

the indications for which these powerful remedies were formerly applied—and it accomplishes it without their depreciating effects. What affords more comfort to a child suffering from pneumonia than a tub bath with good friction in water of 95°, reduced during five to eight minutes to 85° or 80° F.? A few baths of this kind repeated every four to six hours, without fuss or confusion, at the bedside (not in a bath-room), calm the respiration, reduce temperature, promote sleep, slow and strengthen the pulse, and refresh the oppressed nervous system. In the interval between the baths I am in the habit, if the temperature and pulse are high, of wrapping around the upper half of the trunk a compress made of three folds of old linen and wrung out of water at 65° F. and always covered by a wider bandage of one layer of thin flannel (without oiled silk), snugly secured over the compress.

By renewing this compress every hour the good effects of the bath are maintained and their frequent repetition is rendered unnecessary.

In the adult patient the tub bath is not so useful, because it involves more trouble to, and disturbance of, the patient, especially if pleurisy be present. Here the wet compress around the chest, not too firmly wrung out of water at 60° F., usually fills all therapeutic indications. It becomes hot, and when removed the re-application causes a deep inspiration, a betterment of pulse quality, and an increase of urine. The latter is also enhanced by draughts of from four to six ounces of water at 45° F., administered regularly every two hours.

No claim is made that cold water cures the disease. The object of these mild cold procedures is to fortify the patient's resisting powers and thus to aid him in maintaining a successful defence against the disease until its natural limitations are reached. The frequency of application, the temperature of the water, the extent of the saturation of the compress, the duration of the bath, the selection of the procedure, are matters for judgment in each individual case. That we can utilize all these, and thus adapt them to conditions as they arise in each individual case, gives this remedial agent a positive advantage over all others and entitles it to more extensive trial and study than it has received. Large clinical observation is the basis of these views.

The *Douche* is a procedure by which water is driven upon the patient's body from the nozzle of a hose the internal diameter of which varies from one-eighth to one-half inch. The ordinary shower bath and the needle bath are multiform douches. The water is usually supplied from a reservoir placed at a height of from thirty to seventy feet, and giving a pressure, at the nozzle, of from fifteen to thirty-five pounds to the square inch. A douche table has been devised by the author (1894) by which the temperature, duration, and pressure are regulated before the patient receives the water. This apparatus is useful only in institutions. It has been adopted in the United States (St. Elizabeth Hospital in Washington and in many other lunatic asylums. It is adapted only to hospitals treating chronic cases in large numbers.\*

CHRONIC DISEASES.—Chronic diseases furnish such a favorite field for hydrotherapy that no internal disease should be yielded up as hopeless until this mode of treatment has been systematically tried, in connection with all those hygienic agencies which are usually of more avail than medicinal agents, viz., exercise or rest, diet, drink, clothing, climate, etc.

The general abluion, drip sheet, wet pack, and douche are useful if they are employed in a properly graded manner. Beginning with the general abluion and gradually lowering the temperature, and doing the same with the drip sheet, always producing reaction, and then, if need be, going on to the wet pack, we have a variety of modes and measures which afford great latitude in energizing the system, enhancing its vital capacity so as to throw off the materies morbi or re-establish the equilibrium of the circulation and nerve centres. (See above for technique.)

\* See author's treatise mentioned on p. 788.

A case of anæmia, for instance, which has resisted iron, strychnine, malt, digestives, etc., often assumes a different aspect when the neuro-vascular discipline produced by this treatment is secured. The effect of increased oxygenation may be greatly aided by following daily treatment with exercise in the open air. The pallid lips assume a ruddier hue, the languid eye brightens, the step becomes lighter. Appetite and assimilation are improved because of the enhanced hæmotosis and improved circulatory conditions in the gastro-intestinal mucous lining. (For rationale see above.)

*Neurasthenia*.—A type of cases which I see quite often is that trying class of neurasthenics who wander from one doctor's office to another, and sooner or later become the prey of charlatans. These patients present every phase of depreciated vascular and nerve condition; some are the prey of morbid fears and become the despair of family, friends, and physician. If such a case be subjected to a methodical course of hydrotherapy the result will often prove a revelation, provided there be no organic basis for the malady. If mild procedures do not meet the indications, douches adapted with regard to temperature, duration, and pressure to each individual case, play the most important rôle here. These are capable of arousing the dormant neurons, enhancing vascular activity, and improving general and local nutrition. The cortical centres, which are the chief points of failure in these depressed neurasthenics, feel the impulse of a better circulation and nutrition. The morbid ideas and illusions vanish. The hypochondriacal introspection ceases, and the patient slowly but surely regains his neuro-vascular equilibrium. The results of hydrotherapy in such cases are, in my experience, far more enduring than those following other methods of treatment.

*Insomnia* is markedly affected by hydiatric measures. *Rheumatism, Sciatica, Gout, Neuritis*.—Another set of cases which are greatly benefited by hydrotherapy are those unsatisfactory rheumatic, gouty, and lithæmic conditions which are the bane of the doctor's life and which we are often so glad to rid ourselves of by sending them to the hot springs. These may be very satisfactorily treated at home.

