square sticks, nearly a foot long. The latter form is that generally used in bacteriological work. It is less transparent than either of the others, and is not so white.

Agar-agar consists almost wholly of gelose, a substance the solution of which cools to a jelly, which is much more stable than that of gelatin, requiring a higher temperature for melting. It is said that a solution of 1:500 of water will yield a stiff jelly. Gelose is precipitated by alcohol, but not by tannin.

Gelasine is merely a variety of agar-agar.

Agar-agar has no medicinal properties, its uses being wholly nutritive and mechanical.

H. H. Rusby.

AGARIC, PURGING.—(*White agaric; Touchwood, Spunk, Tinder.*) The decorticated hymenium of *Polyporus officinalis* Fries (*Boletus Laricis* Linn.); order, *Basidiomycetes, Hymenomycetes;* a large fungus growing upon the stems of the European larch and of one or two other conifers. It forms large hoof-shaped masses upon the sides of the trunks, and penetrates with its mycelium deep into the wood. When young they are soft and juicy, but when fully grown hard, and of a consistence between spongy and corky. The masses are collected in Europe, Asia Minor, etc., and usually prepared by drying and peeling. Agaric is in yellowish-white, friable, light, and spongy irregular balls and lumps, from the size of an orange to that of a cocoanut and larger. It has evidently been peeled, and the surface is finely rough and dusty with minute separated particles. The texture is rather firm, but soft; it can easily be reduced to a coarsish powder by friction or by rubbing on a sieve, but is difficult to pulverize finely; its microscopic structure—a tissue made up of interlacing, thread-like cells—explains its peculiar consistence.

Agaric has a heavy fungous odor, and a slowly developing, bitter, nauseous taste, which is at first sweetish. Its powder is very irritating to the eyes and nose, and produces violent sneezing. As it is also light and dusty, persons employed in beating it in mortars are obliged to resort to devices to prevent its rising.

It contains nearly one-third of its weight of resinous matters, extractible by strong alcohol, and these can be separated further into three or four simple resins. The active principle is *agaric* or *agaricic acid.* Commercial *agaricin* is a concentrated extract of agaric, and constitutes an impure and indefinite form of agaricic acid.

Agaric, as its name indicates, was originally used chiefly as a cathartic, but such use is rare at present. It is now rather considered that purgation is indicative of over-dosing. It is, in fact, but little employed in its own form, while agaricin and agaricic acid are growing in favor as remedies for the control of sweating, especially in phthisis. The dose of agaric is 0.02 to 0.06 gm. (gr. iij. to x.). More than this acts as a purgative. (See also *Agaricic Acid.*)

H. H. Rusby.

AGARICIC (or AGARICINIC) ACID.—($C_{16}H_{30}O_5+H_2O$.) The active constituent of agaricin. It occurs as a white, almost tasteless powder, soluble in alcohol and with some difficulty in water, and may be given in doses of .02–.03 gm. (gr. ⅓ to ½), for the same purposes as those for which agaricin is used. (See *Agaric.*)

H. H. R.

AGATHIN.—Cosmin-salicyl-alpha-methyl-phenyl-hydrazone, $C_6H_3CH_3N_2.CH.CH_4OH$. This compound results from the reaction between the basic alphamethylphenylhydrazin and salicylic aldehyde. It occurs in colorless crystals, or in greenish-white crystalline flakes; is odorless, tasteless, insoluble in water, and soluble in alcohol and ether. It was introduced by Roos as a remedy for rheumatism, and it has been found effective in this disease and in neuralgia. It has been known at times to produce headache, but not any of the other symptoms of salicylism. This is one of the rheumatism remedies which do not depress the heart. Dose: gr. iij. to x. from three to six times a day.

W. A. Bastedo.

AGE.—The age of a human being does not, as usually reckoned, correspond to the length of time it has existed, because the ordinary calculation starts from the date of birth, and excludes the preceding period of uterine existence. If we are to be strictly accurate, the age of any animal ought to be reckoned from the time of impregnation, especially if we are to compare different species one with another, in regard to the changes which correspond to successive ages. The act of impregnation creates a new individual, which alters as time elapses, and the liberation from the womb is only one of the alterations, one event, occurring in the life history of the individual; it is therefore artificial arbitrarily to select the date of delivery as the zero point from which to start the reckoning of the age, the more so as we know that the period of gestation varies very considerably in length, and that consequently the age of the child at birth is not by any means uniform. In the case of man it is the most convenient plan to adopt popular custom, because the ages as reckoned from birth are generally known with exactitude, but the age of the fœtus at birth is almost never known for a given individual. Indeed, we have at present no means of determining satisfactorily the age of a human embryo or fœtus, because we have no sufficient available data for ascertaining when impregnation takes place. As is shown in the articles *Fœtus* and *Impregnation*, there is always a possible error of several days in any estimate of the age of a fœtus, even when the history of the case is fully and accurately known, and there are decided reasons for thinking that there may be sometimes an error of a month or whole menstrual period. Obviously it is not practicable to calculate the age of man from an event the time of which we cannot know correctly, and it is the only practicable course for us to follow custom, and assume the commencement of life's journey to be some way along the route, namely, at birth; at least, whenever we have occasion to measure age.

