with alcohol, the filtered alcoholic solution evaporated, and the residue redissolved in a small quantity of water. The solution so obtained (No. 1) will contain any free oxalic acid which may have been present. The material left undissolved by alcohol in the preparation of solution No. 1 is next to be extracted with alcohol, acidulated with hydrochloric acid, the solution filtered and evaporated, and the residue redissolved in a small quantity of water. This solution (No. 2) will contain any oxalic acid which may have been present in the form of a *soluble* oxalate. Lastly, the substance left undissolved by water in the preparation of solution No. 1 is to be treated with a sufficient amount of solution of potassium carbonate (not hydroxid) to render it distinctly alkaline, and boiled for two hours. The solution is filtered and evaporated, the residue extracted with alcohol acidulated with hydrochloric acid, the solution filtered and evaporated, and the residue redissolved in water. This solution (No. 3) will contain oxalic acid, if it were present in the form of an *insoluble* oxalate.

The tests for oxalic acid are then to be applied to the three solutions.

The urine, contents of stomach, and vomited matters should also be examined microscopically for crystals of calcium oxalate.

The detection of a *mere trace* of oxalic acid can only be of value as corroborative evidence in a case of suspected poisoning by that substance, owing to the normal presence of oxalates in articles of food and in the human economy.

Tests.—1. A solution of a calcium salt produces, in neutral or alkaline solutions, a white precipitate which redissolves in hydrochloric acid.

2. Argentic nitrate solution produces a white precipitate which dissolves in ammonium hydroxid solution and also in nitric acid. If the liquid containing the precipitate be boiled, the latter does not darken. If the precipitate be collected, dried, and heated upon a strip of platinum foil, it explodes.

3. Lead acetate solution, in solutions of oxalates which are not too dilute, produces a white precipitate which is soluble in nitric acid, but insoluble in acetic acid.

Rudolph A. Witthaus.

OXAPHOR. See *Oxycamphor*.

OXFORD MINERAL SPRING.—New Haven County, Connecticut. Post-Office.—Oxford.

Good hotel within one-half mile. This spring has been well known to residents of the neighborhood for many years, but it has only recently been brought to the attention of the public. Its medicinal properties are supposed to have been known to the Indians, as arrow heads and other evidences of aboriginal life are frequently found near it. The spring yields about one and a half gallons of pure, sparkling water per minute. An analysis by Prof. George F. Barker, of the Sheffield Scientific School, in 1873, resulted as follows: One United States gallon contains: Sodium chloride, gr. 0.35; sodium sulphate, gr. 0.49; potassium sulphate, a trace; lithium sulphate, a trace; magnesium sulphate, gr. 0.62; calcium sulphate, gr. 1.61; iron carbonate, gr. 0.91; silica and insoluble matter, gr. 1.33; organic matter, gr. 1.22; loss in analysis, gr. 0.10. Total, 6.18 grains.

The path of the stream can be easily traced by the abundant bright yellow deposit of hydrate of iron. In the short time since this water was brought before the public it has risen high in popular favor as an invigorant and general tonic. It is useful in conditions of debility and anæmia, and in stomach, liver, and renal disorders, etc. The water is used commercially, and is said to be acquiring an extensive sale. *James K. Crook.*

OXYCAMPHOR—($C_8H_{14}CO.CHOH$), a product of the oxidation of camphor—is prepared by reducing camphor orthoquinone with zinc powder and acetic, sulphuric, or hydrochloric acid. It is a white crystalline powder of bitterish, peppery taste, and without odor. It fuses at 204° C. (400° F.), and is soluble in fifty parts of cold water and freely in hot water, alcohol, ether, chloroform, and the oils. Its two-per-cent. solution coagulates albumin, reduces hæmoglobin, and is strongly bactericidal.

