

or less explicitly discussed, the student's attention will be invited merely to the leading articles dealing specifically with status lymphaticus in its different aspects. Even in some of these articles the title refers directly to the thymus:

- Rokitansky: Path. Anatomie, Wien, 1842-46. Definitely mentions the lymphatic dyscrasia and plainly points out the coordinate relations of the enlarged thymus to the lymphadenoid hyperplasias.
- Virchow: Beiträge z. Geburtsh. u. Gyn., 1872. Discusses the relation of arterial hypoplasia and chlorosis and defines the "lymphatic-chlorotic constitution."
- Grawitz: Ueber plötzliche Todesfälle im Säuglingsalter. Deut. med. Wochenschr., No. 22, 1888. Reopens the discussion upon thymic, or, more properly, lymphatic sudden death, and marks what may be called the recent era in the study of status lymphaticus.
- Paltauf, A.: Ueber die Beziehung der Thymus zum plötzlichen Tod. Wiener klin. Wochenschr., No. 46, 1889, and No. 9, 1890. Clearly defines status lymphaticus by its morbid anatomical basis, and deals with various forms of lymphatic sudden death.
- Pott: Ueber Thymusdrüsenhyperplasie und die dadurch bedingte Lebensgefahr. Jahrb. f. Kinderheilkunde, No. 34, 1882. Deals especially with spasm of the glottis and resulting sudden death. The relation of status lymphaticus as the anatomical basis is kept in view.
- Nordmann: Ueber die Beziehungen der Thymusdrüse zu plötzlichen Todesfällen im Wasser. Correspbl. f. Schweizer Aertze, No. 7, 1894. As its title indicates, this paper deals especially with lymphatic sudden death in the water. Status lymphaticus in its anatomical and etiological relations is discussed, though the thymus claims most attention.
- Kundrat, V.: Zur Kenntniss des Chloroformtodes. Wiener klin. Wochenschr., Nos. 1-4, 1895. The relations of status lymphaticus to fatal surgical narcosis are there elucidated together with a number of original cases.
- Escherich: Bemerkungen über den sog. Status lymphaticus des Kindes. Berl. klin. Wochenschr., No. 23, 1896.—*Ibid.*: Tetanie. Traité des maladies de l'enfance, tome IV. Considers the various neuroses of status lymphaticus like tetany, spasm of the glottis, eclampsia, and lymphatic sudden death, and elaborates a theory to explain the association.
- Galatti: Zur prognostischen Bedeutung des Status lymphaticus der Kinder. Wiener med. Blätter, No. 50, 1896. Lymphatic sudden death is considered, including a discussion of fatal accidents after antitoxin injections as illustrated by the Langerhans case. Mentions the predisposition to cedema.
- Ewing: The Lymphatic Constitution and Its Relations to Some Forms of Sudden Death. New York Medical Journal, July 10th, 1897. An excellent review of status lymphaticus in its different aspects, with a presentation of most of the literature. Especially valuable as being readily accessible to the American student. Apparently the first article in English dealing with status lymphaticus *per se*.
- Ohnmacher: Bulletin of the Ohio Hospital for Epileptics, Nos. 1, 2, and 3, 1898-99. Several papers discussing especially the question of status lymphaticus and epilepsy.
- Daut: Ueber die Beziehungen des Status lymphaticus zur Diphtherie. Jahrb. f. Kinderheilkunde, Heft 2 and 3, 1898. As shown by its title, this paper concerns the relations of status lymphaticus to diphtheria and contains the most exhaustive study of this phase of the subject thus far published.
- Klein: Neuere Arbeiten über die "Glandula thymus." Zusammenfassendes Referat. Cent. f. allgem. Path. u. path. Anat., Nos. 16-17, 1898. Though primarily considering the diseases of the thymus, this review cites all of the important papers bearing on status lymphaticus, and reviews them briefly.
- Blake: The Surgical Aspects of the Status Lymphaticus. Annals of Surgery, June, 1902. The most recent American paper, the purpose of which is indicated by the title.

STAVESACRE.—(*Staphisagria*, U. S. P.; *Staphisagria Semina*, Br.; *Staphisagria*, Codex Med.) The dried ripe seed of *Delphinium Staphisagria* L. (fam. *Ranunculaceae*).

This seed is derived from a handsome annual or biennial species of larkspur, native of the South European countries, Asia Minor, etc., and also cultivated. The seeds are imported from the south of France and Italy. They were known to the ancients, and for twenty centuries have been used for about the same purpose as at present—killing pediculi and similar vermin.

DESCRIPTION.—About 5-7 mm. ($\frac{1}{8}$ - $\frac{1}{4}$ in.) long and nearly as broad, flattish-tetrahedral, one side convex, another small and opposite to a pointed extremity, the edges rather acute; brown, gray-brown, or sometimes blackish, strongly and coarsely reticulate-wrinkled, containing a whitish, or becoming gray-brown, oily perisperm and a small, straight embryo; nearly inodorous; taste very bitter, acrid, and somewhat biting.

COMPOSITION.—The seeds contain about twenty-five per cent. of a non-drying fixed oil, and about one per cent. of alkaloids, occurring mostly in the shell, of which the following have been isolated and named: *delphinine*, in fine, large crystals; *staphisagriline*, amorphous; *delphinoidine*, also amorphous; and *delphisine*, in crystalline tufts. Of these, the first is the most important and active, the second least so, while the third and fourth resemble the first, but are weaker.

