no hotel, but during the season, from May to November, accommodations may be obtained at a reasonable rate in a number of private boarding-houses. The springs are two in number, a chalybeate spring yielding sixty gallons of water per hour, and a sulphur spring flowing at the rate of one hundred and eighty gallons per hour. No qualitative analysis is available. Much beautiful scenery is found in the neighborhood of the springs; the falls of the Yadkin River, the Narrows, and the "Devil's Den," a great cave in the hills, being the most prominent.

James K. Crook.

YARROW.—*Achillea, Milfoil*. *Achillea* L. (fam. *Compositae*) is a genus of more than one hundred species, several of which, from ancient times, have been used in domestic and professional medicine. The most important of these is *A. millefolium* L., the herb of which is used. It is a perennial plant, indigenous to Asia and Europe and largely naturalized (or perhaps native) in North America. Its active principles are a very small amount of a volatile oil, and the bitter glucoside *achillein*. Aconitic acid also occurs, with considerable tannin, a little gum and resin. The drug is to be classed as an ordinary aromatic bitter, somewhat like chamomile. The dose varies from 0.3 to 2 gm. (gr. v. to xxx.).

Henry H. Rusby.

YAWNING.—(Synonyms: Gaping, Oscitation; Germ., *Gähnen*; Fr., *Bâillement*.)

DEFINITION.—Yawning is a physiological modification of respiration by which the act is intensified. It consists in an involuntary, forcible, and profound inspiration, followed by a pause and a prolonged expiration. When fully developed, it is accompanied by a wide opening of the mouth, an elevation of the velum palati, and depression of the larynx, a roaring sound, and usually a click in each ear, a flow of saliva, and a suffusion of the eyes with tears, and a more or less imperative impulse to extend the limbs, especially the arms (pandiculation), to bow and twist the trunk, and to throw back the head. The inspiratory act is frequently audible, and the expiration usually acquires a distinct blowing sound. The elevation of the palate closes the posterior nares and causes the air to be admitted wholly through the mouth. In the same way the Eustachian tubes are closed, causing momentary obtunding of hearing. The contraction of the palatal muscles often precedes the opening of the mouth, and tends to persist for a moment after its closure. The commencement of their contraction is not infrequently accompanied by a rapid succession of three or four short, broken inspiratory efforts.

PHYSIOLOGY.—Yawning is a physiological expression of fatigue and a disposition to sleep. It may, however, arise from a retardation of the respiration, or from any influence which will impair the oxygenation of the blood. It is frequently, therefore, a product of melancholy, languor, ennui, torpor, or debility, or of the malaise which precedes the onset of disease. It is liable to follow prolonged abstraction of mind or concentration of thought. It is sometimes the result of feeble or laborious digestion,

of gastralgia, or of other disorder of the digestive organs; or it may occur in response to a demand for increased activity of circulation. It may be sympathetic. To some individuals it is habitual, occurring without fatigue, and being but the outgrowth of the lassitude or indolence of their natures. It may sometimes be attributed to the possession of an inferior degree of intelligence, a slothful, inactive, effeminate, timid, or lustful disposition incapable alike of vigorous mental exertion or of prolonged physical activity.

That yawning may be the response to a demand for increased activity of oxygenation in the lungs is demonstrated by placing an animal in an irrespirable atmosphere. Repeated yawning occurs shortly before the animal succumbs to asphyxia. The phenomenon is therefore usually explained on the supposition that it is due to a stimulus transmitted from the central nervous system in response to a peripheral impression, in most cases arising, in part at least, from the respiratory apparatus. Longet has attributed it to the accumulation of too great a quantity of venous blood in the right side of the heart, whence the peripheral impression is supposed to proceed. From whatever source we derive the peripheral impression, however, the act is generally admitted to be reflex in character. Of the reflex nature of the stimulus which produces the muscle contractions in the extremities, there can be no doubt; for it is a matter of repeated observation that the hand which, owing to paralysis, has been for years beyond control of the will, and has become firmly contracted by post-paralytic rigidity of its flexor muscles, will often become distended during yawning. It is evident here that the stimulus can emanate only from the spinal centres.

The mechanism of yawning is the same as that of normal respiration; the same muscles are called into action, but their movements are more extended. (See *Respiration*, Vol. VI.) The diaphragm, the scaleni, the sternocleidomastoids, the clavicular portions of the trapezii, the lesser pectorals, the subclaviculars, the external intercostals, the serrati magni, the rhomboids—in fact, all the muscles which normally act as direct or as auxiliary forces in the full expansion of the chest, take part in the inspiratory movement; and all the muscles of forced expiration are called into action in the expiratory stage. In the fully developed yawn there is the action also of the muscles of the face, the depressors of the lower jaw, the dilators of the nostrils and upper lip, the orbicularis palpebrarum, the zygomatics, and of the depressors of the hyoid bone and larynx, and finally of the muscles of the back in the bowing of the trunk, and of the extensors of the extremities when stretching occurs.