My personal experience with hydrotherapy in chronic diseases extends over a period of ten years and embraces a very large number of cases of the most varied pathological conditions. The application of this method of treatment to such varied diseased conditions is rendered possible by its flexible nature, which enables the physician to adapt it, by modifications of temperature, pressure and duration, and numerous technical details, to the most varied pathological manifestations, provided he has mastered the rationale of its mode of action, and provided the carrying out of the details is not left entirely to the judgment of bath-nurses. It would be much better to consult some work on hydrotherapy than trust the latter.

When douches are needed, only institutions under the supervision and direction of a trained physician should be resorted to, for in no other way shall we be likely to avoid the dangers of the empirical application of the procedure, which has so often brought disaster to both and discredit to this remedial agent. *Simon Baruch.*

HYDROXYLAMINE.—This compound base is very unstable and exists only in solution. It is ammonia in which one atom is replaced by the hydroxyl group. The formula is NH<sub>2</sub>OH. *Hydroxylamine hydrochloride* forms in colorless crystals resembling ammonium hydrochloride; it is hygroscopic and very soluble in water, alcohol, and glycerin. It possesses active reducing properties, in consequence of which it has been proposed as a substitute for chrysarobin and other reducing agents in the treatment of skin diseases, such as psoriasis, parasitic affections, and in lupus. The disadvantage attending its use is the toxic symptoms that may arise from absorption. These ill effects are due to its reducing action on the hæmoglobin of the blood. It may also prove very irritating to the skin. For ordinary use, a strength of one part in a thousand should be commenced with and

increased to one in a hundred, if no local irritation is produced. The application may be made twice or three times a day. *Beaumont Small.*

HYÈRES AND COSTEBELLE.—Hyères, situated in the department of the Var, is the most southern of all the winter stations along the French Riviera. It is fifty-five miles southeast of Marseilles and seventy-two and a half miles west of Cannes. Unlike the other Mediterranean resorts, it is three miles from the sea, lying at the foot of a steep hill having an elevation of about seven hundred feet. It is sheltered by the mountains from the north and northeast winds, but exposed to the northwest and west winds; hence it suffers, like the other resorts on the coast, from the disagreeable "Mistral," which is especially frequent in February and March. It is less affected by the sea breezes, not only on account of its distance from the sea, but also on account of the protection afforded by the islands lying off the coast—the Isles d'Hyères.

Costebelle, a suburb of Hyères, consisting of a few houses and several hotels surrounded by pine woods, is almost on the coast, so that patients can easily have the change from the more sedative air of Hyères to the more bracing and stimulating atmosphere of the seaside.

The town of Hyères itself contains 17,700 inhabitants, and consists of the old and the new town, the latter being the resort of invalids and visitors,—a place where there are villas, hotels, fine avenues, and public gardens.

The winter climate is mild, dry, and sunny, but, as has been said, there exists the one great disadvantage of the cold northwest wind (mistral). "Favorable as I believe this station to be," says Cazalis, quoted by Burney Yeo, "up to the time that the mistral begins to blow, equally dangerous do I believe it to be from that moment." "It is a most searching wind," says Cormack ("The French Riviera—Hyères as a Health Resort," *The Climatologist*, January 15th, 1892), "and very trying to invalids and those of a nervous temperament. Patients, as a general rule, are much better at home than out of doors while it lasts."

CLIMATIC DATA OF HYÈRES. (From Biden and Cormack.)

	November.	December.	January.	February.	March.	April.	Mean of six months.
Temperature—							
Average or normal ..	53.6°	48.0°	47.5°	48.5°	51.0°	55.0°	50.7°
Average range .....	15.6	15.0	16.5	15.9	17.5	16.1	
Mean of warmest .....	61.4	55.5	55.8	56.5	59.8	63.3	58.7
Mean of coldest .....	45.8	40.5	39.3	40.6	42.3	47.2	42.6
Highest or max.* .....	63.7	57.5	57.5	57.5	60.0	66.7	
Lowest or min.* .....	45.0	40.5	41.2	41.5	44.2	52.2	
Humidity—							
Average or relative..	76%	73%	76%	75%	71%	71%	73.5%
Precipitation—							
Average in inches ...	3.52	2.86	3.08	2.21	2.26	3.11	17.04
Wind (number of days)							
Light to fresh .....	10	11	9	11	15	16	74
Strong to a gale .....	2	5	3	3	3	4	22
Weather—							
Days of sunshine per month .....	21	21	23	20	25	23	135
Days on which rain fell .....	7	6	6	6	5	7	39
Days calm .....	16	15	18	13	12	9	84

\* At midday and 8 A.M.

In looking over the climatic table of Hyères arranged from data of Drs. Biden and Cormack, it will be observed that the mean average temperature for the months from November to April inclusive, does not vary very much from month to month. Neither do the extremes appear to be very great. The average daily range is large, owing to the rapid fall of the thermometer after sunset, which frequently amounts to as much as seven or eight degrees.