ACTION AND USE.—Stavesacre is an active and poisonous drug, irritant to the skin and mucous membranes, causing itching, stinging, burning, sneezing, etc., as well as diarrhoea and vomiting. Of the alkaloids, delphinine best represents the drug; rubbed into the skin, this causes local inflammation, on the tongue burning and numbness, in the stomach nausea and distress, and, when absorbed, cardiac and respiratory slowing, diminished spinal irritability, and sometimes mental disturbance. The others resemble delphinine, but are less intense. Delphinine reminds one of both aconitine (to which it is botanically related) and veratrine. Staphisagriline is somewhat peculiar; it is not very active, but appears to resemble curare in its action upon striped muscle.

Neither the crude drug nor its alkaloids are given internally; so its exact action has but little practical bearing. It has from a remote time been employed, either by itself or in ointments or other vehicles, solely for the purpose of killing pediculi and related animal parasites, on man and animals. At the present time it is mostly consumed in veterinary practice, keroseine or petroleum, petrolatum, sulphur, and *Unguentum hydrargyri* taking its place in human medicine. An ointment can be made with twenty per cent. or so of the powdered seeds, or with from one-half to one per cent. of the alkaloid.

Larkspur seeds, the product chiefly of *Delphinium Consolida* L., and produced in Europe, are almost identical in constituents and properties with stavesacre. They were formerly official in the United States Pharmacopoeia, and tincture of larkspur is a very popular application for head lice. They are several times smaller than stavesacre seeds, of about the same form, but with sharper angles and markings, and usually of a jet black color.

Henry H. Rusby.

STEAMBOAT SPRINGS.—Routt County, Colorado. Post-Office.—Steamboat Springs. Hotels.

ACCESS.—Via Denver and Rio Grande Railroad to Walcott, thence by stage, a twelve hours' ride to springs. Also connected by good mountain roads with Laramie City, Wyo., and with Georgetown, Dillon, Glenwood Springs, Hayden, and other points.

The town of Steamboat Springs is located in a charming valley in northwest Colorado, just over the main range of the Rocky Mountains and near the headwaters of the Yampa River. The site is upon a bend of the Yampa, where, from its northerly flow, it turns sharply to the west. The mountain range here follows the contour of the river, lifting its lofty summits, covered all summer with their ever-melting but never-melted snow, on two sides of the valley to the north and east. Thus is formed a natural basin, sheltered on the side toward the north by its mountain bulwark, leaving its southern slope open to the rays of genial sunshine. Three large mountain streams—Soda Creek, Crystal Brook, and Spring Creek—rise at different points along the curve in the mountain range, and, converging as they flow down, join the Yampa on the town site. These streams furnish a never-failing supply of pure water, and, with a group of sixty varieties of hot, warm, and cold mineral springs, make this valley one of the most remarkable natural watering-places in the world. The first settlement was made in the valley in July, 1874, by Mr. James H. Cranford, the present manager of the springs. Since that time a flourishing town containing churches, schools, libraries, banks, newspapers, and other adjuncts of civilization, has sprung into existence. The town and vicinity offer many attractions to the enterprising settler, as well as to the tourist, the sportsman, and the invalid. The climate during the open season—i.e., from April until late in December—is ideally temperate, clear, balmy days and cool nights being the rule. The springs, one hundred and forty in number, yield an exhaustless supply of water, but they have not been fully developed yet. They range in temperature from 40° to 103° F., but none of them appears to have been subjected to a complete analytical examination. Among the prominent ingredi-

ents are soda, magnesia, iron, and sulphur. The waters have been found useful in rheumatism and skin diseases, and were resorted to by the Indians for many years before the appearance of the pale face in this region. A large bath-house with swimming pool and numerous bath-rooms has been built to utilize the water from the hot springs.

James K. Crook.

STEAPSIN. See *Pancreas*.

STEATOMA.—By many writers this term is used synonymously with lipoma; but by others it is applied to a hard variety of this tumor, in which the fat cells are of small size and the amount of connective-tissue reticulum relatively large. Such tumors resemble bacon in their gross appearance and have been designated by German authorities "Speck-tumor." In the majority of cases such tumors arise from the atrophy of the fat cells in any ordinary lipoma, and the characteristic appearance and consistence of the growth are, therefore, to be regarded as the result of secondary changes. Other writers apply the term steatoma to any variety of fibrolipoma, and the designation has even in a few instances been transferred to fibromata. By other writers still, atheromata, sebaceous cysts, and dermoid cysts, as well as retention cysts of varying origin containing fatty or pulaceous material, are also called steatomata. The varied and indefinite use of the term would appear to offer good reasons for its abandonment.

Alfred Scott Warthin.

STERIFORM. See *Formaldehyd*.

STERILITY IN THE MALE. See *Sexual Organs, Male, Diseases of*.

STERILITY IN WOMEN.—

"If a woman do not conceive, and wish to ascertain whether she can conceive, having wrapped her up in blankets, fumigate below, and if it appear that the scent passes through the body to the nostrils and mouth, know that of herself she is not unfruitful."—*Hippocrates, Aphorism 59*.