To this drug is attributed the special power to overcome dyspnœa by diminishing the excitability of the respiratory centre in the medulla. Physiological experiments with 0.5-per-cent. solutions and clinical usage by Ruttner, Ehrlich, Marlier, and others have demonstrated that oxycamphor tends to lessen the frequency of the respirations, to increase their depth, to slow the pulse, and slightly to increase the blood pressure. It improved the breathing in cases of tuberculosis, bronchitis, emphysema, Bright's disease, anæmia, and heart disease.

Exposed to light and moisture the powder becomes a soft, slimy, sticky, yellowish mass. It keeps fairly well, however, in tablet triturates made with sugar of milk, and is stable in fifty-per-cent. alcoholic solution. This solution, known as *oxaphor*, is given with much water in dose of 0.5–1.0 c.c. (♏viij.–xv.). *W. A. Bastedo.*

OXYGEN.—Oxygen is not recognized in the United States Pharmacopœia as a drug, but yet is used in medicine to a certain extent, generally by inhalation, either of the pure gas, or of the same mingled with from one to four volumes of atmospheric air or of nitrogen monoxide (nitrous oxide gas). Oxygen is a colorless, odorless, and tasteless gas, and is, when pure, distinctly irritant to sensitive parts. Its main medical interest centres upon the phenomena which follow the inhalation of the gas in greater concentration than is the case in the atmosphere. Continuously inhaled, pure, the irritant effects of oxygen are considerable; mice immersed in an atmosphere of pure oxygen die after three days with congested and inflamed lungs. With inhalations too short to excite local mischief, the question naturally arises whether an atmosphere abnormally rich in oxygen does or does not tend to determine abnormal absorption of the gas into the blood, and so a quickening of the oxidations concerned in vital processes. Opposite opinions have been held on this question. The one view (Regnault and others) is that with healthy lungs the blood normally takes from the ordinary atmosphere all the oxygen that it is physiologically capable of absorbing, so that the presentment to it of an air containing an increased proportion of the gas can have no effect on the absorption rate. But a considerable number of experiments and observations of various kinds seem to oppose this view, and lead to the belief that crowding the lungs with oxygen does also crowd the blood with the gas. Thus, during oxygen inhalations granulation tissue has been observed to grow quickly ruddier in hue (Demarquay), expired carbon dioxide to double in amount (Allen and Pepys, Limousin), and excreted uric acid to lessen in quantity, presumably by undergoing oxidation within the system (Kollman). Whichever answer to the question be the true one, no marked symptom pointing to any serious derangement of physiological processes occurs when a moderate inhalation is practised by one in health. The gas, even when pure, is pleasantly respirable, and from fifteen to thirty litres (from four to eight gallons, about) can be inhaled with little other obvious effect than a feeling of general warmth and nervous exhilaration, with occasionally a little giddiness and quickening of the pulse rate. But while the effects in health are comparatively negative, it is far otherwise when an oxygen inhalation is undertaken by one suffering for want of a sufficiency of oxygen because of some impediment to the full exercise of the respiratory function, such as may be caused by asthma, emphysema, cardiac disease, croup, diphtheria, etc. In such case the distress, because of the insufficiency of the air supply, tends to be compensated by the higher oxygenation of the same, and the dyspnœa may be greatly abated, or even, for the time, wholly abrogated. And the relief may persist, of course in keeping with the character of the case, for a longer or shorter time after discontinuance of the inhalation. Similar relief by respiration of oxygen is afforded in cases of asphyxia from irrespirable or noxious gases, such as carbon monoxide or the poisoned air of sewers.