Between the hours of 8 A.M. and 4 P.M., however, says Cormack, the winter temperature may be said to vary between 50° and 59° F. in the shade, and from 75° to 85° F. in the sun. Occasionally the freezing point is

reached. The air is moderately dry, as indicated by the relative humidity, and there are no mists. The rainfall is small, and for the six months rain falls on an average only on 39 days.

There is a very large amount of sunshine, an average of 135 days out of a possible 181 days, or three-fourths. There is an average of 22 days of light winds and 22 of strong ones. If the winds, especially the mistral, could only be eliminated, this resort, as indeed the others of the Riviera, which in like manner suffer, would be most delightful; but the health resort is yet to be discovered in which every climatic factor is favorable. As has been referred to in the article upon *Cannes*, the climate of the Riviera, in the writer's opinion, is far inferior to that of southern California, with which it is comparable, especially in temperature, dryness, the amount of sunshine, and, more than all, in regard to the winds. Southern California is free from high, cold winds like the mistral. In Southern California we have, moreover, that degree of equability which is nowhere found on the Riviera.

In like manner comparing the Riviera with southern Florida, we find that the climate of the latter possesses that measure of warmth and equability which is not found in the former, and is free from cold winds, though on the other hand, Florida is considerably moister than the Riviera. Speaking in general of the winter climatic characteristics of Hyères, we may say that they are mildness, purity of air, abundant sunshine, and moderate dryness. On the other hand, the chief feature of an unfavorable nature is the "fearful" mistral. "It rakes the valley from end to end, with no obstacle to stop it or turn it; it blows sometimes for six or seven days together, and nights too!" (Cazalis, quoted by Burney Yeo.) Although cold, this mistral is a very dry wind, and a wind which generally brings fine, clear weather. The air loses its humidity and becomes dry, cold, penetrating, and irritating. As has been before noted, it is not frequent until February or March.

The invalid's day, as given by Cormack (*op. cit.*), is comprised between the hours of 10 A.M. and 3 P.M. for the warmest months, and between 11 A.M. and 3 P.M. when the days are colder. At sunset there is a rapid fall of temperature which renders it dangerous for delicate persons to go out after that time. There is also a marked difference between the sun and shade temperatures, so that it is always wise to be provided with a wrap. The vegetation is luxuriant and varied. "The mountains and hills are covered with trees as green in the winter as in the summer." The orange, olive, and palm trees are seen on every hand. Roses, violets, anemones, hyacinths, etc., are sent in great quantities during the winter to the European markets, and early fruit and vegetables are cultivated for the Paris market. There are many charming and picturesque promenades, and in this respect, says Burney Yeo, Hyères is much better off than most other resorts on the Riviera. The outdoor diversions are many and varied; botanizing, butterfly catching, antiquarian research, boating, fishing, golf, tennis, etc., are some of them. The valley in which Costebelle is situated is better sheltered from the mistral, and is "embosomed in pine woods, broken here and there by vineyards and olive orchards. . . . Near the shore there are large groves of olive trees, which are finer than at Hyères itself, and indicate a warmer climate" (Sparks, "The Riviera"). The water supply of Hyères is said to be good and the sanitary condition satisfactory, except in the old portions of the town. The accommodations are good and abundant.

As to the class of invalids for which the climate of Hyères is beneficial, the testimony is conflicting. Cormack says it is "admirably suited for cases of phthisis," while Drs. Sparks, Weber, and Yeo, says Richards, are rather non-committal. In the writer's opinion, the value of this climate for phthisis is very slight, and while there are so many other resorts of approved value for this disease, he would never think of sending a phthisis patient there, for the reason that the cure cannot be a continuous one on account of the heat in summer, and, secondly, on account of the winds, especially the mistral.



Of other diseases said to receive benefit here, there are mentioned various bronchial affections, liver complaints, Bright's disease, diabetes, asthma, heart disease, rheumatism, gout, and the feeble condition of delicate children. This resort is also suitable for that large class of the feeble from age or other cause who sustain life with less effort in any mild, sunny climate like this; and, finally, for that class who temporarily are worn out with all the demands of city life, who desire a change, *per se*, and who prefer a place where they can lead a simple life out of doors under sunny skies and in pure air, and devote themselves to rest, and freedom from exacting business or social duties. *Edvard O. Otis.*

**HYGROMA.**—The term "hygroma" has been applied to a variety of conditions involving cyst-like spaces filled with fluid. Thus, widely different processes have been classified under the same head. It seems desirable to abandon the use of the word and to apply to the various conditions names more suggestive of their pathology. An increase in the amount of fluid in a tendon sheath leads to the formation of a cyst sometimes called hygroma. The term has been applied also to synovial bursæ distended with fluid.

*Hygroma Congenitum Colli.*—This term has been applied to a form of lymphangioma of the neck. The admirable description by König ("Lehrbuch d. speciellen Chirurgie," i., 528, 1893) has been largely drawn upon in the following account.

