

23 per cent. of grave hemorrhages, and 17 per cent. of recurrences of the tumors. There were 29 cases in which various surgical procedures through the natural passages were resorted to, and the results were made known. The cures amounted to 86 per cent., the failures about 7 per cent., the hemorrhages about 17 per cent., and there were no deaths reported. There were 47 cases in which electrical operations were performed and the results recorded. The percentages were as follows: Cured, 81 per cent.; improved, 16 per cent.; failures, 2 per cent. No deaths were recorded. By combining all of those operations which were performed by way of the natural passages, for the purpose of comparing the results with those obtained after preliminary procedures, it will be found that the percentages are as follows: Cured, 83 per cent.; improved, 9 per cent. A comparison of the various methods is afforded by the following table.

ANALYSIS OF METHODS.

	Total cases.	Less cases in which results are not given.	Total case histories.	Cured.	Improved.	Died.	Failure.	Hemorrhage.	Recurrence.
Resection of palate...	9	-3	6	3	..	..	..	1	3
Resection of superior maxilla.....	10	-4	6	4	..	2	..	1	1
Resection of nose.....	11	-10	1	..	..	1	..	1	1
Total.....	30	-17	13	7	..	3	..	3	5
Evulsion.....	27	-9	18	16	..	..	..	3	2
Cold snare.....	21	-10	11	9	..	..	..	2	..
Total.....	48	-19	29	25	..	..	..	2	5
Electrolysis.....	34	-3	31	23	7	..	1	..	..
Galvano-cautery loop.	15	-8	7	7	..	..	..	..	..
Galvano-cautery loop with electrolysis...	1	-0	1	1	..	..	..	..	..
Galvano-cautery.....	4	-0	4	3	..	..	..	..	1
Galvano-cautery with evulsion.....	4	-0	4	4	..	..	..	..	..
Total.....	58	-11	47	38	7	..	1	..	1

**LIPOMA.**—A lipoma is a tumor composed of fatty tissue produced from a matrix of lipoblasts and may be either circumscribed or diffuse. Its occurrence in the pharynx is exceedingly rare, and the symptoms to which it gives rise are characteristic of a foreign body in the throat. When the growth is soft, it may be mistaken for an abscess; but the symptoms and history of pus formation are lacking, and an exploratory puncture is decisive of this question.

If the tumor is pedunculated, it can be removed by one of the methods described for fibroma, viz., by the cold or the hot snare or by the electric knife; otherwise electrolysis is to be preferred.

**ANGIOMA.**—This term is used in a broad sense by throat specialists to include all vascular tumors, in conformity with the classification of Virchow. Strictly speaking, the growth consists of new blood-vessels that communicate with the surrounding vessels, of interstitial tissue like that from which the tumor springs, and of the blood within the vascular spaces. In contradistinction to this definition, tumors that are made up of lymphatic vessels are designated as lymphangiomas. The oval group of veins beneath the mucous membrane at the back of the pharynx, known as Cruveilhier's sub-mucous venous plexus, has been found so greatly engorged and tumefied as to cause a sensation as if a foreign body were in the throat, and an annoying cough. The surface presents a hard, lobulated, and purple appearance. Varicose veins are not uncommonly met with in the pharynx, and they may become so numerous and distended as to form groups that are comparable to clusters of currants or blackberries. Hemorrhages may be expected from these growths, particularly following any irritation, such as a digital examination.

**Treatment.**—If angiomas attain to a considerable size they may cause much discomfort and apprehension on the part of the patient, and they may even so encroach upon the surrounding parts as to impair their functions. A constant desire to swallow, embarrassed respiration and deglutition are not the worst features to consider, but profuse hemorrhages may demand an operation in order to insure the safety of the patient. In such cases the tumor should be completely extirpated. It is rarely sufficiently pedunculated to admit of removal with the cold or the hot snare; hence electrolysis is the most feasible method. Should thyrotomy be resorted to, it may be necessary to perform a preparatory tracheotomy.

**SARCOMA.**—As a primary disease of the pharynx sarcoma is rarely seen. It springs from the submucous connective tissue, and generally depends from the inferior surface of the body of the sphenoid bone into the pharynx. It is an atypical proliferation of connective-tissue cells from a matrix of fibroblasts of congenital or postnatal origin. Owing to the rich supply of lymphatic structure in this locality and its invasion by the sarcomatous cells the tumor may show a transition into the variety termed lymphosarcoma.

Like fibroma, a sarcomatous growth produces symptoms referable to respiration, swallowing, and the voice in degrees commensurate with the location, size, and shape of the tumor. The nasopharyngeal secretions are increased in quantity, to which is added, after ulceration occurs, a viscid, foul, and bloody discharge. If pain is present, it is in proportion to the amount of pressure exerted on adjacent structures. Although the discharge, which appears after ulceration takes place, is of a sanguineous character, the history of the growth may not present hemorrhages to a serious extent. In order to make a positive differential diagnosis, resort should be had to the microscope. The prognosis is unfavorable; the progress is toward a fatal termination.