Sterility (from *στερεος*, "barren") in woman is an inability to conceive or bring forth a living child. Inability to conceive is called absolute sterility; inability to complete gestation is denominated relative sterility. It may be congenital and due to some insuperable error of conformation, or it may be acquired as the result of some local or general barrier. When a woman has never been able to conceive it is called primary sterility; when she has conceived one or more times, but is unable to conceive again, it is called secondary; when she can conceive, but is unable to carry the child to full term, it is called comparative sterility.

Prior to puberty, during lactation, and after the menopause, sterility is physiological.

The generally accepted ratio of sterility among civilized nations is eleven per cent. In primitive conditions and rural communities it is much less than in complex civilizations and in cities. Rich diet and luxury seem to be inimical to fertility; spare diet and poverty appear to increase fecundity. Sterility is rapidly increasing in the United States, especially in native-born white women. Prior to 1850 it was only two per cent. In 1900 it was twenty per cent. Among foreigners in the United States it is thirteen per cent. It is greater in the United States than in any country except France (Engelmann).

The fecundity in some parts of Europe is eight to a family; the average is five to a family. In the United States there are only two children to a family. In women who are college graduates the ratio is 1.6 to a family.

The causes of this increase of sterility are many. They are moral more than physical. Distaste for the burdens of maternity, from motives of ease and on account of the demands of society, is a prominent cause. The prevention of conception and the production of abortion are increasing ominously. The sin of Onan is making its moral and nervous wrecks. The abomination which

Mme. De Staël describes as "a cobweb as regards protection and a bulwark against love" is ever more frequently employed. The marital approach is often guarded by the paraphernalia of the brothel. The secular and religious press is besmirched by advertisements of so-called emmenagogues; of sundry ingenious syringes, and other devices to thwart nature in the procreation of the species. These latter causes for sterility must be taken up by the political economist and prevented by legislative enactment. The increase of sterility from these reprehensible immoral practices, if not restricted, will be an occasion for national alarm. Mathews Duncan says:

"A healthy woman living in wedlock all of her child-bearing life under the most favorable circumstances for natural procreation, should have a family of ten. Women, under such circumstances, bearing fewer than ten, are relatively sterile, and the sterility is inversely as the number." He found the mean interval between marriage and the birth of the first child to be seventeen months; and that the likelihood of conception proportionately decreased thereafter. Only twenty-five per cent. of women bear the first child after four years of wedlock. A woman, therefore, who has been married three years without conception, and where no means to prevent it have been resorted to, may be presumed to be sterile.

Simpson out of 1,252 marriages found 1 in 8.5 unfruitful. Ansell, in the British peerage, found 1 in 6 $\frac{1}{2}$. Engelmann among college graduates, 1 in 3 $\frac{1}{2}$. Duncan says the average for Great Britain is 1 in 10, which may be taken as the general average.

In all sterile matrimonies it must be borne in mind that the male may be at fault. Gross, in 192 instances, found the male to be at fault in 16 $\frac{2}{3}$ per cent. Kehler, in 40 cases, found 31.5 per cent. Emil Ries estimates 30 per cent. Vedder, of Christiania, in 310 examples, found 70 per cent. due to the male, either to impotency or azoospermia. He includes infection of the wife by gonorrhoea, but this should not be included in an estimate of essential male sterility. Gonorrhoea in the male, resulting in double epididymitis and occlusion of the vas deferens, is the greatest factor. Surgical relief from this asexualization of men is much to be desired.

Assuming that from one-third to one-half of all childless marriages are due to the male, the woman should not bear the reproach until a microscopical examination of the semen of her partner is made, to determine the absence or presence of living, healthy spermatozoa.

CAUSATION.—Any cause which prevents the meeting of virile spermatozoa with a perfect ovule in the genital passages of the woman, and their further fixation and retention in the uterus until gestation is completed, will result in sterility. These causes may be generalized as follows:

- I. Incapacity for perfect copulation.
 - II. Inability of spermatozoa to enter the uterus, or anything that may prevent the occurrence of fixation after insemination of an ovule.
 - III. Imperfect ovulation or tubal impediments.
 - IV. Failure of the uterus to retain the embryo.
 - V. Sexual incompatibility.
 - VI. General diseases or diatheses.
- Anatomically, these causes are found to be malformations or pathological conditions of (A) vagina; (B) uterus; (C) Fallopian tubes; (D) ovary.
- (A) *Vagina.*—Absence, incomplete development or atresia of the vagina; imperfect hymen and congenital narrowness or shortness of the vagina; adherent labia minora; abnormal communication between the vagina and the bladder, rectum, or urethra; vicious insertion of vagina; double vagina, transverse hermaphroditism; vaginismus or dyspareunia from any cause; laceration or relaxation of the perineum; vaginitis; genital fistulae; elephantiasis and tumors of the pudenda; prolapsus of uterus and vagina.
- (B) *Uterus.*—(a) Cervix: Atresia or stenosis of the os or cervical canal; hypertrophy of the whole or of one of the segments of the cervix; elongated cervix; contrac-

ture of cervical canal from injudicious use of caustics or improperly performed trachelorrhaphy; endocervicitis.