The tumor is present at birth. The surface is irregular and the tumor itself is lobulated. The lobules sometimes fluctuate, and at other times are very tense. The location is almost always in the submaxillary region. It may grow very rapidly and become very large. In this case it involves the entire anterior surface of the neck, extends to the face, and hangs over the clavicle and sternum upon the thoracic wall. Cystic lymphangiomas may also occur over the clavicle and on the dorsal surface of the neck. The ventral tumors may penetrate toward the pharynx, larynx, and œsophagus, and disturb the functions of these organs. The skin over the tumors is usually thin and may be even translucent. The growth is very prominent, and the portions lying directly over the great vessels may pulsate.

The functional disturbances in many cases are not marked; in others pressure upon the organs of the neck leads to dysphagia and dyspnoea and congestion of the vessels of the head. The patients may succumb to these symptoms, but this is not the rule. The prognosis is unfavorable, as the majority of the cases soon become cachectic and die. Operation usually hastens the fatal result.

The tumors occupy the subcutaneous and deep connective tissues, extending close to the vertebral column. They displace and may infiltrate organs, as do the malignant tumors. They are multilocular and consist of relatively thin connective-tissue walls which may be lined by endothelium. They are filled with a clear or yellowish liquid, which as a result of hemorrhage may become thick and chocolate-colored. The larger cysts are usually superficial; the smaller ones lie more deeply in the tissues, even at the base of the skull, in the mediastinum, and about the trachea and œsophagus.

In the tumors there occur spaces in the connective tissue of various forms which are not separated from the connective tissue by any special membrane. The larger spaces are rounded in form, or are divided into pockets by septa springing from the wall. They communicate with each other by larger or smaller openings.

It is probable that the spaces arise secondarily, because the smaller they are the more clearly defined are the communications. The smallest spaces consist of a system of vessels constricted at irregular intervals, or of a cavernous tissue whose lumina present an anastomosing system of channels. In either case the condition is continuous with a system of small anastomosing vessels, whose lumina are cylindrical or cleft-like, and have the

characteristic distribution of lymph vessels. The spaces and channels are lined by endothelium.

The cystic spaces, then, consist of enlarged and distended lymph vessels. According to König this view is supported by Köster, von Winiwarter, Wegner, and others. It was formerly held by Rokitansky, Virchow, and Arnold that they originate from the connective tissue.

Perhaps most of the forms observed in adults originate in the same way. In these rare cases the tumor usually contains only a few cyst-like spaces and occurs near the trachea or in the region of the clavicle. It is possible that some of them originate from aberrant thyroids.

It seems desirable to abandon the name "hygroma" for this condition, and to use instead, "lymphangioma," a term more suggestive of its pathology.

*H. S. Steensland.*

**HYGROPHILA.**—The herb, also the seeds, of *H. spinosa* T. And. (fam. *Acanthaceæ*), an annual or biennial plant of India, very largely used medicinally by the natives. The herb contains a crystallizable body which is probably alkaloidal; the seeds; considerable gum; and much fixed oil, with indications of an alkaloid (*Hooper*). The drug acts as a diuretic and has been sparingly used as such in British practice. It has also been marketed as an adulterant of chiretta. *Henry H. Rusby.*

**HYOID BONE, FRACTURES AND DISLOCATIONS OF.**—Of the few cases on record of fracture of the hyoid bone, three were produced by hanging; three by the throat having been seized between the thumb and fingers; three by direct blows or falls upon the front of the neck; and one by muscular action alone.

In those cases in which the injury was produced by hanging, the body of the bone was broken. In all of the other examples the fracture involved one of the great cornua, or occurred at the junction of the cornua with the body. Crepitus is generally absent. In two of the recorded instances the adjacent mucous membrane of the pharynx was ruptured.

The symptoms observed have been a sudden sensation as if a bone had been broken; in a few instances a profuse bleeding from the fauces; difficulty in opening the mouth; in some cases dysphagia and aphonia; pain in movements of the tongue, with, usually, more or less swelling about the neck, and ecchymosis; later, cough, expectoration, and hoarseness. The circumstances which indicate with certainty the nature of the accident are unnatural mobility of the fragments, with or without crepitus, and an angular inward projection, which may generally be felt in a careful examination of the pharynx. The accident can be regarded as dangerous only in view of its complications. Of three cases in which it resulted from a direct blow only one survived, while of three resulting from lateral pressure upon the cornua all recovered.

The amount of difficulty in replacing the fragments of the bone will depend largely upon the extent of displacement and the consequent laceration of the neighboring tissues. An attempt should be made to accomplish replacement by introducing one finger into the mouth, while, with the opposite hand, the fragments are supported from without. From the nature of the parts, any attempt at the application of a splint or support will be useless.

Rest to the parts, together with general measures to allay inflammation, will generally constitute the available treatment.