From impregnation to death, at the natural term of life, the organism undergoes a definite series of changes which are termed the phenomena of senescence; in plain words, the organism grows old. The most important, if, indeed, not all the changes, may be grouped under three heads: First, the increase in the number of cells; second, the weight of the cells; and third, the differentiation of the tissues. The first and second are the essential factors of growth, and under *Growth* they are more fully discussed. Unfortunately, we have no knowledge as to the number of cells in the body at different ages, nor is it possible to make even a valid estimate. It appears entirely practicable for some patient investigator to make an approximate determination of the number of cells in the body; a trustworthy result would be extremely valuable. But though we cannot speak of actual numbers, we are able to say that the rate of multiplication of cells diminishes gradually with one or two possible interruptions in man. The demonstration of this law is given in the article on *Growth.* As regards the size of the cells, we know that at first the size is reduced; during the segmentation of the ovum, the amount of material remains nearly constant, while the segments (cells) multiply; hence they necessarily become smaller. During fœtal life they remain small, even after their differentiation into distinct tissues, but it is still uncertain how much of the growth of children is due to the mere increase in size of the histological elements and how much to the increase in their number. The difference between the fœtal and adult cells is readily seen; unfortunately, it is impossible to give a table of comparative measurements, for the micrometric data, even of the best authorities, are, with very rare exceptions, utterly worthless, from their extreme inaccuracy. The structure of the tissues varies according to the age; for each age there is a characteristic phase of development of the histological

elements, both in structure and arrangement; hence the general anatomy and, therefore, also the functions alter in correspondence with the age. Thus, in a philosophical view of the career of any organism, we are compelled to regard it as a function of the time elapsed since the procreation of the individual. It is important to insist upon this conception, because the student of human anatomy derives his notions almost exclusively from the study of the adult, and consequently fails to seize the idea that much of what he conceives to be essential and typical is only temporary.

There is another general consideration to be urged upon the attention of the reader: the older the organism the longer it requires to change. An infant alters more rapidly than a child, an adult more rapidly than an old person. This fact has a more profound significance than at first appears, because it not only suggests the only theory of the origin and nature of natural death having any serious value, but also is the clew to the distribution of variations in age. For the theory of death, see the concluding portion of the article on *Growth.* The law of variations to which we refer demands brief elucidation. Varieties occur in all degrees: with living organisms there is in each case a certain variety which occurs most frequently, and on either side of this most frequent type (geometrical mean) occur other varieties which are found to be less frequent the more they depart from the central type. On the doctrine of chances the distribution should be alike above and below the mean, provided always there is no predominating factor or factors of variation to disturb the symmetry. In the development of living organisms there is such a disturbance through the effects of age; a concrete example shows the phenomenon plainly. The following table, after Heinricius,* gives the ages and number of persons observed in 3,500 recorded cases of first menstruation in Finland. Below the table is given the graphic representation of the same data.

TABLE OF 3,500 CASES OF FIRST MENSTRUATION (observed by HEINRICIUS in Finland).

Ages (years)	11	12	13	14	15	16	17	18	19	20	21	22	23	25	26
No. of Cases	9	33	135	440	765	846	560	347	198	102	41	12	7	4	1

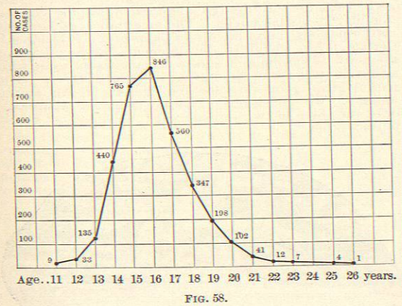

FIG. 58.