(b) *Corpus*: Flexions, or versions; neoplasms; inflammation of the endometrium; infantile uterus, uterus unicornis or bicornis; non-development of cavity from arrested development of Müller's canals; subinvolution, hyperinvolution, or atrophy after labor or curettage.

(c) *Fallopian Tubes*.—Congenital absence or impermeability; closure of fimbriated extremities by gonorrhœa or other inflammation; salpingitis; destructive secretions; inflammatory impermeability of canal; peritoneal adhesions causing mechanical flexures; occlusion due to pressure of new growths.

(d) *Ovary*.—Absence, or imperfect development; acute or chronic oöphoritis; cystic degeneration; neoplasms; prolapsus of ovary; embedding adhesions.

I. Incapacity for Copulation.—The abolition of this function, which is usually essential for insemination, is, if permanent, an absolute bar. Insemination is not dependent upon sexual desire or sexual pleasure. It may occur in totally frigid women, or in those who have a positive disgust for the act. Pregnancy may occur if the genital passages are clear, when copulation is performed by force, as in rape, under anaesthetics, alcohol, or other drug narcosis. The deposition of semen on the pudenda, without intromission, has been known, indubitably, to have produced conception.

However, in sterility, any abnormality about the vulva and vagina should be detected. Imperforate hymen, adhesion of the labia, and atresia of the vagina are quite obvious causes.

Vaginismus, by its spasmodic contracture of the sphincter of the vagina, may incapacitate the woman for the marital relation. Dyspareunia, from vulvitis, vulvar hyperæsthesia, urethral caruncles, and pelvic inflammatory diseases, may interfere with coitus to such an extent as to preclude conception, although the woman is potentially fertile. Due care in eliciting the history and making the examination will disclose one or more of the many causes of this painful intercourse. An unusually short vagina may not retain the semen, or it may be violently evacuated by involuntary vaginismus of the upper part of the vagina (Storer). Relaxations of the vulvar orifice from laceration of the floor of the pelvis may also allow the semen to escape prematurely. The extreme acidity of a profuse leucorrhœa from a vaginitis is destructive to the spermatozoa, which require an alkaline medium.

II. Inability of the Spermatozoa to Enter the Uterus, or the Presence of Some Condition which does not Permit Fixation to Occur after the Insemination of an Ovule.—Formerly it was supposed that flexures of the uterus at or near the cervix offered a mechanical obstruction to the entrance of the spermatozoa; but it is now generally believed that if the obstruction, so called, will allow the exit of the menstrual flow, it will also allow the entrance of the spermatozoa. The sterility in flexions of the uterus are due to the attendant endometritis, the discharges from which may mechanically wash away or destroy the spermatozoa. Furthermore, the altered state of the uterine mucous membrane, in cases of this nature, will not permit fixation to occur.

While atresia or stenosis may prevent entrance of seminal fluid, the thick, tenacious plug of mucus, in cases of endocervicitis, more often acts as a barrier.

Coincidence with elongation of the cervix prevents insemination because the cervix does not rest in the pool of semen bathing the posterior fornix of the vagina. The same difficulty exists when the cervix is either anteflexed or retroverted; in other words, the spermatozoa are shut off from the opportunity of entering the uterus by their ciliary movements. In uncomplicated retroversion a restoration of the uterus to its normal position may lead to the occurrence of pregnancy after years of unfruitfulness.

Anteflexion, associated with dysmenorrhœa, is often found in barren women. Sims' observation, that nearly half of the women with dysmenorrhœa are barren, means that the barrenness usually depends upon some patholog-

ical process causing the dysmenorrhœa. In anteflexion the pathology is that of an atrophic endometritis, usually associated with imperfect development. The painful menstruation is dependent upon the faulty desquamation of the endometrium and the resulting coagulation of the blood. In these cases of flexion it is not, as was formerly taught, the obstruction to the outflow which causes the dysmenorrhœa, but rather the associated endometritis; for when the latter is cured, as it may be by divulsion and curettage, the dysmenorrhœa disappears. Such a cure of the endometritis, furthermore, means the reproduction of a new and healthy endometrium, and so favors the cure of the sterility.

Fibroid tumors were found to be the cause of sterility in 18.3 per cent. (III). Here, again, we may refer the sterility to the hypertrophic endometritis which accompanies the growth of these tumors; for the ovum cannot effect an attachment to the wall of the uterus during the progress of such an inflammation. In brief, then, whenever the uterus is at fault in a case of sterility, it will be safe, in the majority of instances, to attribute the cause of such sterility to an endometritis.

III. Imperfect Ovulation and Tubal Impediments.—Absence and faulty development of the ovary and oviduct are rare without congenital absence or malformation of some other part of the genital apparatus. Arrest of the function of the gland may ensue from acute or chronic inflammations, from cystic degenerations that are complete and bilateral, and also from obliteration of the glandular structures by new growths.

Inflammatory sequelæ of infections ascending to the peritoneum are the most important causes of sterility arising in the adnexæ. The ovary may be prolapsed or placed beyond the reach of the infundibulum, or it may be surrounded with inflammatory exudate so that extrusion of an ovule is impossible. The tubes may be, as seen very commonly in abdominal work, glued up at the abdominal ostia by inflammatory exudate. The fimbriae may be so distorted that they cannot come in contact with the ovary. Intrapertoneal bands of adhesions sometimes cause a narrowing of the lumen of the Fallopian tube. The endosalpinx, after inflammation, is commonly desquamated of its ciliated epithelium. The spermatozoon cannot make its way to the ovary, nor the ovule to the uterus. If perchance they should meet and fertilization ensue, tubal pregnancy is likely to occur. The tubes, after serious inflammation, may remain permanently occluded.