Luxation of the hyoid bone is a very rare accident. The principal symptoms noted have been pain at the seat of injury and difficulty in swallowing. In a case observed by Daly (*Archives of Laryngology*, vol. i., p. 162) luxation of the left cornu had been of frequent occurrence, caused usually by laughing or yawning. A laryngoscopic examination showed no internal lesion. Reduction was effected by grasping the throat firmly

with the thumb and index finger of one hand, steadying the head with the other hand, and then directing the patient to swallow vigorously, while at the same moment the parts were compressed between the thumb and finger, and then quickly released again. After the third effort the patient suddenly declared that he was relieved, and, in proof of this, he moved his head rapidly in all directions with ease and comfort, and drank successfully a glass of water. *D. Bryson Delavan.*

**HYOSCINE, SCOPOLAMINE.**—(C<sub>17</sub>H<sub>21</sub>NO<sub>4</sub>) An alkaloid obtained from henbane and scopolia, and existing in other *Solanaceæ*. It occurs as a thick, colorless syrup, soluble in alcohol, only slightly in water, but all its salts form in large, white, prismatic crystals, freely soluble in water, insoluble in alcohol and ether. The salts also resemble each other in therapeutic as well as physical properties. The hydrobromate, hydrochlorate, sulphate, and hydriodate are prepared, and the first-named is official.

As a mydriatic, it is rapid, energetic, and brief, but its action is readily maintained. During the administration of the drug its effect on the pupil is an early symptom. Dilatation is said to be more marked with a one-fourth to one-half-per-cent. solution than with a one-per-cent. solution of atropine; it has to be used with caution on account of the readiness with which the system is affected. In this direction, therefore, it is to be classed with atropine. For its effects upon the peripheral nervous system, and upon the secretions, the action of atropine may also be consulted. Centrally, however, its action is very different. The stimulant action so characteristic of atropine is here present, if at all, only as a very brief primary stage, and is followed by sedation, or depression, which constitutes the characteristic action of the drug. In very sensitive subjects the period of excitement may be prolonged, but usually it constitutes the slightest preliminary stage, and is followed by drowsiness, and if the dose be full, by a natural sleep. The spinal centres are similarly depressed, especially the reflexes. Depression of the sensory centres is very mild and does not materially affect painful conditions. Circulation and respiration are both reduced, though the pulse rate is increased.

Its toxic action is shown by the dilated pupil, rapid pulse, relaxed arteries and redness of the surface, dry, hot skin, rapid breathing, and coma and convulsions. Therapeutically, hyoscine has come into prominence as a sedative and hypnotic. It has largely supplanted morphine in the treatment of acute mania and delirium tremens, in restlessness, in the violent manifestations observed in all forms of mental disorders, and in hysteria and epilepsy. Its sedative action is very rapidly produced, and in the majority of cases a calm and refreshing sleep ensues. From this sleep the subject can be readily and completely roused. When pain is the cause of insomnia, the remedy is not of much service. Its action is purely calmative and sedative on the brain, and it should not be administered as a powerful or decided hypnotic. In insomnia it is applicable only in cases in which this arises from central or nervous excitement. In mania, and when there is much excitement, it should be given in full doses of gr.  $\frac{1}{16}$  by the mouth, or gr.  $\frac{1}{16}$  to  $\frac{1}{8}$  hypodermically; a small dose is generally sufficient. When the symptoms are less acute, smaller doses should be given.

Hyoscine has also proved itself very efficient in the treatment of chronic mania and all nervous affections accompanied by mental restlessness; also in nervous diseases characterized by debility and tremors, as in paralysis agitans, disseminated sclerosis, and chronic alcoholism. In these cases the stimulating action of small doses is taken advantage of, and gr.  $\frac{1}{16}$  daily or twice a day is a sufficient dose. Its antispasmodic action is also secured with the same small dose, and it may be used, and with benefit, in chorea, asthma, and other spasmodic troubles of a nervous origin. The system readily becomes accustomed to it, and calls for increasing doses. When cardiac disease is present the use of hyoscine should be avoided or it should be given with great caution, on account of its depressing action on the heart and circulation.

The early physiological effects of the drug are manifested far in advance of dangerous symptoms, but in some cases very severe toxic symptoms have been produced by doses of gr.  $\frac{3}{16}$  and  $\frac{1}{4}$ . Pilocarpine and morphine are physiological antidotes. The former has proved very serviceable and may be administered freely, as much as two grains having been required in a case of delirium tremens in which a comatose condition followed frequent doses of hyoscine. *Henry H. Rusby.*

**HYOSCYAMINE, HYOSCYAMINA.**—(C<sub>17</sub>H<sub>23</sub>NO<sub>3</sub>) An alkaloid obtained from henbane and also existing in other species of *Hyoscyamus*, and in belladonna, stramonium, and other *Solanaceæ*. Professor Ladenburg demonstrated that atropine, daturine, and duboisine are identical with hyoscyamine, both in chemical constitution and in physiological action. Any difference is to be found in the molecular arrangement of the constituents, and not in any fundamental change. The terms "atropine" and "hyoscyamine" have been applied to the heavy and light mydriatic alkaloids obtained from the belladonna and henbane plants, the former being the heavy and the latter the light alkaloid. It is now known that both the heavy and the light alkaloids may be obtained from either plant, according to the process of manufacture. The light may be converted into the heavy by melting under reduced pressure, by the addition of caustic soda to its alcoholic solution, and in other ways.