The curve shows that the year in which the first menstruation occurs most frequently is the sixteenth, and the further we follow the curve from the maximum, either forward or back, the lower it sinks. Moreover, from the maximum to the minimum is (probably) only seven years on the young side, but ten years on the old side. Here, then, we see that an equal range of variation covers a much shorter period of childhood than of later life. When a larger series of statistics are compiled, the difference in the premaximal and the postmaximal period is found to be considerably greater. This phenomenon occurs not only with menstruation, but with many, and probably all, or nearly all, phases of the development of the body; the time at which a given change takes place varies in different individuals, and, as far as at present known, always according to the law just indicated. In the article on *Growth* another set of facts are brought forward, demonstrating the same principle, which we may now formulate as follows: *The time required to accomplish a change of a given extent increases with the age of the organism.*

It is evident that this generalization needs to be tested with great thoroughness, especially to ascertain whether it is rigidly applicable in details, or only in regard to the whole course of development broadly considered. As no researches have heretofore been made to settle the alternative stated, it is very desirable that they should be undertaken. It may be discovered that diseases and recovery from diseases vary in rapidity in accordance with age, the rate of change decreasing with the age. This can be decided only by extensive statistics in regard to organic diseases. A large number of observations of the progress of fatal new formations—of cancer, for example—would be of high value. It is not to be anticipated that the diseases of a parasitic or zymotic character would exhibit necessarily any such correlation with age, because their course is dependent primarily on other causes than the condition of the organism in which they appear. If the rate of disease does vary with age, the desirability of knowing the fact is too obvious to require further emphasis; we can, therefore, only express the hope that some one having a proper opportunity will soon make an adequate investigation.

It is a common custom to divide the period of life into a succession of ages, but all such divisions are more or less arbitrary; and though extremely convenient, are quite without scientific significance. The ages commonly adopted are: (1) *Infancy*, from birth to the appearance of the temporary teeth; (2) *childhood*, from the cutting of the first permanent teeth to puberty; (3) *youth*, from puberty to the attainment of the full stature, that is, eighteen or nineteen for girls, twenty-one to twenty-two for boys; (4) *maturity*, covers the interval from youth to the climacteric, after which follows (5) the period of decline or *old age.* Another very common distinction is made between the period of development, say up to twenty-five or thirty years, and the period of decline; but, as is explained under *Growth*, there is a steady decline going on during the first period also. It would, perhaps, be more scientific to designate the earlier phase as the period of histogenesis, during which the tissues are being evolved, and the latter as the period of histolysis, in which the tissues are breaking down—degenerating. But, after all, though a great deal has been written and said, very seriously too, upon the division of life into ages, the discussions have never, and can never, lead to much result beyond fixing upon a set of arbitrary terms, which will always be convenient, provided they are left sufficiently vague.

The other matters which might be put under Age are to be found elsewhere, such as the determination of the age of a skeleton, the age at which the teeth are cut, etc For the characteristics of infancy and childhood, anatomical and physiological, see the articles on these topics. For the changes in old age, see *Senility.*

Charles Sedgwick Minot.

AGENESIA, AGENESIS.—(German, *Agenesie;* French, *Agénésie.*) Without generation; without formation; without parents; unborn; undeveloped; possessing no sex. From the latter meaning arose the conception of sterility or impotence, and the early use of the term in medicine was restricted to this meaning. Later, the idea of lack of sexual appetite became included in this, and the word was used by French writers especially with the meaning of anaphrodisia rather than with that of impo-

* Centralblatt für Gynäkologie, 1883, vii., 72 to 73.

tence. The word has now entirely lost its early significance and has acquired the technical meaning of *total failure of development*.

A partial or imperfect development of parts whose embryonic foundations have been laid is not to be included in the significance of this term, but should be expressed by the words *aplasia, hypoplasia*.

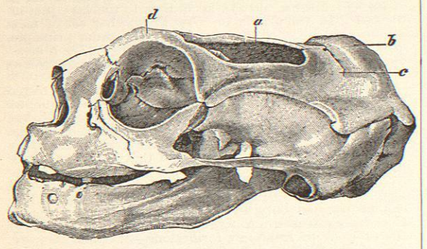

FIG. 59.—Partial Agenesia of the Bones of the Cranium in Anencephalia. *a*, Defect; *b*, occipital portion of skull; *c*, parietal bone; *d*, frontal bone. (Reduced one-fifth.) (Ziegler.)

There is, nevertheless, much diversity of use among writers as to the exact significance given to each one of these terms. Aplasia in its original sense means a failure of restoration or rebuilding, but is now used with two meanings: that of a numerical atrophy, and that of a partial failure of development. By some writers the three words are used synonymously with the meaning of either partial or entire failure of development. A few authors also use these terms with the significance of atrophy. The present tendency is strongly in the direction of giving to each word a distinct place in technical terminology: to atrophy, that of diminution in size after development; to aplasia and hypoplasia, that of imperfect development; to agenesia, that of total failure of growth or destruction of the part after it has begun to develop. Hypoplasia appears to have acquired the significance of a slight defect of growth; aplasia is used to indicate more important deficiencies.