The therapeutic applications of oxygen are, first in importance, the administration of the gas by inhalation for the relief of dyspnœa or asphyxia in the circumstances above described. Inhalations have also been practised with the view of quickening the processes of physiological chemistry and so determining better nutrition in chronic cachectic states, such as anæmia, chlorosis, tuberculosis, etc. The results of this latter therapeusis, however, have not been very striking. Under any circumstances the existence of ulceration or active inflammation within the air passages had better be accepted as contraindicating oxygen inhalation, unless the gas be well diluted. In appropriate cases, from four to sixteen litres (one to four gallons, about) may be inhaled at a sitting, two or three times a day, pure or diluted with air, from one to four volumes, according to the urgency of the case. The gas must be known to be pure, in the chemical sense of the word, and is best administered by means of the bags devised for the giving of nitrous oxide gas. But whether the gas be drawn from a bag or from a gasometer, the inhalation should be by means of a mouthpiece so fitted with valves that the products of expiration shall not pass into the apparatus to mingle with the gases to be respired. In order to obtain dilution with air the simplest expedient is to leave the nostrils open to inhale the atmosphere, while the mouth inhales oxygen.

Oxygen has been administered also by passing the gas into the stomach or the rectum, and with reported prompt relief of dyspnœa, the same as when given by inhalation. Four rectal injections of five litres each are said to have been absorbed in an hour. Oxygen has also been used locally for the vivifying of tissues disposed to ulceration or gangrene, with reported benefit. The practice is certainly not a common one in the United States. The gas is applied in jet upon the affected parts.

Oxygen is supplied for medical use in iron cylinders, generally condensed so that a cylinder holding from one hundred to two hundred gallons is of a size easily handled and stored. From such reservoirs a bag or gasometer is charged for the individual inhalations. Where these cylinders are not procurable, oxygen may be obtained by the usual procedure of heating potassium chlorate with admixture of a little manganese dioxide—this addition in some way determining the decomposition of the chlorate at a lower temperature than would otherwise be required. The manganese compound must be free from adulteration with carbon (such as occurs in some commercial samples by the accidental or intentional addition of pounded coal), else a dangerous explosion may result. It is best, therefore, to test an untried sample by heating a little of it with a little potassium chlorate in a test tube, where the small scale of a possible explosion will do no serious mischief. For the making, the mixed substances are heated in a closed retort or flask, from which a tube leads through an intervening wash bottle, containing caustic soda solution, to a gasometer or jar filled with water and inverted in a pneumatic trough, or to the bag from which the inhalations are made. The first portions of gas that come over should be allowed to escape before connection is made with the wash bottle. And this wash bottle is an all-important feature of the apparatus, the passage of the oxygen through soda being necessary to free the gas from contamination with carbon dioxide and chlorine. The connecting tube of the apparatus should be of good size, since the gas, when once it begins to disengage, comes over in great volume. For the same reason the heat should carefully be watched and regulated during the operation, to avoid too furious action. For each litre (about one quart) of oxygen required, 3.46 gm. (about gr. liiiss.) of potassium chlorate will be needed. The salt must be well powdered, and mixed with one-eighth of its weight, or thereabouts, of powdered and pure black oxide of manganese. *Edward Curtis.*

OXYQUINASEPTOL.—(Diaphtherin—$C_6H_4[HOC_9H_6NHO]_2SO_2$)—a registered compound introduced as a powerful antiseptic for surgical purposes, but which has not been much employed. It was reported upon by Prof. R. Emmerich, of Munich, at the Eleventh Congress for Internal Medicine, held at Leipsic in 1892.

It forms in amber-yellow transparent hexagonal crystals, which, when powdered, are soluble in one part of water, also soluble in dilute alcohol, very sparingly soluble in absolute alcohol. It melts at 185° F. without decomposition, but is not altered chemically at 212° F.

It is recommended as an antiseptic dressing in surgical practice, and for the treatment of ulcers, wounds, etc. A solution of one-half to one per cent. is said to be sufficiently strong for a lotion or to saturate dressings. Locally it has been employed in solutions as strong as fifty per cent. without any injurious effect.

The sole drawbacks are said to be a tendency to act on instruments, causing a black deposit, and a tendency to discolor the skin and clothing. *Beaumont Small.*

OXYURIS VERMICULARIS. See *Nematoda*.

OZÆNA. See *Nasal Cavities, Diseases of: Chronic Inflammation*.