**Treatment.**—If all of the diseased tissue can be removed, this should be done, provided that metastasis has not occurred. It is useless to operate if a part of the growth be left, for rapid reproduction will occur; and if metastatic tumors have formed in other situations nothing will avail from operative procedures on the primary tumor. But if the growth can be enucleated from a circumscribing pseudo-capsule, leaving no remnant of diseased tissue, and if no metastasis has occurred to render nugatory the result of the operation, it should be performed. Otherwise there is little to be accomplished beyond making the conditions as tolerable as possible by the use of cleansing, disinfecting, and astringent applications.

Seth Scott Bishop.

**PHARYNX, DISEASES OF: NEUROSES.**—Neuroses of the pharynx consist of disturbances of sensibility, secretion, and motion.

**ANÆSTHESIA OF THE PHARYNX.**—This appears as a complete loss of the sensibility of the pharyngeal mucous membrane, or as a diminution of the same, and can be of either central or peripheral origin. When of central origin it is due to hemorrhage, tumors of the brain which cause compression of the vagus and glossopharyngeus nerves, inflammation of the brain, bulbar paralysis, tabes, or lateral sclerosis. It is seen in connection with epilepsy, after influenza, in anæmia and in hysteria, and is one of the sequelæ of severe general diseases, as pneumonia and especially diphtheria. Cocaine, eucaïne, morphine, chloral, bromide of potassium, carbolic acid, and menthol, when used locally and internally, bring about anæsthesia of the pharynx. The reflexes usually fail, and there is occasionally a feeling of general pain, even in the presence of local anæsthesia.

The diagnosis is made by direct examination. In the case of anæsthesia of one side only, one-half will have the natural sensibility, while the affected portion will be insensitive to mechanical, thermal, or chemical irritations. When the anæsthesia is complete, the mucous membrane is everywhere affected. When the result of diphtheria,

anæsthesia is often accompanied with paralysis of the muscles of the larynx and pharynx.

The prognosis depends entirely upon the cause, and is sometimes good and sometimes bad.

The treatment is based on the cause. Associated with diphtheria, the treatment is that of the general paralysis of diphtheria, and consists of measures to keep up the nutrition of the parts; careful feeding to prevent the introduction of particles of food into the larynx; the use of the constant and induced electrical current; and strychnine internally.

**HYPERÆSTHESIA OF THE PHARYNX.**—By this term is understood an increased sensibility due to central or peripheral irritations, whereby an extreme sensitiveness of the pharyngeal mucous membrane is brought about, which is described as pain, or is evident in the form of coughing, choking, retching, vomiting, and explosive belching of gases from the stomach.

Hyperæsthesia of the pharynx is a common manifestation, daily seen when an attempt is made at a laryngoscopic or rhinoscopic examination. It is often extreme, many persons retching, gagging, and almost vomiting whenever any instrument is brought near to the pharynx. Even the opening of the mouth and the drawing out of the tongue frequently elicits the strongest reflexes before the instrument has touched any part of the pharyngeal wall. It is common in persons apparently absolutely sound, but is more so in those who are very fat, in drinkers, smokers, and nervous persons. Local diseases, hyperæmia, acute or chronic catarrh, general hyperæsthesia, and increased general nervous sensibility intensify all the manifestations.

While it is a condition difficult to cure by any method of treatment, most persons after a while become used to manipulations in this region, and the treatment of the pathological condition present usually diminishes the sensibility.

Treatment consists in the local use of cocaine, menthol, chloral, bromide of potassium, various gargles, tannin, alum, and adrenalin, and in the avoidance of alcohol and tobacco.

**PARÆSTHESIA.**—Under this term are included various abnormal sensations, which are described as burning, pressure, itching, dryness, abrasions, lumps, or a sensation as of the presence of a foreign body in the pharynx. Among the foreign bodies complained of are pieces of bone, hairs, toothbrush bristles, needles, pieces of bread, cotton, portions of feathers—in fact, any substance that could possibly stick in the throat. Originally something may have lodged there, but as a rule it has been removed by retching or coughing before the physician was called. Hysterical and nervous persons of both sexes frequently complain of a lump in the throat (globus hystericus), of a burning pain, or of a feeling of icy coldness during the breathing.

Another one of the common forms of paræsthesia is the belief that there is a carcinoma in the throat, the circumvallate papillæ having been felt by the finger; and it is often extremely difficult to rid the mind of the individual of the idea that a new growth is present.

A feeling of extreme dryness, without material objective change, is frequent in mouth-breathers; in chlorosis, anæmia, and diabetes; and in users of morphine, atropine, or belladonna.

Paræsthesia is a more or less constant accompaniment of the chronic pharyngeal catarrhs. It is found in connection with tonsillar affections and with the various pathological changes of the nose and nasopharynx. Inflammations of the interarytenoid region, neuralgia of the superior laryngeal nerve, and affections of the central nervous system are also causative. It can occur as a reflex condition accompanying anæmia, chlorosis, hysteria, uterine and ovarian diseases, early phthisis, and hypochondriasis.

The diagnosis is dependent upon a careful examination of the entire pharynx, which must include an examination of the nasopharynx, tonsils and larynx as well, so that no possible source of irritation, direct or remote,

shall be overlooked. The patient will usually tell whenever a painful area is touched with the probe. Sometimes there are several of these points, which disappear upon painting the area with ten per cent. cocaine. The course is very chronic.