The causes leading to imperfect development may operate at such an early period in fœtal life that organs or parts may entirely fail of development (agenesia), or later, before the completion of growth, so that the affected parts are not of normal size (aplasia, hypoplasia). Fœtal agenesias and aplasias play the chief rôle in the formation of monsters. The extra-uterine aplasias affecting the development after birth may lead to a reduction of size of the entire body or extremities, and to an imperfect development of the sexual apparatus.

Aplasia may affect the entire skeleton so that abnormally short individuals result (dwarfs), or the bones may be unsymmetrically developed (partial dwarfism). The bones of the head are very frequently affected, giving rise to the conditions known as microcephalus and micrencephalus. The central nervous system may show defective development, with or without changes in its bony covering; one of the hemispheres may be abnormally small or the entire brain may show a retarded growth. Next to those of the nervous system, aplasias of the genito-urinary tract are most common in occurrence. The uterus or the entire set of female generative organs, external and internal, may remain in an undeveloped state at puberty. The external organs of the male are also not rarely abnormally small, and in non-descent of the testicle aplasia of the organ usually takes place. Parts of the intestine may be so imperfectly formed as to consist of a narrow canal or a small fibrous cord; and in the development of the lungs the alveoli of portions of one or more lobes may be imperfectly developed. The kidney and liver may also suffer a greater or less imperfection of growth. Hypoplasias of the heart and vascular system have been thought to play an important part in the pathology of chlorosis and lymphatic struma.

Agenesia for the greater part leads to the production of monsters or to the development of malformations which may be of so serious a nature as to preclude the possibility of extra-uterine life. There may be absence of the cranium (acrania) (Fig. 59), or of the brain (anencephalus), or of the spinal cord (amyelia). A complete failure of development of any part of the skeleton may take place, or of any part of the nervous system. Agenesia may also result from the failure of developing centres to unite or of clefts to close; in the latter class are to be placed a great variety of malformations (cleft palate, hare lip, ecstrophy of the bladder, etc.). Agenesia of a single organ may also arise from the imperfect separation of two organs which develop from a single focus (cyclopia), or from the secondary union of two divided organs. Atresia of the mouth, nose, ear, anus, vagina, or urethra may also result from agenesic development of portions of these structures. Agenesia of the bones of the extremities, of single muscles or groups of muscles, of the auricular septum, etc., are among the more common malformations which permit of extra-uterine life.

The tissues composing aplastic organs may be normal in structure, but there is very frequently associated with abnormal smallness of the entire organ a deficient development of its elements or a complete absence of the more highly specialized ones. In aplasia of the central nervous system there may be agenesia of the ganglia cells and nerve fibres; portions of the brain may be represented by fibrous or membranous masses. The hypoplastic ovary may show complete agenesia of its ova; and in the lung there may be entire failure of development of the alveoli (Fig. 60). Likewise in the liver and kidney, portions of the secreting structures may fail entirely.

The causes of aplasia and agenesia may be either intrinsic or extrinsic.

As intrinsic causes may be considered all of those that arise in the germ either through inheritance or pathological germ variation, or through disturbances of the copulation of the sexual nuclei. The inheritance of agenesic malformations may be direct, atavistic, or collateral. Certain types of faulty development, notably those of the nervous system and genito-urinary tract, occur with a certain frequency in degenerative inheritance. The pathological germ variation may be the result of the union of two nuclei, one or both of which is abnormal, or of the union of two normal nuclei which are not suited to each other.

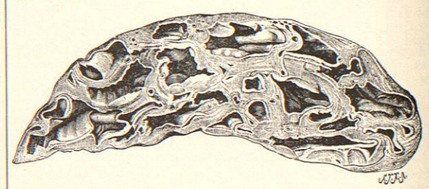

FIG. 60.—Agenesia of the Respiratory Parenchyma of the Left Lung. The lung consists of dense connective tissue in the midst of which dilated bronchi are found. (Horizontal section through the apex of the upper lobe. Natural size.) (Ziegler.)

But by far the chief causes of agenesia are extrinsic. Of these, pressure, jarrings, disturbances in the supply of oxygen and nutrition, contaminations of the maternal blood from intoxications and infections, fœtal inflammations, abnormal conditions of the amnion, play the most

important part. There is very strong evidence that a large proportion of agenesic malformations arise from abnormal adhesions between the embryo and the amnion, or to abnormal pressure exerted by the amnion upon the developing germ. The head and extremities suffer most frequently from these causes. Aplasia of the bones is sometimes associated with thyroid disease.

The agenesias of the more important structures of the body lead as a rule to the production of a non-viable fœtus. Only those failures of development affecting the body in such a degree that life processes are not seriously interfered with admit of living after birth. Dwarfism, agenesia of the bones or muscles of the extremities, many of the cleft malformations, agenesia of the sexual organs, etc., permit of life and extra-uterine growth. Some of these may be compensated for by hypertrophy of other organs or parts of the same organ, while others may be improved by surgical treatment.