Any one or more of the conditions enumerated above are thus seen to be potent in the production of sterility by interference with ovulation and with the transit of the ovum. They may result from clinically mild infections, which, after resolution has taken place, may leave the patient, except as regards the sterility, in good health.

The comparatively recent recognition of the ravages caused by gonorrhœa in woman affords strong confirmation of Tait's contention that practically all women who have suffered from gonorrhœal infection of the tubes are sterile. Witness the notorious sterility of prostitutes, which is largely due to this cause. The point of greatest importance is to determine what proportion of these patients are hopelessly so, and what proportion may be relieved by conservative surgical operations. It is for the future to determine whether laparotomy is indicated for the cure of sterility alone. The lesions resulting from gonorrhœa comprise perhaps the largest group of the mechanical causes of sterility.

IV. Failure of the Uterus to Retain the Embryo.—This particular one of the procreative phenomena does not come under the scope of this inquiry. Habitual abortion, however, should always arouse the suspicion that one or both parents are infected with syphilis; and if other facts seem to bear out this view, active antisyphilitic treatment should be inaugurated. The results of such treatment are often very satisfactory.

Early abortions are very frequent. Ninety per cent. of child-bearing women abort once or oftener. One out of twelve pregnancies is said to end in abortion. It may

be caused by trauma, by emotional violence, or by pelvic and general disturbances. The underlying cause may reside in either the father, the mother, or the foetus.

Endometritis and laceration of the cervix are perhaps the most frequent, curable, local causes.

V. Sexual Incompatibility.—There is an intangible, unknowable something which causes sterility in the apparent absence of any pathological condition whatever, and this something, for want of a more exact term, we call incompatibility. Husbands and wives, each of whom has previously been fruitful with another mate, or each of whom at some subsequent period becomes fruitful when joined to another mate, will live together for years and yet will have no children. History furnishes the notable example of Augustus and Livia, and the well-known instance of Napoleon and Josephine. A satisfactory explanation is the despair of science. This form of infertility has been noticed in the breeding of animals.

VI. General Disease, or Weakness.—Obesity, with its attendant anæmia, is often the cause of sterility. It is presumed that the ovule is imperfectly matured. The rheumatic or gouty diathesis probably acts by nutritional defects, as does syphilis. Chronic alcoholism sometimes is causative through depreciated vitality. Unhygienic occupation and excessive wear and tear may prevent conception. A depressed state of the nervous system may suspend ovulation temporarily; hardships, grief, great mental anxiety, shock, unhappy marital relations, are mentioned as causes. Neurasthenia and certain nutritional neuroses render conception unlikely.

Tuberculous subjects are not necessarily infertile. Gestation greatly increases well-being, but parturition and lactation render the victim susceptible to the ravages of the disease. Prolonged lactation grants the woman partial immunity from conception, and is frequently used for that purpose, at the expense of both mother and child.

Prognosis is notoriously uncertain. Removal of palpable causes gives a fair prospect of success, sufficient to justify any reasonable effort, but a full statement of the improbabilities should be made to the patient. Sometimes when every discernible obstacle has been removed, sterility still persists. One should not, however, give a positive opinion that the case is a hopeless one unless some malformation presents an insuperable bar.

Conception has been known to occur under most unfavorable circumstances. Pregnancy constitutes a serious complication in fibroid tumors, and sometimes in carcinoma. It has occurred in cases of vesico-utero-vaginal fistula. Koeberle's remarkable case of abdominal pregnancy occurring through a small fistula, after vaginal hysterectomy, where a portion of the ovary was left, is unique.

TREATMENT.—A minute and painstaking search for the cause or causes of this condition is essential to any therapeutic attempt. If no appreciable cause is found in the woman, or before any elaborate plan of treatment is instituted if the cause is found, the presence and viability of spermatozoa should be determined. Men are loath to have an examination made that may fix the responsibility on them. In order to obtain a specimen for examination an ingeniously framed excuse, if necessary, may be made to the woman for an examination shortly after coitus.

Male potency being assured, the physician should then proceed to correct or remove any and all abnormalities possible in the genital canal, and also to remedy any systemic faults which may exist. Vulvar or vaginal impediments should be removed and the copulative tract put in a healthy state. Displacements of the uterus are to be corrected by appropriate means. Lacerations should be repaired, if necessary.

General hygienic measures are to be employed where necessary, with especial attention to anæmia and the diatheses. Higher education is unpropitious for a race of mothers. Great sexual moderation should be enjoined. Abstinence for a period of months, or, if need be, a complete separation for the same length of time, is often followed by conception. Such a separation gives an opportunity for a spontaneous cure of certain slight patho-

logical states, and affords a much-needed sexual rest. Hyperinvolution and ill-developed uteri are treated by intra-uterine galvanism. Great persistence is required in this and all other treatment for sterility.