Treatment must depend entirely upon the cause. So far as anything local can be found, appropriate treatment is to be given; while for general nervousness and hysteria the treatment appropriate to this condition must be applied.

**SECRETORY NEUROSES.**—Hypersecretion of the pharynx is a condition which not infrequently occurs, especially in singers. Individuals with apparently completely normal mucous membranes complain of an increased secretion of slimy mucus in the pharynx, nasopharynx, or larynx, making it necessary to swallow very often, and to spit a great deal when talking, the swallowed secretion being frequently vomited early in the morning. Examination shows more or less of this mucus on the back of the pharyngeal wall and around the velum palati. This condition is sometimes observed in old people. Its cause seems to be some disturbance in the nervous control of the secretory glands.

Treatment is only partially successful. The condition sometimes disappears of itself, but is liable to return. Belladonna has been recommended. Small doses of iodide of potassium or the syrup of hydriodic acid frequently do good by increasing somewhat the secretion of the glands, so that the slimy mucus is less thick and therefore less complained of.

There is also a condition of nervous lessening of secretion, with a feeling of great dryness, seen in connection with hysteria or the use of morphine or belladonna, and found in sufferers from diabetes.

**NEUROSES OF MOBILITY.**—Cramp-like spasm of the constrictors occurs occasionally, most frequently in persons suffering from dyspepsia or some stomach affection; in general functional neurosis; occasionally in granular pharyngitis, hypertrophy of the side walls, and in connection with inflammatory processes at the base of the tongue. Cramp-like constriction of the muscles, interfering with swallowing, is found in connection with diseases of the brain, and is an accompaniment of tabes. It is most commonly seen as a tonic cramp in hysterical dysphagia. The muscles of the œsophagus are affected at the same time. In cramp of the muscles of swallowing, the passage downward of the mass of food is more or less interfered with. In hysterical dysphagia the swallowed mass is temporarily arrested at some point, usually with a sense of pressure and pain in the neck and around the sternum, then without further hindrance it passes into the stomach, or else with a feeling of suffocation, choking, and explosion of gases from the stomach it is vomited out. The swallowing of solid substances may be impossible for days or weeks.

Cramp of the muscles of the soft palate occurs comparatively seldom. When of a tonic nature the velum is in close contact with the posterior pharyngeal wall, resulting in an altered tone and impossibility of breathing through the nose. The cramp may be of a clonic nature, affecting only single muscles of the velum, as the levator or tensor or the azygos uvulæ. The causes are very various, consisting of true alterations in the nerve supply, central and peripheral irritations, and pathological processes in the immediate neighborhood.

The diagnosis of the various forms of cramp-like action of the muscles is not always easy, since hysterical dysphagia can simulate many affections. It can be differentiated from true paralysis of the muscles of the pharynx by its intermittence, as the phenomenon is not constant. The use of the sound, careful observation of the patient, and the study of all the possible causes will usually enable one to make a diagnosis.

Prognosis depends entirely upon the pathology, as does also the treatment.

**PARALYSES OF THE PHARYNX.**—These are mostly of central origin. Acute and chronic inflammation of the brain; tumors; hemorrhages which bring about compres-

sion of the vagus, accessorius, and glossopharyngeus nerves and their branches; as well as degenerative processes of the brain and medulla, such as bulbar paralysis, tabes, progressive muscular atrophy, and facial paralysis; lead intoxication; phthisis; grippe; pressure of carcinomatous glands upon the vagus and its branches—all these may have muscular disturbances of the pharynx as their sequelæ. Of the peripheral causes diphtheria and scarlet fever are the most frequent. Syphilis and general neuritis are also causative.

Paralyses of sensation and of motion often occur together. Paralysis of the soft palate is the most frequent, and may be one-sided or double-sided, complete or incomplete. When it is one-sided, the palate is drawn sometimes toward the sound and sometimes toward the diseased side. The arch of the paralyzed side is deeper, while on the sound side the arch is higher and narrower. During phonation the velum comes toward the sound side. When the uvula alone is paralyzed, which is a frequent condition in pharynx or larynx catarrh and in paralysis of the vocal cords, it goes toward the sound side. In double paralysis of the velum, it hangs with the uvula straight down and shows no sign of active movement except in respiration, when the uvula moves slightly backward and forward; during phonation there is a slight attempt for it to reach the posterior wall. The voice has a very nasal tone. There is seldom difficulty in swallowing.

Paralysis of the constrictors of the pharynx, with or without accompanying paralysis of the velum and of the œsophagus, is most frequent in connection with diphtheria, scarlet fever, and the other infectious diseases and in bulbar paralysis. When the paralysis is limited to the constrictors, particles of food lodge at the base of the tongue and in the adjacent sinuses, and fluids pass easily into the larynx, producing intense cough and suffocation. If the superior constrictor alone is paralyzed, the particles of food may be thrown into the nose.

The diagnosis of paralysis of the muscles of the pharynx is very easy, but the condition is often overlooked, especially when the paralysis is incomplete. The incomplete paralysis often suggests adenoid vegetations or polypi in the nose. When brought about through inflammatory or mechanical causes there are redness, swelling, œdema, ulcers, and cicatrices. The cause of the paralysis is often difficult to find.