Aldred Scott Warthin.

AGEUSTIA. See *Taste, Disorders of*.

AGORAPHOBIA.—A peculiar emotional neurosis in which morbid fear of being alone in an open space, or in analogous circumstances, is accompanied by the perfect consciousness that this fear is absurd, but with the absolute inability to overcome it.

As one of the psychic stigmata this state of neurasthenic anxiety or emotive obsession is the most frequent of the *phobias* and assumes the most varied forms. Although occurring in the blind, an attack may be produced by ideas of space, vastness, height, depth, eternity, or such kindred subjects. In certain degenerates these impulsive and emotional but groundless ideas show themselves in the deadly terror and anguish of *acrophobia, anaxiphobia, astrophobia, cremnophobia, hydrophobia, thalassophobia*, and *taphiphobia*, in all of which there are contradictoriness of sensory impression and inability to form an accurate conception of the surroundings.

SYMPTOMS.—Sudden weakness and muscular tremor render standing difficult. An attack may, however, be gradual. Tremor extends sometimes to the trunk, thence to the arm and lower jaw; sometimes a wavy sensation goes from the heart to the back of the neck. Chilly sensations in the back, stomach, breast, and limbs are followed by heat, redness of the face, profuse sweating, and violent palpitation. At the same time there is oppression and contraction of the pectoral muscles; the speech, abrupt and anxious, is sometimes momentarily impossible; intermittent pains, sharp, rapid, and fatiguing, following the trunks of the nerves, run along the legs, ascend the body, and extending to the arms, seem to lose themselves in the hollows of the hands; there is formication, with numbness in different parts of the body; festination is observed in some cases; in others emotional diarrhœa; and again sudden loss of motor power comes like a stroke of palsy, and the patient falls powerless with his face downward, in a state of waking nightmare.

But these physical troubles are only the outward and visible signs of the moral trouble that is the true primitive phenomenon and the cause of all the others. That which is pathognomonic and constitutes agoraphobia, is *terror*, up to its extreme degree, and consequent motor impotence. The single primitive phenomenon, as the name indicates, is *groundless fear*. Looking down a deep mountain gorge, hanging over the brink of a burning crater, crossing Niagara on a tight-rope, or falling from such a precipitous height as the Washington monument, are sensations less fearful and astonishing than those of an agoraphobe. This terror causes a patient to feel dumbfounded, thunderstruck, exhausted, and at the same time isolated from the entire world; space seems to extend to infinity under his feet; he feels persuaded that he will never accomplish a given journey; walk a certain distance without fainting; hold out for a certain time without food, or support existence for a certain period without fresh air. He experiences fear and want of self-confidence when in a crowd, at theatre, at church, or in a boat, omnibus, or railway car. An agoraphobe, unable to ride on a railway train without a brandy flask in the left hand and a Bible in the right, presumed that one counterbalanced the effects of the other. Fear to meet acquaintances; fear of spiders, mice, and snakes; fear of apoplexy and of death come over the patient like the fear that seizes a timid child in the dark; sensations like those of a swimmer deceived by false chances, or those of a victim to tantalizing hopes, cause the patient to be on the point of screaming or weeping, and he is, figuratively speaking, frozen with terror, motionless with fear, so great is the anguish that takes place during this psychic collapse.

Agoraphobic symptoms, though not new, are of recent introduction into science (1871). Two forms of agoraphobia are spoken of, namely, *primary* and *secondary*. The primitive form may occur suddenly in apparent good health and normal mental conditions; the secondary form occurs as an accessory phenomenon complicating a previous pathological condition; it is slow and progressive, and may coexist with other neuropathic conditions. *Primitive* agoraphobia may come on suddenly without assignable cause amid varying circumstances: in a boat, during a lecture, or while skating, at the sight of an extended horizon, or while looking at the summit of a high monument, as is the case with two of the writer's patients, who cannot look up to the dome of the Capitol or the summit of the Washington monument without being seized with agoraphobic symptoms. In one case a patient could not look out upon the sea without symptoms. There was also the "tormenting fear of heights," the rooms on a second story being unbearable; and the patient, in crossing a high bridge, always did so in diagonal lines to avoid the sight of the space between him and the water below. *Secondary* agoraphobia comes on slowly, generally in patients whose neurotic antecedents are bad. Numerous prodromes, more or less painful and persistent, are experienced, and at a certain time, while alone in a public place or highway, or under analogous circumstances. Intense emotion and momentary suspension of motor power complete the attack. These often disappear spontaneously, when the sufferer, in crossing a space, can fix his eye on some limited object, as a carriage, a street lamp, a tree, or an open umbrella held over his head; and often the companionship of a small child, or even the support of a stick, will act as a preventive. Among late cases is that of an officer who escaped agoraphobia, brought on at the sight of carriages and pedestrians, by always taking an orderly along and keeping in the least frequented streets. He did not have these symptoms outside of the city in a suburban village, nor did they come on when riding through a crowded street at the head of his regiment.