PACHYAKRIA. See *Acromegaly*.

PACIFIC CONGRESS SPRINGS.—Santa Clara County, California.

Post-Office.—Saratoga. Hotel and cottages.

Access.—Stages connect at Los Gatos with Southern Pacific trains leaving San Francisco morning and evening. Time, three hours and fifteen minutes.

These springs obtain their name from their resemblance to the well-known Congress Spring at Saratoga, N. Y. The Santa Clara Valley is celebrated for its excellent climate and dry, pure, and invigorating air. A large and commodious hotel and several cottages have been established at an elevation of 735 feet above the sea level. The springs are located about one hundred feet farther up the mountainside. The drives about these springs are among the finest in the State. There are on the premises several springs which flow in great profusion. The waters belong to the alkaline-chalybeate class. They are valuable for table purposes. The following analysis was made by Anderson in 1888:

One United States Gallon Contains:

Solids.	Grains.
Sodium chloride	115.76
Sodium carbonate	120.42
Sodium sulphate	12.95
Potassium carbonate	2.06
Magnesium carbonate	26.34
Magnesium sulphate	14.17
Calcium carbonate	16.03
Calcium sulphate	14.19
Ferrous carbonate	13.87
Alumina	4.50
Silica	3.98
Organic matter	Trace.
Total	344.27

Free carbonic acid gas 44.17 cubic inches. Temperature of water, 50° F.

It will be observed that this water is much less densely mineralized than is that of its New York namesake. The Saratoga Congress Spring contains over 700 grains of solid ingredients to the United States gallon and over 392 cubic inches of carbonic-acid gas. The California Congress waters are, however, much more strongly chalybeate than are those of Saratoga. Their action is decidedly tonic, owing to this large infusion of iron. They are also mildly aperient (from the presence of Glauber's and Epsom salts), diuretic, and anti-acid (from the presence of alkaline carbonates). The springs have gained considerable celebrity in the treatment of anæmia, dyspepsia, liver and kidney troubles, irritability of the bladder, rheumatism, gout, and cutaneous affections. The waters are shipped to all parts of the coast.

James K. Crook.

PACINIAN CORPUSCLE. See *End-Organs, Nervous.*

PACINIAN CORPUSCLES, PATHOLOGY OF.—Very few observations have been made upon the occurrence of pathological changes in the Pacinian corpuscles.

Virchow noted the possibility of the development of the so-called lamellated fibroma from Pacinian corpuscles, but regarded such origin as being of the nature of a pathological curiosity.

Osler (Proceedings of the Pathological Society of Philadelphia, 1886) reported a case of hemorrhagic pancreatitis in which the Pacinian corpuscles were enormously swollen and œdematous and the neighboring tissue was infiltrated.

Przewoski (*Arch. f. path. Anat. u. Phys.*, Bd. 63) describes five cases of œdema of the Pacinian corpuscles which occurred in mitral insufficiency, in chronic nephritis, in emphysema, and in two cases of chronic pulmonary tuberculosis. In the first two cases general œdema was present, but not in the other three. He claims to have been the first to observe this condition.

Rattone (*Archivio per le scienze mediche*, Torino, vol. ix.) also describes a case of local œdema of the Pacinian corpuscles. In a case of scoliosis, in which no other pathological changes of note were found, the Pacinian corpuscles about the pancreas showed an extreme grade of œdema. He, as did Przewoski, at first took the cyst-like bodies to be cysticercus cysts, but microscopic examination showed them to be Pacinian corpuscles. In a case of fibroma of the mamma, occurring in a young male, he found a much compressed Pacinian body. The chief symptom of the case had been agonizing neuralgic pain, and Rattone believes that this was caused by the changes produced in the Pacinian corpuscle through pressure. There were no evidences of inflammation in or about the corpuscle.