In central paralysis the electro-motor excitability is normal and can remain so. In complete peripheral paralysis the electro-motor excitability very rapidly diminishes and can be lost by the third week.

Hysterical paralysis begins suddenly, disappears suddenly, and comes again without apparent cause.

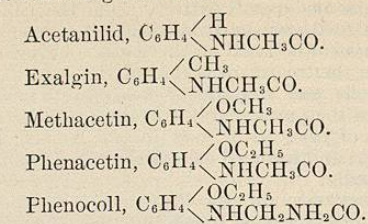
The prognosis and the treatment must depend entirely upon the cause. Prognosis is not good when the condition is of central origin, but good when of diphtheritic, rheumatic, infectious, or of local inflammatory origin.

Electricity is the best remedy. The faradic current can be used to advantage, although the galvanic current is preferable. When the paralysis has lasted any length of time both are indicated, as the faradic current helps maintain the nutrition of the muscle while the galvanic directly stimulates the nerve. When electricity is used one electrode should be placed on the cervical vertebrae or the anterior surface of the neck, the other on the pharyngeal wall against the paralyzed muscle. The pharyngeal electrode should be one in which the current can be turned off and on. Strychnine internally, and remedies which promote the general nutrition both of the local part and of the general constitution are to be used in addition to the electricity.

George L. Richards.

**PHENACETIN.**—(*Para-acet-phenetidin*.) This well-known and popular derivative of coal tar was introduced in 1887 by Dr. O. Hinsberg and Prof. A. Kast.<sup>1</sup> Its chemical formula is  $C_8H_9O_2N$ . In the last revision of the British Pharmacopœia it was recognized as an official drug. The chemical relation of phenacetin

to allied compounds will be readily understood by reference to the following formulæ:



Phenazone, or antipyrin, which is therapeutically allied to the above, is related only so far as all are derived from phenyl compounds; its formula is



Phenacetin forms in white, glistening, scaly crystals, without odor or taste. It is slightly soluble in cold water, 1 part in 1,500; more soluble in hot water, 1 part in 70; and freely soluble in rectified spirits, 1 part in 16; it is also soluble in glycerin. The crystals melt at 275° F. A recognized test for phenacetin is the production of a deep red color when chromic acid is added to a cooled and filtered solution of one grain in twenty minims of hydrochloric acid diluted with ten times its volume of water. Sulphuric acid should dissolve it without color, and burned with free access of air it should leave no residue. The presence of parphenetidin may be detected by melting forty grains of chloral hydrate in a water-bath, and adding eight grains of phenacetin and well shaking; a solution takes place which is colored violet, reddish, or bluish in tint, according to the proportion of the impurity present. Another test, though less delicate, is to add eight grains of phenacetin to one and a half drachms of iodine solution, 1 to 20,000; when filtered a pure salt yields a colorless liquid; a pink tint indicates the presence of parphenetidin. Phenacetin does not form a bromine compound as acetanilid does, and this reaction furnishes a test for the presence of the latter salt; the addition of bromine water to a saturated solution of the suspected salt, imparts a yellow color; if acetanilid is present the solution becomes turbid, if it is absent it remains clear. The presence of acetanilid, exalgin, or methacetin may be detected by adding two grains to twenty minims of concentrated hydrochloric acid; phenacetin remains undissolved, the other salts enter into solution.

Phenacetin was introduced as an analgesic and antipyretic much superior to the other similar compounds, on account of its freedom from any toxic action. It rapidly established a reputation as one of the most safe of the numerous new antipyretics, and has been very extensively employed in all febrile diseases, and for the relief of pain in all its forms. Its action is not accompanied by the numerous unfavorable symptoms that are common to the coal-tar derivatives. The most frequent undesirable effect that may be caused by its use is the onset of sweating, more or less profuse. Although its composition is such that it may cause the alterations of the blood that are produced by exalgin, acetanilid, etc., the instances in which any such condition follows its use are extremely rare. Some cases, however, are reported in which there were paleness and coldness of the extremities, free perspiration, precordial pain, dyspnoea, shallow respiration, feeble pulse, cyanosis, and other evidences of collapse. Many of these cases of poisoning occurred in females, and generally followed the employment of large doses; but in one case only three doses of seven grains each were given. The presence of impurities, especially parphenetidin, is undoubtedly the cause of many of the unfavorable symptoms. Very large doses have been given without any ill effects. A case is reported in which sixty grains were given daily for two weeks, as an anodyne; in another case one ounce and one drachm were given during one week to a patient with neuritis, and in

a case of tetanus one ounce and five drachms were given in nineteen days. During experimental research upon animals, it has been given for a prolonged period in doses equal to one and two-thirds grain per pound of body weight without producing any derangement of the system, or causing any irritation to the mucous membrane of the stomach.

A series of experiments on animals by Drs. Cerna and Carter<sup>2</sup> have led them to the following conclusions: (1) Phenacetin in moderate doses causes a rise of the arterial pressure by acting upon the heart, and probably likewise by exerting a stimulating influence on the vaso-motor system. (2) In large amounts it causes a reduction in the pressure, which is largely of cardiac origin. (3) In small doses it increases the force of the heart by a direct action. (4) It increases the pulse rate chiefly by cardiac stimulation, and possibly also by influencing the cardio-accelerating apparatus. (5) In large quantities the drug reduces the number of pulsations, primarily by stimulating the cardio-inhibitory centres, and later by a depressant action on the heart. They also found that in large amounts it caused a marked quickening of the respiratory movements by a direct action on the medulla, and that where sufficient quantities were given to produce death it was due to respiratory failure. (See also *Phenocoll*.)