ETIOLOGY.—But little is known of the cause or of the precise nature of agoraphobia. Most of the predisposing or exciting causes of ill health or of neurasthenia may bring it about. In fact, one may become agoraphobic from moral weakness. The atrophy of will that allows imagination full career and gives rise to the superstitious fears, moral miseries, and morbid impressions that assail certain persons, may cause violent commotion of the organism with psychic sensations of terror. It is satisfactorily established that in agoraphobia there is a kind of moral softening, a nervous adynamia, a psychic insufficiency that may dominate the faculties of the individual and sterilize his acts. Whether the condition arise from organic insufficiencies, such as non-activity of the eye or of the ear, brain trouble resulting from anæmia, fatty heart, hemorrhoids, lesion of the cervix uteri, abscess of the liver, or from a morbid state of the ganglionervous apparatus; we are not prepared to say in the present state of our knowledge of the subject. But opinion warrants the statement that the pathological change in agoraphobia is cerebral, and arises from functional irritation of the cortical sensory centres forming the anatomical substratum of ideation.

DIAGNOSIS.—Outward signs of agoraphobia are in general facial. It should not be confounded with epilepsy, hypochondria, or the different forms of vertigo. Though closely allied to simple melancholia, agoraphobia is said never to occur in hypochondriacs. The morbid and excessive emotivity of agoraphobia is variable, while the influence of hypochondria is constant. Seeming impossibility to give clearer physical notion of the disease is due to the fact of its purely mental nature. It is a curious fact that none of the recorded cases has occurred in ignorant persons. Some are described as altruistic, others as suffering from human egoism with a tendency to complain, to weep, and to keep in the background generally. Nor did any of the cases have illusive transformation, but myopia and dyschromatopsia appear as associated elements. Suicidal impulses are reported to have occurred in several cases. The majority were in adult men of education and intelligence who in nearly every instance kept the symptoms concealed from every one as long as possible for fear of being thought insane. Cases of agoraphobia seldom or never reach asylums.

Conditions likely to be confused with agoraphobia are *basophobia* and *astasia-abasia*. In basophobia the patient by a sort of auto-suggestion persuades himself that it is impossible to stand upon his legs. In astasia-abasia he can neither walk nor stand, but not from fear; he has no timidity nor agony. The basophile has no dread of space; his only fear is inability to stand without agony. In astasia-abasia there is neither fear nor agony; only loss of memory of coordinate movements of station, which affects standing or walking.

PROGNOSIS.—As a rule uncomplicated agoraphobia is not dangerous. No definite period may be assigned for its termination. Forecast depends on the personality of the patient and upon the removal of physical conditions of which the complaint may be a sequence.

TREATMENT.—Drugs in agoraphobia are of less consequence than the removal of the cause, which is to be done mainly by moral treatment. The primitive form often disappears spontaneously, but the secondary form presents all possible and impossible difficulties that the neurologist may expect to meet. Antispasmodics, ergot, the bromides, tonics, and iron, cutaneous revulsives, cups, hydrotherapeutics, electricity, purple spectacles, and suggestion are among the useful indications. A case has been bettered after an operation for hemorrhoids; in another the symptoms disappeared after aspiration of the liver and draining pus from an abscess, and in a case with aural symptoms cure followed dilatation of the Eustachian tube. Two cases caused by tænia have been cured after removing the cause. Another case improved after residence in the country, a course of hydrotherapeutics, and the avoidance of tobacco. In addition to combating functional and physical alterations with proper medication, there must be a radical and complete change in the habits and surroundings, such as may be obtained from a sea voyage, and as much opposition as possible to the conditions in which the disease has originated; above all, the physician should order and enforce a course of moral gymnastics that shall train the patient's imagination, and tame his terror by progressive and regular steps.

Irving C. Rosse.

AGRIMONIA (*Agrimony*).—A genus of about a dozen species (fam. *Rosaceæ*), widely distributed through the Northern hemisphere. The species which has been chiefly used in medicine is *A. Eupatoria* L., common in both Europe and America. Its use is merely of historical interest, as the small amounts of volatile oil, tannin, and bitter substance impart but feeble aromatic and astringent properties, and it is now scarcely used.