Hyoscyamine occurs in light, silky, snow-white crystals, without odor, soluble in one hundred and twenty parts of water, freely soluble in alcohol, and in acidulated water. There is also an uncrystallized or amorphous hyoscyamine, of a dark-brown extract-like mass, with a strong disagreeable odor. This appears to be a mixture of the various alkaloids and extractive matters. A sulphate, hydrochlorate, hydrobromate, and hydriodate of hyoscyamine are prepared, the first and third of which are official; they are alike in degree of strength and character, forming white, fine crystals very soluble in water. A sulphate and hydrobromate prepared from the amorphous alkaloid are amorphous, deliquescent salts, and less active and certain in their effects.

The therapeutic properties of hyoscyamine are very uncertain. At times it exactly resembles atropine, at others quite closely hyoscine. The cause of this variation is not determined, but it appears probable that it is due to the presence respectively of atropine and hyoscine in the commercial article, as such is the effect when these impurities are known to exist. The degree of activity is equally variable. It is normally weaker than both atropine and hyoscine, and is often so weak as to require doses which would be dangerous in the case of either of those alkaloids. On the other hand, alarmingly poisonous symptoms sometimes follow the ordinary dosage, which is larger than that of the others. The presence of the amorphous salts in the market is the source of much of the uncertainty of its action, and the cause of many of the toxic symptoms. The dose of these salts is usually much larger, being from gr.  $\frac{1}{4}$  to i., but they should never be employed. Even the "pure" alkaloid of Merck is given in one-quarter-grain doses, while his "chemically pure" alkaloid must not be given in excess of gr.  $\frac{1}{10}$ .

The mydriatic action of hyoscyamine is rapid and powerful, but not so manageable as that of atropine. Cases are reported in which it produced spasms of the ciliary muscle and intense pain and distress; the solution used was gr.  $\frac{1}{4}$  to the drachm, and relief was obtained by placing in the eye a stronger solution of the same alkaloid. The toxic effects produced are the same as those of hyoscine, viz., dryness of the throat and mouth, and of the skin, accelerated pulse, dilated vessels, and excitement followed by convulsions and coma.

This alkaloid is employed as an hypnotic, nerve sedative, and antispasmodic, in mania, restlessness, delirium, insomnia, and all conditions accompanied by mental excitement; also in asthma, chorea, epilepsy, etc.

*Henry H. Rusby.*



HYOSCYAMUS. See *Henbane*.

**HYPERIDROSIS** is a functional disorder of the sweat apparatus accompanied by a more or less excessive increase of the normal amount of sweat excreted. This increase may be local or general. Local forms are symmetrically confined to certain regions such as the palms of the hands, soles of the feet, axilla, or genital regions. Cases of unilateral excessive sweating, confined to one side of the body wholly, have been observed, but they are rare; of more frequent occurrence, although still not common, are the cases of unilateral sweating limited to one side of the head or to one limb. Usually intermittent, the sweating in some cases may be continuous and is aggravated by hot weather, emotion, depression of general health, etc.; and the disturbance may be temporary or permanent, depending upon its exciting cause. Subjects of the disorder are nearly always in a lowered state of health, sometimes hysterical and often nervous. The direct causes which lead to local hyperidrosis are quite undetermined. Examinations of sections from the palms of the hand fail to show any abnormal features of either the glands or the epithelium. The disorder is to be regarded as purely functional, connected with a disturbance of the vaso-motor control, no doubt, but as yet the exact links of the chain have not been definitely placed.

In the *treatment* of hyperidrosis, whether local or general, the condition of the patient's general health is of prime importance; the various ferruginous tonics, mineral acids, arsenic, strychnine, and quinine, are all of value. Belladonna and atropine, though but of temporary benefit, are of service at the outset of treatment in most cases. Cold baths for general toning of the circulation are strongly recommended. External treatment must be resorted to and is often very efficacious. In the local form that attacks the hands much benefit will be derived from immersing the palms for a few moments only in water as hot as can be borne, dabbing dry with a soft cloth, and then dusting on boric acid powder. The same treatment for the soles of the feet may be employed. A saturated alcoholic solution of boric acid dabbed on the palms during the day will control very well the excessive sweating of the hands that is so annoying to those who do much writing. Hebra's treatment for hyperidrosis of the feet consists of enveloping the feet, the toes separately, after thorough washing and drying, in strips of cotton cloth, over which is spread, to the thickness of a knife blade, his Unguentum diachyli. The parts are well bandaged and the patient may subsequently either remain at rest or pursue his vocation, wearing shoes and stockings that have not been previously used. In twenty-four hours the feet are redressed without washing, after dry rubbing and a dusting powder. This process is repeated daily for from ten to twenty days, after which a dusting powder, preferably boric acid, may be substituted for the local dressing. There occurs a parchment-like desquamation of the skin in thick, yellowish-brown flakes, beneath which is formed a new and at first tender, but apparently normal, epidermis. When the latter has lost its tenderness, the feet are for the first time washed with water. The process is to be repeated in case of failure.