As an antipyretic it is given in doses of from five to ten grains, every hour or every two hours. It reduces the temperature slowly and effectively; during the first and second hours there is not much influence on the fever, but in the third hour its greatest effect is manifested. The continuation of the afebrile state varies, but usually after the fourth or fifth hour the temperature begins to ascend. The fall of the temperature results chiefly from a decrease in heat production, with a slight increase in the heat dissipation. The slow action of the drug is thought to depend on its insolubility. In chronic febrile troubles its action is not so marked, and a tolerance of the drug appears to ensue upon its prolonged administration. When there are pain, restlessness, and insomnia accompanying the fever, the beneficial effects of the drug are most marked. A sense of ease and comfort is produced, and a calm, refreshing sleep follows. By some it has been supposed to exert a decided hypnotic action, but careful observations in melancholia and mania have not confirmed this view. In typhoid fever it has proved of great service. From five to eight grains are generally sufficient to reduce the temperature to normal in about three hours; when it begins to rise again a second dose will prevent any hyperpyrexia for twenty-four hours. Many prefer to employ it in smaller doses frequently repeated—two grains every two or three hours and continued throughout the period of pyrexia; in this way it maintains the temperature at a low point and the fever runs a mild and uncomplicated course. In children it proves beneficial in all febrile disorders; single doses of two grains will produce a lowering of temperature, or it may be given in fractional parts of a grain every two or three hours; one-third of a grain having proved sufficient to subdue the fever and allay restlessness. For "la grippe" it has proved very serviceable, and has replaced the older antipyretics to a very great extent. In this disease the small and frequently repeated doses were of little avail, a single dose of ten or fifteen grains being generally sufficient to relieve the fever and the severe cephalalgia with which it was usually accompanied. One of its earliest applications was as an anti-rheumatic. It has no influence in warding off the cardiac and other visceral complications, but it reduces the fever and lessens the pain and swelling in the joints; to be of any benefit it must be employed in much larger doses than in any other febrile affection. At least fifteen or twenty grains must be given three times daily, and some state that a better effect is produced by thirty grains given twice in the day. In children five grains three or four times a day may be required. In painful affections unaccompanied by fever, and in the various forms of neuralgia, it requires to be given in the same full doses to secure a relief from suffering. A single

dose of from fifteen to twenty grains will prove sufficient when any benefit is to be derived, while small and frequent doses exercise very little, if any, action in controlling the pain. Phenacetin has also acquired a reputation as a remedy for whooping-cough. It is given in doses of from half a grain up to two grains every four hours, and affords rapid relief to the severe paroxysms. It is also supposed to shorten the duration of the disease.

Compared with the allied drugs, phenacetin may be said to be more pleasant and safe, but less powerful and slower in its action; and perhaps less certain, as it frequently fails to produce the desired effect.

*Iodophenacetin* or *iodophenin* is a compound of iodine and phenacetin introduced by Dr. Scholvin, at a meeting of the Berlin Pharmaceutical Society, 1891. It contains fifty per cent. of iodine, and forms in steel-blue crystals, with an odor of iodine and a burning taste. Water decomposes the salt, liberating the iodine in a free state. It possesses the active germicidal and antiseptic properties of iodine, and owing to the looseness of its combination it was suggested as an intestinal antiseptic. The local irritation proved a source of discomfort, and toxic symptoms frequently followed its employment. It is now seldom employed. *Beaumont Small.*

<sup>1</sup> Centralt. f. gesam. Therap., April, 1887.  
<sup>2</sup> Therapeutic Gazette, March, 1893.

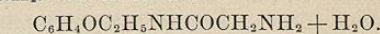
**PHENACETIN, POISONING BY.** See *Synthetic Poisons, Organic*.

**PHENALGIN**—ammonio-phenylacetamid—is a fine white powder of ammoniacal odor and slightly alkaline taste. With water it makes an alkaline solution. It is a proprietary remedy of uncertain composition, stated to be an efficient analgesic, antipyretic, and antiperiodic. The ammonia present is intended to prevent depression of heart and respiration. Dose 0.3–1.3 gm. (gr. v.–xx.). *W. A. Bastedo.*

**PHENAZONE.** See *Antipyrin*.

**PHENEGOL.** See *Egols*.

**PHENOCOLL.**—(Amido-acet-para-phenetidin.) During the past few years our knowledge of the chemistry of modern antipyretics has so far advanced that new synthetic remedies are produced, the therapeutic properties of which have been carefully considered beforehand. Such a one has been prepared by German manufacturers and introduced under the name of phenocoll. It is said to be an antipyretic, possessed of all the favorable qualities of phenacetin, and devoid of any of its undesirable effects. It is obtained by replacing in phenacetin one hydrogen atom of the acetyl group by the amido group  $NH_2$ . Its formula is



Phenocoll, the base, forms in white acicular crystals which have a tendency to mat themselves together. It is readily soluble in alcohol and warm water, but only slightly in chloroform, ether, and cold water. Dilute caustic alkalis, or dilute acids when cold, have no power to split up the compound, but by prolonged boiling it is resolved into its constituents. The most important characteristic of this compound is its power of combining with acids and forming soluble salts.