H. H. Rusby.

AGUA AZUFROSA DEL TOPO CHICO, or "*San Bernabé.*"—Situated in state of Nuevo Leon, about eight kilometres north of the city of Monterey. Communication by way of the National Mexican Railroad. Chemical composition, Dr. J. Gonzalez y Lambert:

Solids.	Gm. per Litre.
Sulphurous acid	0.0027
Sodium chloride	0.0740
Calcium chloride	0.0100
Magnesium	0.0190
Bicarbonate of lime	0.0270
Bicarbonate of soda	0.0250
Sulphate of lime	0.1040
Silicate of alumina	0.0270
Silicate of lime	0.0850
Total	0.3737
Gases.	**c.c.**
Carbonic acid	2.5
Nitrogen	97.5
Total	100.0

Uses: In rheumatism, in dysmenorrhœa, in hepatic and splenic congestions, in phosphaturia, in certain neuropathies, in diseases of the skin, and especially in the treatment of nocturnal incontinence of urine. The water at the spring has a temperature of 41° C. There is a bathing establishment, which was founded by General Reyes.

N. J. Ponce de Léon.

AGUA CALIENTE.—This term, which in English is equivalent to "hot springs," occurs repeatedly in the list of the mineral springs of Mexico and of those parts of the United States which formerly belonged to Spain. Thus, for example, in the state of Michoacan, which lies to the south and west of that of Mexico, there are three springs which bear this name. The first is situated about 16 km. from the chief settlement in the municipality of Angamacutiro, and is reached by a rather poor driving road. It has a high temperature which is apparently constant, and the volume of water is quite large. Among the laity it has considerable reputation as a remedy for rheumatism and for affections of the chest. No bathing establishment has yet been built.

Another spring of nearly the same name ("El Agua Caliente") is situated in the municipality of Penjamillo. According to Zuñiga, the water of this spring is only lukewarm and is potable.

The third spring, which is known as the Agua Caliente de Yurécuaro, is located in the municipality of Yurécuaro. The temperature of the water is 30° C. It is recommended for the treatment of rheumatism and diseases of the skin. No bathing establishment exists.

In the state of Jalisco there are no less than eight springs which bear the name of Agua Caliente. They are the following: La Agua Caliente, in the municipality of Amacueca; Agua Caliente, in the municipality of Chiquilistlán; Agua Caliente de la Cofradía, in the municipality of Cuquio; La Agua Caliente, situated about 8 km. from the city of Ejutla; Agua Caliente, in the municipality of Teuchitlán; Agua Caliente de la Cuña, in the municipality of Yahualica; Agua Caliente Chica, in the municipality of Zapopan; and Agua Caliente, in the municipality of Zapotlanejo. Not a single bathing establishment exists at any of these springs, and in the case of only one of them does the report give even an attempt at an analysis of the water. The introductory portion of this report is quoted here in full. It explains some of the difficulties which were encountered by the Institute in its efforts to collect reasonably full data in regard to the mineral springs of the republic of Mexico:

"The National Medical Institute of Mexico has begun to publish the data that it has been able to collect regarding the mineral waters of our country, not only because it wishes to have their existence known, but because it hopes to have these data completed and corrected, if possible, by people living in the neighborhood of the springs, or by the physicians of the localities.

"The data collected by the Institute, as well as the waters of which the analyses are given in this report, have been forwarded to it almost exclusively by the

Governments of the different municipalities. Unfortunately, answers to the questions submitted to them have not been obtained in many instances, and in others some of the answers are incomplete. For this reason, and from the fact that there was not available a sufficient quantity of water from each spring for the purposes of a satisfactory analysis, it is possible that some of the statements made in this report are incorrect. They certainly are not complete; but we believe that the best method of completing them is to publish those that we have, in order that we may at some later date be furnished with those that are wanting. It is desirable that physicians should furnish us with their actual experience with these waters, because, although one may infer from the composition what their probable effects are, only practical experience can teach us the therapeutic uses of the same."*

N. J. Ponce de Léon.

AGUA DE VIDA SPRINGS.—Alameda County, California.

ACCESS.—Via Central Pacific Railroad, a three-hour ride from San Francisco, to Livermore, thence a few miles by carriage southeast to Springs, hotel, and cottages.

These springs are located in Arroyo Mucho, among the foothills of Cedar Mountain, at an elevation of 1,700 feet above the sea level. There are a number of mineral springs at this place, both carbonated and sulphureted. The lower drinking spring is of the former type. Its water is clear, sparkling, and exceedingly palatable. An analysis by Dr. Winslow Anderson resulted as follows:

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Sodium chloride	4.02
Sodium carbonate	3.65
Sodium sulphate	14.73
Potassium carbonate	0.55
Magnesium carbonate	7.95
Magnesium sulphate	0.46
Calcium carbonate	13.75
Calcium sulphate	0.10
Alumina	0.37
Silica	0.42
Organic matter	Trace.
Total solids	46.00
Carbonic acid gas	19.25 cubic inches.