*Prognosis* in any case of hyperidrosis is uncertain. At times treatment may meet with brilliant success; again, it is followed by complete failure. The disorder may disappear spontaneously, only to recur and prove obstinate to all measures. *Charles Townshend Dade.*

**HYPERMETROPIA—H**—(from *ὑπερμετρος*, overmeasure, and *ὄψις*, eye—less correctly *hyperopia*; *Ubersichtigkeit*, Ructe, 1853; incorrectly *hyperpresbyopia*, Stellwag, 1855) is the name given by Donders (1860) to the abnormal refractive condition of the eye in which its principal focus—i.e., its focus for parallel or practically parallel rays, such as are received from a distant object—lies at some point beyond the actual position of the retina. In H the antero-posterior axis of the eyeball is too short relatively to the focal length of the eye as determined by the radii of curvature of its three refracting surfaces,

namely, the anterior surface of the cornea and the anterior and posterior surfaces of the crystalline lens, and in typical H the axis is actually shorter than in the normal or emmetropic eye. H is ordinarily an inherited condition, and may then be regarded as a result of incomplete development of the great posterior segment of the eyeball, in consequence of which the axis remains shorter than in the normal eye.\*

The essential points of difference between the emmetropic and the hypermetropic eye are shown in Fig. 2758, in which the dotted outline represents in section the normal or emmetropic eye, and the continuous out-

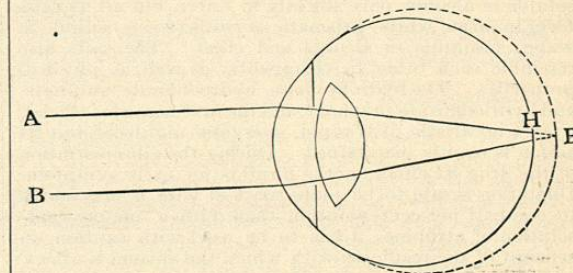


FIG. 2758.

line a hypermetropic eye. It is a property of the emmetropic eye, when in a state of accommodative rest (see *Accommodation and Refraction*), that the sum of the refractions at the surface of the cornea and at the two surfaces of the crystalline lens is just sufficient to unite all the rays of a parallel pencil, *A, E, B*, in a focus upon the retina at *E*. When the retina is so misplaced as to lie within the principal focus of the dioptric media, the pencil is cut by the retina before its rays have come together, and the image of a distant point upon which the eye is directed is formed at *H* as a circular spot of appreciable diameter (circle of confusion). What is true of a pencil of rays emanating from one point of the distant object is true of pencils emanating from other points of the same object; the inverted retinal image is, therefore, more or less confused, and all the finer details of the object are lost. This confusion of distant vision is experienced by every hypermetrope whenever his accommodation is fully relaxed, and it may be evoked artificially, in any case of H, by paralyzing the accommodation by instilling a drop or two of a mydriatic solution, such as atropine, into the conjunctival sac.

As the emmetropic eye, when in a state of complete accommodative relaxation, is adjusted for the focussing of parallel rays upon its retina, so the hypermetropic eye is adapted for the focussing of rays of some definite degree of convergence. Fig. 2759 shows a convergent pen-

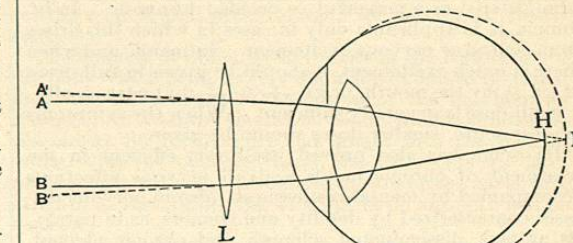


FIG. 2759.

cil, *A', H, B'*, focussed upon the retina of the hypermetropic eye at *H*, and also a pencil, *A, H, B*, of rays originally parallel, but rendered convergent by passing

\* H is, in fact, the normal condition in the *Quadrumana*, and in the higher *Mammalia* generally.

through a convex lens, *L*. The hypermetropic eye receiving and focussing such a convergent pencil becomes practically equivalent to an emmetropic eye receiving and focussing a pencil of parallel rays, and as any required degree of convergence may be given to an origi-

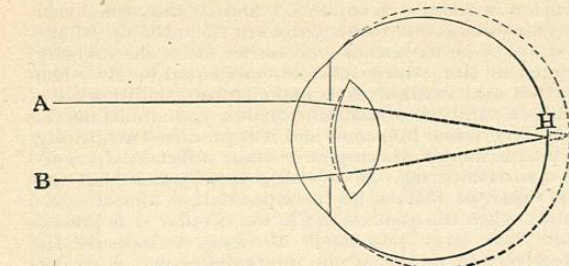


FIG. 2760.

nally parallel pencil by allowing it to traverse a convex lens of suitable power, so the vision of a hypermetrope may always be perfectly corrected for distance by wearing properly chosen (neutralizing) convex glasses.

H does not ordinarily give rise to defective vision at a distance so long as the range of accommodation (*A*) remains unimpaired, as in the case of young persons. The reason of this will appear from an inspection of Fig. 2760, which shows a hypermetropic eye adjusted for the focussing of a pencil of parallel rays, *A, H, B*, through the increase in the convexity of its crystalline lens incident to the act of accommodation. The focussing of the several pencils of rays which form the retinal image is here as perfect as in the case shown in Fig. 2759, but with the difference that some part of the accommodation is expended in advancing the focus from its normal position at *E* to the actual position of the retina at *H*, so that only the unexpended part is available for the further adjustment of the eye to meet the requirements of near vision.