The hydrochloride of phenocoll is the salt generally employed, but salts have also been formed with other acids. The salicylate occurs in long needles; it has a sweetish and not disagreeable taste, and is supposed to add some of the therapeutic properties of salicylic acid to phenocoll. It has been introduced to the profession under the name *salocoll*.

*Phenocoll hydrochloride* is a white, minutely crystalline powder, with a bitter, saline, but not disagreeable taste. It is soluble in cold water, about one part in sixteen, forming a neutral, stable solution. It is still more soluble in hot water and in alcohol.

The superiority claimed for it over other antipyretics was based not only on its greater solubility and more rapid action, but also on its perfect harmlessness. The result of experiments by Dr. Isaac Ott, however, shows that in very large quantities it produces the same effects as phenacetin and similar compounds. He reports: (1) that upon frogs it produces a general paralysis, due to an action upon the cerebrospinal axis; (2) upon rabbits it produces a cyanotic condition of the ears, and reduces the force and frequency of the heart; (3) it kills through an action upon the centre of respiration.

The investigations and clinical reports upon the action of this new remedy have been chiefly made in Germany and Italy, but Drs. Cerna and Carter, of Philadelphia, have done some very thorough experimental work, to determine the comparative action of antipyrin, phenacetin, and phenocoll. The following are their conclusions regarding its action on the heart and circulation:

1. Phenocoll, in ordinary amounts, has practically no effect upon the circulation.

2. Large doses diminish the blood pressure by influencing the heart.

3. Phenocoll reduces the pulse rate by stimulating the cardio-inhibitory centres. It then increases the rapidity of the pulse by paralyzing said centres. The final diminution is of cardiac origin.

4. Upon the blood itself phenocoll has no action. As to the relative action of the three antipyretics that were experimented with, they sum all as follows:

1. Antipyrin, phenacetin, and phenocoll all fail to produce any effect on the heat functions of the normal animal.

2. Antipyrin produces a decided fall of temperature in the first hour after its administration in the fevered animal. This reduction is due to a great increase in heat dissipation, together with a fall in the heat production.

3. Phenacetin, both in septic and in albumose fevers, produces a very slight fall of temperature during the first and second hours after its ingestion by the stomach, but the greatest reduction occurs during the third hour after its ingestion. The fall of temperature results chiefly from a decrease in heat production, with a slight increase in the heat dissipation. The increase in dissipation is not as great as with antipyrin. Probably the delayed action of the drug depends on its insolubility.

4. Phenocoll causes in fever a very decided fall in temperature, which occurs during the first hour after the administration of the drug by the stomach. This reduction is the result of an enormous diminution of heat production, without any alteration of heat dissipation.

Phenocoll has been recommended as an antipyretic, analgesic, antirheumatic, and antiperiodic, but has not proved itself of particular value. Its action resembles that of phenacetin, but phenocoll requires to be given in larger doses. In some instances ill effects have followed its employment. Excessive sweating, dyspnea, marked depression, rashes, darkened urine, and many other unfavorable symptoms have been reported.

Beaumont Small.

**PHENOL-BISMUTH**— $C_6H_5O.Bi(OH)_3$ —is a practically odorless and tasteless, white, non-irritant, and non-toxic powder, containing nineteen per cent. of phenol. Like other bismuth preparations, it is used as a mechanical sedative and antiseptic to the gastro-intestinal tract, but in addition, as shown by the urine, sets free some of its phenol. No poisonous effects have been noticed (Jasenski) from taking 5 gm. (gr. lxxv.) a day for three weeks. R. W. Wilcox says that it is superior to all other forms of bismuth in fermentative dyspepsias and in chronic gastritis marked by pyrosis, or boulimia. The dose is 1-5 gm. (gr. xv.-lxxv.) daily. W. A. Bastedo.

**PHENOLPHTHALEIN**— $C_{20}H_{14}.CO.C(C_6H_5OH)_2.O$ —is prepared by digesting ten parts of phenol, five parts phthalic anhydride, and four parts concentrated sulphuric acid for several hours, boiling the residue with water to remove soluble matter, and then boiling the remaining

resinous substance in benzol. Phenolphthalein is a yellowish-brown powder, which, in 1 to 30 alcoholic solution, serves as an acid-alkali indicator in volumetric analysis. Colorless in acid solutions, it turns a brilliant pink on neutralization with an alkali. It is not, however, a safe indicator for the carbonated alkalies.

At the British Medical Association, 1902, Tunncliffe reported over one thousand cases of its use as a cathartic. It may safely be employed in renal disease as it is excreted by the intestines and not by the kidneys. The dose is 0.15-1 gm. (gr. iiss.-xv.) in tablets, 0.3 gm. (gr. v.) being usually sufficient to purge an adult.