The former practice of treating an atrophic endometritis, in anteflexion, by simply dilating the cervix has now given place to divulsion of the cervix and subsequent curetting. This plan of treatment is applicable to the majority of cases of endometritis which complicates so many pelvic disorders and upon which sterility so frequently depends. The results obtained are quite satisfactory. Excessive acidity is overcome by alkaline injections before congress.

In the operative treatment of tubal and ovarian disease causing or associated with sterility, conservative surgery is indicated wherever possible and has yielded very happy results in some instances. When child-bearing is desired, the surgeon is justified in exercising much latitude in saving and repairing structures. The justification in invading the peritoneum for tubal sterility unaccompanied by symptoms of disease, is an open question. Goffe has operated four times upon the uterine adnexa through the vagina for the uncomplicated symptom of sterility, and has been rewarded by living children in three of the four cases. Colpotomy is quite as safe now, from a surgical standpoint, with asepsis and expertness, as many of the recognized operative methods on the uterus for sterility were three decades ago.

The frequent cure of the associated sterility, while incidental, has been observed by every operator who has done conservative operations on the internal organs of generation. The following list of conservative procedures mentioned by Kelly will indicate the many checks to conception which might be removed:

1. The release of adherent tubes.
2. The opening or resection of closed tubes.
3. The emptying, cleansing, and sterilization of inflamed tubes.
4. The amputation of diseased tubes.
5. The excision of diseased or of strictured tubes.

Conservative operations on the ovaries comprise puncture or excision of a small cyst, resection of diseased portions, and release from embedding adhesions. A prolapsed ovary should be sewn back on top of the broad ligament and in relation with the infundibulum.

Before deciding upon an intrapelvic operation for the relief of certain pathological conditions, all the facts should be plainly set before the patient and her husband, in order that they may determine intelligently whether they are willing to incur the discomfort and danger, though slight, of an operation, the result of which is more or less problematical.

Artificial Conception.—This ingenious thought of Sims had for its basis the mechanical obstruction, in the cervix, to the further advance of the spermatozoa. It may be asserted that wherever this passage is sufficiently patulous to allow the nozzle of a syringe to be introduced for purposes of artificial impregnation, the spermatozoa are likely to effect an entrance unaided.

Of the fifty-five efforts made by Sims in two years only one resulted in conception, and that ended in an early miscarriage. A few other cases have been occasionally reported, but the procedure has never had the sympathy of the profession and has practically been abandoned.

Aside from the economic consideration of the importance of sterility to society, it must be borne in mind that it may be the cause of unspeakable disappointment and sorrow to the babeless bosom, and the mother-love will cry out in despair, "Give me children or I die."

William D. Haggard.

STERNUTATORIES, or errhines, are substances which, when applied to the nasal mucous membrane, cause sneezing and increased secretion. Properly speaking, there is a distinction between the two terms, errhine being used to denote an agent which increases the nasal secretions, while a sternutatory causes sneezing only. But as the act of sneezing is almost always accompanied by in-

creased secretion, the distinction between the two classes of remedies is practically without a difference.

In former times sternutatories were much more commonly employed than they are at present, and the older writers were wont to lay great stress on the efficacy of these agents in the treatment of many apparently dissimilar conditions. Their use was recommended (1) to restore suspended respiration; (2) to effect the expulsion of foreign bodies from the air passages; (3) to increase the secretion of the nasal mucus or of the tears, or to expel accumulated mucus from the sinuses; (4) to awaken the action of the encephalon, restore sensibility, or excite uterine action. At the present time remedies of this class are out of fashion, and the only applications to which they are put are to excite sneezing for the sake of the pleasurable sensations that it causes, to increase the nasal secretions in the dry stage of coryza, and to clear the nasal passages and the adjacent sinuses of accumulated mucus. It is possible, however, if the present tendency of attributing many and diverse morbid conditions to the score of nasal reflexes should prevail, that future generations will restore the sternutatories to their ancient rank among the most prized of therapeutic agents.

The list of substances which have been employed at one time or another for the purposes above enumerated is as long as the moral law, and embraces nearly every drug which can be reduced to a fine powder, and even many gases, such as ammonia. To enumerate only a few of them, we have rosemary, lavender, peppermint, spearmint, white and black hellebore, stavesacre, mustard, euphorbium, betonica, ginger, iris, the peppers, calomel, bismuth, the alkaline carbonates, ipecac, tobacco, sweet marjoram, and a host of others. At present this list is practically restricted to half a dozen substances, the chief of which are tobacco, ipecac, veratrum album, quinine, camphor, and cubeb. Tobacco snuff is seldom employed now, except as a luxury, but the others just mentioned enter, one or all, in varying proportions, into the composition of the different catarrh snuffs prescribed by physicians or sold as proprietary remedies.—From the first edition of the HANDBOOK.

STETHOMETER. See *Respiration*.