The physiological action of this water is aperient, antacid, diuretic, and tonic. It is recommended in cases of acid dyspepsia and as a diuretic in cystitis and congestion of the kidneys.

The upper or larger spring is mildly sulphureted alkaline and saline, as shown by the following table of its contents:

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Sodium chloride	5.07
Sodium carbonate	2.25
Sodium sulphate	17.50
Potassium carbonate	Trace.
Magnesium carbonate	3.19
Magnesium sulphate	8.70
Calcium carbonate	11.92
Calcium sulphate	4.35
Manganesium carbonate	Traces.
Alumina	0.40
Silica	0.55
Organic matter	Traces.
Total solids	53.93

Gases: Sulphureted hydrogen, 2.74 cubic inches; carbonic acid, 9.25 cubic inches.

*The facts which we are able to publish in the present edition in regard to Mexican mineral springs have been furnished to us through the courtesy, first, of Porfirio Diaz, President of the republic, and next, of Dr. Fernando Altamirano, director of the National Medical Institute in the city of Mexico. The documents which contain this information are partly in printed and partly in manuscript form; and as they are all written in Spanish, Dr. Ponce de Léon, of this city, has very kindly undertaken to furnish concise abstracts from them in English.—EDITOR.

Temperature of water, 57.5° F. This water has a laxative influence, and as such is serviceable in abdominal plethora and chronic constipation.

Important improvements have recently been made on the grounds at Agua de Vida Springs. The naturally picturesque location has been further beautified by the construction of broad driveways, rustic bridges, cool arbors, and other pleasing adjuncts. The visitor will find an excellent hotel, surrounded by comfortable and spacious family cottages.

James K. Crook.

AGUA FRIA.—Municipality of Tajumarea, Michoacan, Mexico. "Agua Fria" embraces three mineral springs, viz., "La Rosa," "La Pela," and "La Laguna," distant about 20 km. from Ucareo. The waters are thermal, those of La Rosa having the highest temperature. According to Zuñiga they contain salts of sodium with hydrogen sulphide. There are no facilities for comfortable bathing, but the residents of the locality resort to the springs for the treatment of rheumatism, paralysis, and diseases of the skin.

N. J. Ponce de Léon.

AGUA HEDIONDA.—Situation, three kilometres to the northeast of the city of Cuautla, in Morelos, state of Morelos. Transportation, by way of the Interoceanic Railroad to the city of Cuautla, and by carriages thence to the springs. These waters derive their name from their strong odor of sulphureted hydrogen. They are located about three miles northeast of the city of Cuautla. The springs issue from the earth on the borders of a small ravine and discharge their united stream into the River Cuautla. At the source of the largest spring a pool of considerable size is formed, which is used for bathing. The overflow of this pool into the ravine forms a small cataract, which is utilized by the bathers as a natural douche or affusion. Another spring, also of considerable size, is located 120 metres to the west of the first spring. It also furnishes a very desirable natural bathing pool. Two more springs of smaller size are located in the vicinity. The waters of these springs have been subjected to a careful examination by Morales and Eduardo Liceaga. The water of spring No. 1 is described as being colorless and limpid, and forms no sediment. It has a bitter taste, and at the springs a sulphurous odor. On evaporation it shows a dried residue of about 124 grains per United States gallon, composed chiefly as follows: Sulphate of calcium, 70 grains; sulphate of magnesium, 30 grains; and choride of sodium, 17 grains. There are also small quantities of iron, silica, and organic matter, with carbonic acid and sulphureted hydrogen gases. The water is not adapted for general drinking purposes. Spring No. 2 is somewhat less strongly mineralized than No. 1, but contains essentially the same chemical ingredients, and possesses similar physical characteristics. Like No. 1 its water is not potable. The average daily temperature of these waters is 78° F. In small doses the waters are said to possess tonic and stimulant effects, and to promote the appetite and the activity of the digestive functions. An attempt was made many years ago, in 1854, to develop the springs as a health resort, but the enterprise was allowed to languish and the locality was almost forgotten. During the last few years, however, the springs are again coming into notice, and we are informed that in the course of the Mexican spring resort season, from October to February, an increasing number of persons come annually to avail themselves of the benefits of the baths. Persons suffering from scaly skin affections, from certain forms of paralysis, from rheumatism, and from hepatic, renal, and gastric disorders, are said to derive much benefit from a course at these springs. The valuable character of the waters found here, the picturesque location and attractive scenery, and the nearness of the waters to the city of Cuautla, all mark this as a mineral spring resort of some promise.

N. J. Ponce de Léon.