W. A. Bastedo.

**PHENOL, POISONING BY.**—This substance, now a very familiar antiseptic, is known more generally as carbolic or phenic acid, also as coal-tar creosote. True creosote, the characteristic ingredient of wood-tar, especially that from beech-wood, is not identical with phenol.

Phenol, as the common name indicates, has some acid properties, but is, more strictly speaking, an alcohol. Its formula is  $C_6H_5HO$ . When pure it is a colorless, crystalline, deliquescent mass, soluble in water, alcohol, and glycerin, with a well-marked odor, and a burning taste. The crude carbolic acid of commerce is variable in composition, and often consists of little else than neutral tar oils, which are destitute of any antiseptic qualities.

Applied to the skin, phenol produces a white superficial eschar; on the mucous surface the effect is more severe. A number of cases are recorded in which death has resulted from external application, even to a limited surface. The introduction, at a comparatively recent date, of phenol in antiseptic surgery has been responsible for several fatal cases.

When phenol is swallowed in moderate concentration an intense burning sensation is immediately experienced in the throat, œsophagus, and stomach, the mucous membrane becoming white and hardened. Vomiting of a frothy mucus occurs. The skin becomes cold, the lips and ears livid, pupils contracted and insensitive, and breathing difficult; the pulse may be 120 and irregular. The urine becomes dark-colored, and may be suppressed. These symptoms are soon followed by insensibility, with stertorous breathing. The appearances after death are largely those of local action of the poison, but the train of symptoms shows that, as in the case of nearly all other poisons, there is a distinct action on the nervous system to which the fatal result is largely due.

The fatal quantity is somewhat difficult to fix, owing to the great variation in strength of the commercial solutions, in which form the acid is generally encountered in cases of poisoning. In one case noted by Taylor a woman died in about half an hour after swallowing a wineglassful of, probably, a weak aqueous solution of phenol. The minimum fatal dose is given by some authorities as one drachm, but recovery from such an amount is possible. Half an ounce is almost invariably fatal. Fatal results have several times occurred rather rapidly, that is, in less than an hour.

The best antidote is alcohol—the strong commercial spirit for external application, common whiskey, or the commercial spirit diluted considerably, for internal use. The alcohol not only stops the action of the poison, but if the damage be not very great, it restores the condition of the tissues. Other chemical antidotes that have been advised are magnesium sulphate, sodium sulphate (these are supposed to form less active sulphonates), syrup of lime, and even vinegar. The manner in which the last-named acts is not explained, but it has been strongly recommended by some persons. After the severe symptoms have abated, the stomach should be washed out with tepid water. It is not advisable to attempt to produce vomiting either by emetics or by hypodermic use of apomorphine. Henry Leffmann.

**PHENOL-SODIUM SULFORICINATE** is a yellowish liquid soluble in water and alcohol, and recommended by Von Tovolgyi for tuberculous laryngitis. Used like lac-

tic acid without preparatory anæsthetization of the throat, it reduces the tuberculous infiltration and favorably influences the dysphagia. It has also been used for diphtheritic throats and in skin diseases. W. A. Bastedo.

**PHENOLURIA.** See *Urine, etc.*

**PHENOSAL**— $C_6H_4.OC_2H_5.NH.CO.CH_2.O.C_6H_4.COOH$ —is the aceto-salicylate of phenetidin, and occurs in sparingly soluble needles or plates of acidulous taste. In the alimentary tract it breaks up, yielding fifty-seven per cent. of phenetidin and thirty-four per cent. of salicylic acid. It is antipyretic, and is especially recommended in rheumatism. The dose is 0.3-0.7 gm. (gr. v.-x.) three or four times a day. W. A. Bastedo.

**PHENOSALYL.**—This compound antiseptic is the result of a series of experiments upon various antiseptics by Dr. de Christmas, in the Pasteur Institute, Paris. He has shown that when certain antiseptics are associated together in one and the same solution, the microbicide power is greater than that of the sum of the solutions of each acting separately. The preparation to which he has given the name phenosalyl is considered by him to be a most efficient antiseptic, its action on the various bacteria being exceeded only by sublimate. It has the following composition: Carbolic acid, 90 parts; salicylic acid, 10 parts; lactic acid, 20 parts; menthol, 1 part.

The three acids are heated up to the point of liquefaction, when the menthol is added. It is very soluble in glycerin, and in water to the extent of four per cent.

Beaumont Small.

**PHENOSUCCIN**—pyrantin, para-ethoxy-phenyl succinimide,  $C_6H_4.OC_2H_5.N(COCH_2)_2$ —obtained by the action of succinic acid on para-amido-phenol, occurs in colorless needles which are insoluble in water and ether, but soluble in alcohol and acetic acid. It is antipyretic and antineuralgic in dose of 1-3 gm. (gr. xv.-xlv.) daily, clinical experience showing that it has no depressing effect except in large quantities. The sodium salt forms a sweetish solution with water. W. A. Bastedo.

**PHENYL-ACETIC ACID**—alpha-toluic acid,  $C_6H_5.CH_2.COOH$ —is obtained by boiling benzyl cyanide with potassium hydroxide solution. It occurs in white glassy scales of burning aromatic taste and soluble in hot water and alcohol. It is given in dose of 0.06-0.15 gm. (gr. i.-iiss.) with cod-liver oil for tuberculosis of the lungs. W. A. Bastedo.