STETHOSCOPES.—HISTORICAL SKETCH.—The credit of having invented the stethoscope has been variously attributed to Hippocrates, Bayle, Hook, Laënnec, and others. It is certain, however, that Laënnec was the first to make the idea practically useful. He hit upon it accidentally, by using a roll of paper which he was holding in his hand. His first instrument was a cylinder of paper compactly rolled and kept in shape by paste. The stethoscope subsequently adopted was a cylinder of wood an inch and a half in diameter and a foot long, perforated longitudinally by a bore three lines wide, and hollowed out into a funnel shape at one end to the depth of an inch and a half. A plug of wood fitted into this hollowed extremity with a perforation through it of the same diameter as that of the rest of the tube. This was used in auscultating heart sounds. It was discarded in stethoscopes made at a later date. The instrument was made in two sections for convenience of carrying. Piorry introduced a more slender instrument, with ivory cap, and later this was altered and made of wood only. An instrument in which the pectoral end was trumpet-shaped was devised by Dr. Williams,

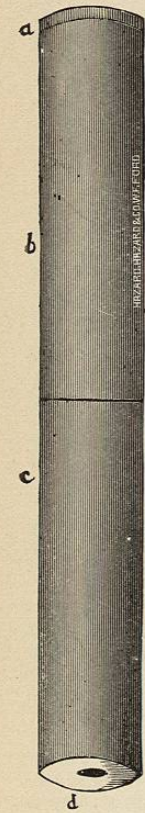


Fig. 4484.—Laënnec's Stethoscope. a, Plug; b, c, sections; d, aurial extremity.

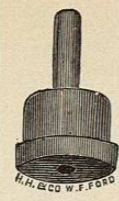


Fig. 4485.—Plug of Laënnec's Stethoscope.

of London, about 1843. Since then a large number of monaural stethoscopes have been devised, and descriptions of them are to be found scattered through various medical publications. They have been made of metal, wood, hard rubber, papier-maché, and other materials, used either alone or in combination. Most of these stethoscopes are hollow, the bore of the tube being pretty uniform throughout, except at the pectoral extremity, where it is expanded and bell-shaped. Solid wooden stethoscopes have also been devised, but these are more especially useful in conveying percussion sounds when the method of auscultatory percussion is practised. The monaural instruments do not differ from one another in any important particular. A few are combination instruments, having a percussor and pleximeter attached, or a clinical thermometer, a female

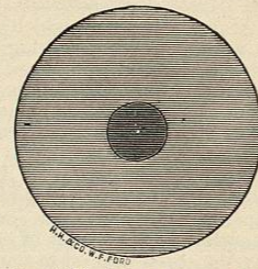


Fig. 4486.—Actual Diameter of Laënnec's Stethoscope.

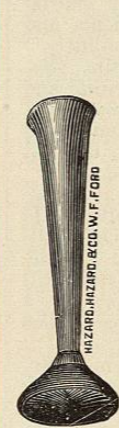


Fig. 4487.

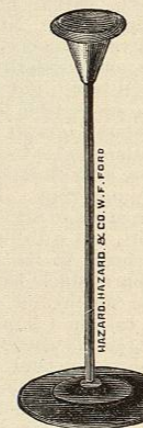


Fig. 4488.



Fig. 4489.

Figs. 4487, 4488, AND 4489.—Monaural Stethoscopes.

catheter, etc., hidden away in them. Among others who have devised monaural stethoscopes may be mentioned Quain, Stokes, Arnold, Barclay, Elliottson, Dobell, Loomis, Burrow, Clark, Cammann, and Ferguson.

M. Landouzy, of Paris, in 1850, constructed a stethoscope with a bell-shaped chest-piece, with a number of flexible tubes attached, by which several observers at once could auscultate. A single tube was designed for each person, but by the use of two tubes it became a binaural instrument. It was necessary to hold the tubes in the ears by the hands, and it was not found to be of much practical use. Many years previously Dr. Williams, of London, had been accustomed to use a binaural stethoscope made of two metal tubes attached to the bell of an ordinary stethoscope, and with flat ear-pieces. This conveyed sound with increased intensity, but was inflexible, clumsy, and awkward of application. The double stethoscope of Dr. Leared, shown in the Great International Exhibition of 1851, was a great improvement. It is made entirely of gutta-percha. The two tubes are attached at one extrem-



Fig. 4490.—Intercostal Solid Cedar Stethoscope.

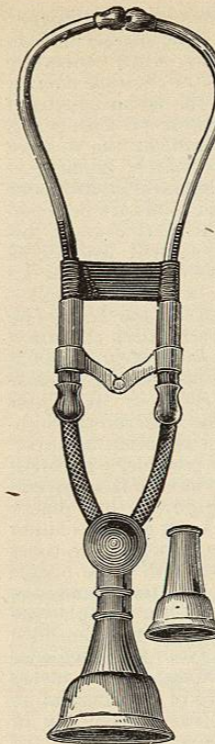


Fig. 4491.—Cammann's Binaural Stethoscope.

ity to a bell-shaped chest-piece, and at the other to ear-pieces similar to those of the monaural stethoscope. These tubes being separated and applied to the ears, exerted a certain amount of pressure by their own elasticity. To use this instrument ordinarily in practice, however, would require three hands, one for each ear-piece, and another to manage the pectoral end. In 1851 Dr. Marsh, of Cincinnati, patented a double stethoscope. This had a membrane stretching over its objective end, and two gum-elastic tubes leading from the chest-piece to the ears. In this instrument the ear-pieces were inconvenient, and the sounds conveyed were muffled and confused. These circumstances rendered it of little value.