The most extensive observations yet made upon the pathology of the Pacinian corpuscle are those reported by the writer (*Phil. Monthly Med. Jour.*, February, 1899). In nine cases pathological changes were found in Pacinian corpuscles embracing the following conditions: congestion, œdema, hemorrhage, changes in vessel walls, acute and chronic inflammatory processes, mucous and colloid degeneration, hyaline deposit, calcification, and necrosis.

In one case of pulmonary gangrene great numbers of hyaline or cystic bodies, varying in size from a pinhead to a small cherry, were found in the mesentery, particularly in the neighborhood of the pancreas and semilunar ganglia. The majority were transparent, jelly-like, and fluctuating, suggesting parasitic cysts. Microscopical examination showed these to be Pacinian corpuscles in various stages of cystic change. The interstitial tissue of the lamellæ contained large cyst-like spaces in which a mucin- or pseudomucin-like substance was present. These changes were confined to the corpuscles, and were apparently primary. In some of the corpuscles the presence of congestion, small hemorrhages, and small-celled infiltration would appear to justify the diagnosis of a primary inflammation (Pacinitis) of the Pacinian corpuscle.

In a case of chronic parenchymatous nephritis, mitral insufficiency, and general œdema, a similar condition of œdema and cystic change was found, which was regarded as secondary to the general œdema.

In four cases hyaline change of the Pacinian corpuscles was found: in two cases in the peritoneum and mesentery, in the other two in the region of the prostatic plexus. The hyaline bodies showed transition stages to an appearance similar to the lamellated fibroma, as described in the literature. In two other cases similar hyaline bodies were found, but they were so changed that their genesis could not be determined.

In a case of femoral thrombosis chronic inflammatory changes were found in and about the Pacinian corpuscles present in the vessel sheath. The process was regarded as an extension from a chronic inflammatory process involving the sheath of the vessels and the vessels themselves.

In a case of hemorrhagic pancreatitis necrosis, œdema, and hemorrhage were found in the Pacinian corpuscles in the neighborhood of the pancreas. These changes were regarded as secondary to the pancreatic disease, the marked liquefaction necrosis of the nerve structure being due to the action of pancreatic ferments. The involvement of the Pacinian corpuscles and nerve trunks may be the immediate cause of death, as suggested by Osler.

Since the report of these cases the writer has observed four other cases in which pathological conditions of Pacinian corpuscles were found. Œdema and cystic degeneration were observed in the corpuscles in the neighborhood of the pancreas, in a case of valvular disease of the heart with general œdema, and in a case of colitis without general œdema. In a scirrhous carcinoma of the mammary gland a much compressed Pacinian corpuscle was found, completely surrounded by carcinoma tissue. In contrast to the case observed by Rattone this patient had never suffered pain. In a second tumor of the mammary gland, a cystadenofibroma, a much compressed Pacinian corpuscle was found extending across a large cyst filled with serous fluid. Though surrounded on all sides by fluid, the corpuscle showed no change beyond that of compression. The tumor in this case was painful.

It would appear from the above cases that œdema or cystic change is the most common primary, as well as secondary, pathological condition of the Pacinian corpuscles. The exact significance of this condition cannot at present be stated; nor in the primary cases is the genesis of the condition clear. In these cases the œdema is probably to be referred to some local circulatory changes, probably to changes in the blood-vessels of a sclerotic or inflammatory nature. In the other cases the secondary nature of the affection is clear.

Inasmuch as the physiology of the Pacinian corpuscles is still in doubt, the clinical significance of these changes cannot at present be known. The presence of large numbers of the corpuscles about the pancreas would indicate that they serve some important sensory function, probably relating to intra-abdominal pressure; and we are justified in assuming that any extensive disease of these bodies would produce important disturbances and give rise to clinical symptoms. The intense abdominal pain occurring in acute pancreatitis may be explained by the involvement of the Pacinian corpuscles and the nerve trunks in the vicinity of the pancreas. As Osler has suggested, death in these cases may result from shock caused by such involvement. That compression of the Pacinian corpuscle does not always give rise to severe pain is shown by the case of scirrhous carcinoma of the mamma. This case may, however, be explained by the assumption that the nerve trunks had been destroyed by carcinomatous infiltration, the more resistant corpuscle remaining preserved. The paucity of observations and our lack of knowledge regarding these structures make desirable more careful investigations as to their physiology and pathology.