**PHENYLHYDRAZINE**— $C_6H_5.NH.NH_2$ —a colorless oily liquid which solidifies into tabular crystals. It is slightly soluble in water. An hydrochloride forms in colorless scales which are readily soluble in water. Phenylhydrazine is an intermediary product in the preparation of many antipyretics, notably antipyrin and hydracetine, but its toxic action is too marked to allow of its employment as a therapeutic agent. *Phenylhydrazine levulinic acid*, under the registered title of *antithermin*, was employed as an antipyretic in doses of five grains. It is now but little used, as its action is uncertain, and is not so safe as that of antipyrin and other similar preparations.

Phenylhydrazine is best known as a test for the presence of sugar in urine, and is known as Fischer's test. It was discovered by Prof. Emil Fischer, and depends upon the property of the sugar forming, in the presence of phenylhydrazine, crystals of phenylglucosazone. Beaumont Small.

**PHENYL-SALICYLIC ACID**—ortho-oxy-diphenyl-carboxylic acid,  $C_6H_5.OH.C_6H_4.COOH$ —is a white powder, slightly soluble in water and more so in alcohol and glycerin, and is employed as an antiseptic dusting powder. W. A. Bastedo.

**PHILADELPHIA, PA.**—Philadelphia, founded by William Penn, was the first capital of the United States. The population was estimated January 1st, 1903, at

Vol. VI.—39

1,347,712. The city, situated at the confluence of the Delaware and Schuylkill Rivers, in latitude 30° 57' north, is nearly on a line with Madrid and Lisbon, and is about sixty miles from the sea in a direct line. The intervening portion of the State of New Jersey is almost a level plain, abounding in pine, oak, and other timber of second growth. To the westward the land rises gradually and the nearest mountain ridges are from fifty to one hundred miles distant. The highest elevation within the limits of Philadelphia is 450 feet. The mean annual temperature is 53° F., with extremes of -6° F. (1889) to 103° F. (1901). The extremes in 1902 were 12° F., February 5th, and 95° F. July 9th. Precipitation, 49.76 inches. Days with precipitation of 0.01 inch or more, 128. Snowfall, 32.2 inches, distributed as follows: January, 7.7 inches; February, 14.3 inches; March, 4.2 inches; December, 6 inches.

Clear days, 181; partly cloudy, 103; cloudy, 131. Thunderstorms, February, 1; March, 3; April, 1; May, 3; June, 8; July, 13; August, 9; November, 1; total, 39.

The prevailing direction of the wind was northwest and the maximum velocity was 52 miles an hour, from the north, on December 5th. While the mean temperature for the year is about 5.7° F. higher than at London, the mean for January is 3° F. lower, and for July 15° F. higher. The relative humidity at 8 A.M. and 8 P.M. is 75 per cent. and 68 per cent. The rainfall averages 43 inches, considerably greater than that of London (24.84 inches). London, however, exceeds Philadelphia, as well as New York, Boston, Chicago, and all the principal cities of the United States in the number of rainy days. There are about 129 clear days each year in Philadelphia, which is less than at Baltimore (141), at Denver (150), or at Phoenix, Arizona (259). The spring opens in Philadelphia two or three weeks earlier than at Boston, and autumn lasts longer. Roses may bloom through November. The winters are not generally severe. Comparatively little snow falls, yet there may be days or weeks of temperature below the freezing point. Philadelphia has 36 parks, the largest, Fairmount Park, containing over 3,300 acres, through which flows the Schuylkill River, spanned by four bridges. Within the limits of the park the river reaches a width of about one-fourth of a mile. At the northernmost boundary of the East Park the romantic Wissahickon stream empties into the Schuylkill, and the beautiful paths along its borders are favorite resorts for driving, riding, cycling, and walking, while the well-wooded hills that rise just beyond are attractive places for picnics. There is excellent boating on the Schuylkill and on the Wissahickon. Throughout the park at convenient places are houses of rest, restaurants, dairies, and playgrounds. The natural beauties of the grounds are preserved as far as possible. At the southwestern border of the park is the extensive Zoological Garden.

Fairmount Park is of inestimable value to the citizens of Philadelphia, and doubtless exerts a controlling influence on the death rate, particularly among children.

The general death rate of Philadelphia in 1902 was 17.67 per 1,000 population. It was lower than that of New York City (18.74), and reflects credit on the energetic measures adopted by the Bureau of Health. Careful and minute attention is paid to disinfection after contagious disease has been reported. Vaccination has been vigorously carried out. During the past year (1902) the deaths from smallpox numbered 231; from scarlet fever, 143; from diphtheria, 435; from diseases of the heart, 1681; from pulmonary tuberculosis, 2845, and from pneumonia, 2976. The deaths from consumption have recently fallen to second place, owing to a wider knowledge of the principles governing the spread of the disease and to the distribution of pamphlets showing how the disease may be prevented. The Pennsylvania Society for the Prevention of Tuberculosis has assisted in this way to limit the spread of the disease.

Great good will accrue from the recent gift of \$1,000,000 by Mr. Henry Phipps for a systematic effort in Philadelphia to eradicate tuberculosis by the establishment of