Dr. G. P. Cammann devised a binaural stethoscope which, after considerable labor and expense, was perfected in 1852. He was familiar with the instruments of Landouzy and Marsh, and his stethoscope, therefore, was not a new invention, but was, and is now, the best instrument of the kind devised. It is light, durable, easily carried, and a good conductor of sound. The attachment of a rim of soft rubber to the chest-

piece, as devised by Dr. Snelling, is of advantage in some cases in applying it more closely to the inequalities of the chest. Oval chest-pieces are also made, which enable the end of the stethoscope to be pressed into the intercostal spaces. In most of the instruments now made the rubber band which served to draw the two tubes together is replaced by a spring. In the latest improvement the spring is placed in the screw which binds the tubes together (Fig. 4495).

A considerable variety of flexible stethoscopes are now in use. The credit of having first used one is probably due to Dr. Pennock, of Philadelphia. They may be generally described as consisting of a chest-piece, long flexible rubber tubes, and round ear-pieces. The ear-pieces are held in place either by being firmly pressed into the meatus, or by a spring passing over the head or under the chin. A flexible stethoscope was devised by Mr. Brown, in which the ear-pieces are oval. When placed in the ear, with the long diameter vertical, they are said to remain readily in position. The differential stethoscope of Scott Alison is similar in mechanism to Cammann's, but has two chest-pieces, one for each ear, enabling the

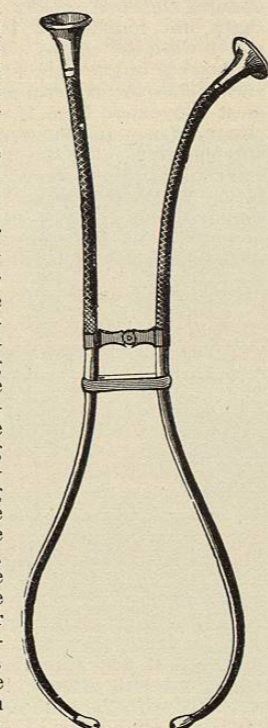


Fig. 4492.—Scott Alison's Differential Stethoscope.

sounds from different regions of the chest to be conveyed to the two ears at the same time. The hydrophone is another instrument devised by Alison. It consists of an india-rubber bag about the size of a large watch and filled with water. Another inventor had previously constructed a wooden instrument filled with water, but it was not practically useful. Alison found that when water was interposed between two conducting media, sound was conveyed to the ear with increased intensity. The hydrophone may be employed as an instrument by itself, or in aid of the stethoscope.

Dr. McBride has devised for use in auscultatory percussion a solid binaural stethoscope of hard rubber, with chest-piece sufficiently small to fit in the intercostal spaces. Dr. Constantin Paul devised a stethoscope with two flexible tubes leading to the ears, and a hollow chamber in the chest-piece connected with a rubber bulb by a long flexible tube. If the air in the hollow chamber is exhausted the instrument is held firmly against the chest. A modification of the chest-piece of Cammann's binaural stethoscope, which can be screwed on in place of the usual chest-piece, has been devised by the writer. In the pectoral end is an air chamber, which is completely closed by pressure against the chest. Connected with this chamber by a small tubular opening is a rubber bulb, through which the sound-conducting tube passes. By pressure upon this bulb, when the instrument is held in position, the air is exhausted in the hollow chamber and the stethoscope is held firmly to the chest wall.

Dr. Heineman, of New York, has devised an attachment to the binaural instrument, in which, by an admirably arranged piece of mechanism, the stethoscope is held firmly against the chest by means of a metal rod extending from the chest-piece to the chin, and both hands are left free.

Dr. T. O'Kelly has devised a similar arrangement of a metal rod surmounted by an india-rubber cushion upon which the forehead rests, thus enabling the stethoscope to be held firmly in position. Dr. D. M. Cammann devised a binaural hydrophone with the two tubes made of hard rubber, and thin hard

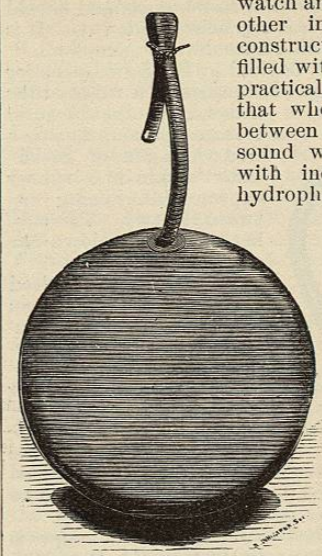


Fig. 4493.—Alison's Hydrophone.

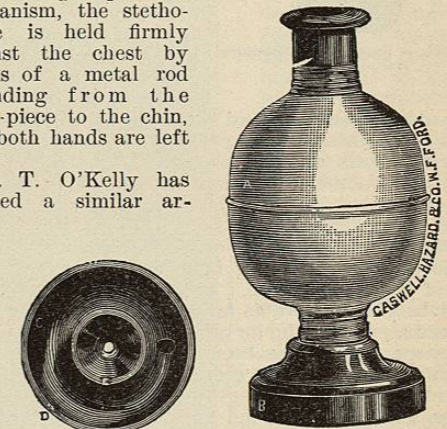


Fig. 4494.—Cammann's Modified Chest-piece. A, Rubber bulb; B, pectoral end; C, air chamber closed by pressure against the chest; D, outer rim; E, inner rim.