Fig. 2761 shows a hypermetropic eye, in its condition of fullest accommodative adjustment, focussing a divergent pencil, *A, H, B*, emanating from an object situated at its nearest point of distinct vision. Fig. 2762 similarly shows an emmetropic eye focussing a more divergent pencil, *A, E, B*, emanating from a nearer object situ-

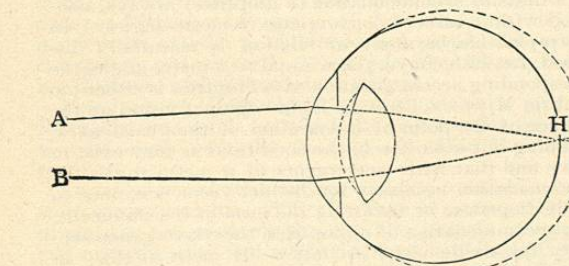


FIG. 2761.

ated at its nearest point of distinct vision. Comparing these two figures, it will be seen that the near-point of distinct vision for the hypermetropic eye lies farther from the eye than the near-point of distinct vision for the emmetropic eye, so that the hypermetropic eye, as compared with the emmetropic eye, is limited in its region of adjustment for near vision (region of accommodation), and the higher the grade of H the greater the limitation.

In very high grades of H the absolute range of accommodation (*A*) may be insufficient, even in young persons, for the perfect focussing of parallel rays upon the retina, in which case H is said to be absolute (*H absoluta*). This condition is shown in Fig. 2763, in which the focus of the parallel pencil, *A, H, B*, which, without aid from the accommodation, would lie at *E*, is, through the full

exercise of the accommodation, advanced to *H*, which, however, still lies behind the actual position of the retina at *Ha*. A point in the distant object, which in the emmetropic eye would be depicted as a point at *E*, is, therefore, actually depicted as a circular spot (circle of confusion) at *Ha*. Even under the full exercise of the accommodation this circle of confusion still remains a spot of appreciable diameter; the retinal image of the distant object is therefore made up of circles of confusion instead of points, and, although it may be improved in definition through the exercise of the accommodation, the picture remains confused in its details.

This distinction, in young persons, between *H absoluta* ( $H > A$ ) and the lesser grades of H ( $H < A$ ) is important. In  $H < A$  the hypermetrope is able to see at a distance by using only a part of his accommodation, and he has still a residual accommodative power sufficient to meet, in some measure, the requirements of near vision. He therefore forms the habit of using some part of his accommodation in every act of vision, and by a strong exercise of the same faculty he may even be able to read, although necessarily at the cost of excessive effort, and generally for a limited time only. Hence a hypermetropic child is apt to be judged harshly by parents or teachers, who, recognizing the fact that he is able to apply himself effectively to his books for a short time, are slow

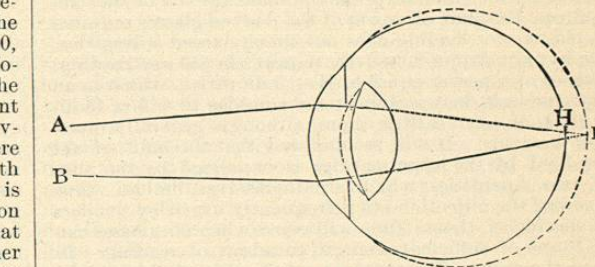


FIG. 2762.

to comprehend that he becomes quickly wearied and is incapable of sustained application (see *Asthenopia*). In certain cases, however, impelled by the strong desire to see distinctly, the child learns to force his accommodation by concentrating an abnormally powerful impulse upon the two correlated functions of accommodation and convergence, and thus acquires the power of sustained application by sacrificing binocular vision and laying the foundation of a convergent squint. (See *Asthenopia* and *Strabismus*, also later in this article.) In  $H > A$  (*H absoluta*), on the other hand, distinct vision is impossible even at a distance, and, although the definition of objects may be considerably improved by a strong

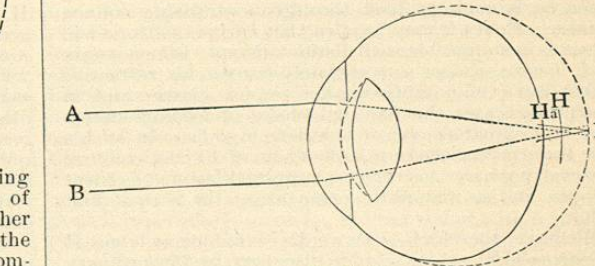


FIG. 2763.

accommodative effort, it nevertheless falls so far short of perfect vision as not to offer a sufficient motive for continuous or prolonged exertion. In *H absoluta*, therefore, the case is apt to be regarded as one of defective vision, and glasses are perhaps tried at random until a pair of convex spectacles is found, which renders the use of the eyes comparatively easy. But even here prejudice may come in to deter a parent from permitting the child to