Yawning is involuntary. It begins without the sanction of the will, and, once begun, it cannot be arrested. In this it resembles sighing, sneezing, hiccough, and other modifications of respiration, without, however, possessing their full spasmodic quality. Yet the will is not entirely deprived of influence over it; for a yawn may be often in a measure concealed by a forcible effort at closure of the jaws, and the mouth may be performed by the will, though not completely; and is one that is particularly excited by an involuntary tendency to imitation, as every one must have experienced who has ever been in company with a set of yawners.

After yawning there is usually a momentary pause in the respiratory movements, followed by normal, tranquil breathing. The forced respiration has not only supplied the blood with its needed oxygen, but, aided by the muscular contractions, has removed venous engorgement and accelerated the systemic circulation. At the same time, a moment's relaxation has been given to the fatigued body, and a sense of relief is usually afforded.

SYMPTOMATOLOGY.—The value of yawning as a symptom has been at different times very differently estimated. Hippocrates recognized it as a precursor of a fever, particularly of intermittent fever. From its frequency and

intensity he prognosticated the severity and duration of the disease. Yawning, with suffusion of the eyes and pandiculation, was in early times among the most valued factors in the diagnosis of the eruptive fevers. Occurring during parturition, it was an evil omen. Roederer, in 1759, believed that he had observed a death from it. The yawning of the infant was also a cause for solicitude.

It is now comparatively seldom, however, that we think of yawning as more than an indication of fatigue and a precursor of sleep, or of lassitude and a lazy disposition. But that it may denote a diseased state of the system is a well-recognized fact. As indicative of fatigue, it may be a symptom of profound mental or physical exhaustion. It may, in fact, of itself constitute a morbid condition of spasmodic nature and of grave import. It is not infrequently indicative of a deficient oxygenation of the blood, especially when it is associated with the dyspnea which results from the lung consolidation of fibrinous pneumonia, the lung compression of hydrothorax or pneumothorax, or after profuse and exhausting hemorrhages. In the latter connection, it is at times a valuable factor in the diagnosis of concealed hemorrhage.

Modern experience has but confirmed the observations of the ancients with regard to the occurrence of yawning in the prodromal stage of fevers, particularly of the intermittents. In these, as also in such neurotic affections as epilepsy, hysteria, catalepsy, and somnambulism, frequent gaping often signifies the immediate supervention of a seizure. When it occurs during the course of a disease it not seldom indicates the approach of resolution or of a crisis. It is so frequently observed during parturition, however, as a consequence merely of fatigue, that no great significance is now attached to it.

As a symptom of feeble or suppressed menstruation in anæmic young girls, it is probably in most instances a manifestation of hysteria, so often a complication of this disorder. It is probable also that many of the reported cases of spasmodic yawning have been of hysterical origin. Nevertheless, cases have been reported in which yawning of a spasmodic character developed without hysteria, and resembled whooping-cough, spasmodic laughing, crying, sneezing, etc. Of a reflex nature, the affection may be indicative of various disorders of the central nervous system, particularly of cerebral anæmia, of circulatory disturbances in the medulla oblongata, or it may occur in the wake of cerebral hemorrhage. It also shows a predilection for individuals who, from necessity, are confined to small, closely crowded work-rooms, and for convalescents from neuralgic affections, especially cardialgia and hemicrania.

To the surgeon yawning is of interest chiefly on account of its occasionally producing luxation of the lower jaw. The mechanism of this accident is considered under *Dislocations*, in Vol. III. James M. French.

YAWS is a chronic, highly contagious disease, probably caused by a micro-organism, confined to certain tropical countries, and characterized by a peculiar cutaneous eruption which goes through the stages of squamæ, papules, and tubercles; it is accompanied by a variable (but generally slight) amount of constitutional disturbance, and tends to recovery.

SYNONYMS.—Yaws is the common name given to this disease in the British colonies and by the negroes from West Africa. Sauvages, in 1759, suggested *frambæsia* as the scientific name, from the resemblance of the split tubercle to a raspberry (*framboise*); though Rat thinks that the characteristic tubercle is more like the top of a pickled cauliflower than a raspberry. Charlevoix, in 1881, proposed *polypapilloma tropicum*; and later, Nicholls has suggested *granuloma tropicum* as a more correct and scientific designation. And it is to be regretted that one or other of these two names has not found universal acceptance. Different places, too, have furnished different names for this disease, the chief of which are as follows: In the French West Indies it is called *piân*; in Brazil and the Spanish and Portuguese possessions, *tubas*,