Aldred Scott Warthin.

PÆONY. See *Ranunculaceæ.*

PAGET'S DISEASE OF THE NIPPLE. See *Cancer.* (*Clinical.*)

PAGOSA SPRINGS.—Archuleta County, Colorado.

Post-Office.—Pagosa Springs. Hotel and boarding-houses.

Access.—Viâ Denver and Rio Grande Railroad to Amargo, N. M., thence twenty-eight miles by daily stage over a good road to the springs.

This resort is located in a picturesque, heavily wooded mountain region, at an altitude of about seven thousand feet above the sea level. Bear, elk, deer, and wild turkeys abound in the neighboring mountains, and it is said that a basket of trout may be taken at any time without going beyond the village limits. The country is new, but is fast being developed, and hundreds of people from different parts of the United States camp out in the

neighborhood every summer in order to avail themselves of the salubrious climate and many other attractions to be found here. There is considerable snow in January, February, and March, but during the remainder of the year the weather is clear and beautiful. The summer temperature reaches 90° F. at times, but owing to the bracing atmosphere no discomfort is felt. The nights are always cool. There is but one mineral spring at Pagosa. It is situated on a small elevation and from it the water issues through crevices in various directions. The water supply is quite inexhaustible, as it is estimated that the combined currents from the spring would form a stream three feet deep and six feet wide. Dr. H. G. Haxley, of the springs, furnishes us the following analysis, supposed to have been made under the auspices of the United States Government when it maintained a fort at this point:

Pagosa Hot Springs.

One United States Gallon* Contains:

Solids.	Grains.
Sodium chloride	61.81
Sodium carbonate	83.27
Sodium sulphate	150.21
Calcium carbonate	41.76
Magnesium carbonate	6.65
Lithium carbonate	3.28
Potassium carbonate	2.80
Iron protoxide	.16
Manganese protoxide	.11
Calcium fluoride	.30
Calcium phosphide	.03
Silica	.71
Total	351.09

Temperature of water, 155° F. Elevation, 7,000 feet.

* Converted from grams per litre.

The waters are said to possess valuable properties in the treatment of rheumatism, gout, syphilis, and anæmic conditions. Dr. Haxley informs us that he has seen obstinate cases of chronic rheumatism cured or greatly benefited by a two weeks' course of the hot baths.

James K. Crook.

PAIN.—From a restricted philosophical view pain may be regarded as a reaction of the organism, in part or as a whole, to harmful influences; giving a warning in consciousness that some activity prejudicial to the health of the tissues is operative.

The movements of expansion and contraction in protoplasm, the biologists say, are primordial expressions of the pleasure-pain sense; expanding in response to pleasure-giving (healthful) and contracing in reaction to pain-giving (harmful) impulses. These reactions are considered the germ of the idea which by numerous multiplications, complications, and added phenomena have come to make the many-sided figure of the human pleasure-pain sense.

The pain of trauma, in a bruised bone, or the discomfort of a mechanical process, as the pressure of an exudate or transudate, the irritation of an inorganic or organic toxic agent, the pain of ulceration or of necrosis—these are of the types of painful sensations, viewed in a narrow sense, which the physician most often is called upon to treat. But there may be pain in consciousness connected with more complex processes than those just mentioned. The pain of fear, of anxiety, of dread, of anger, even the peculiar pain of the "sick soul" and the ecstatic states, and of other and various emotional conditions, are no less real pain than those of an irritated or injured sensory nerve. Even these manifold and complexly intricate emotional states, however, are posited by the terms of some descriptive psychologists as the results of organic visceral reactions, mostly represented in the sympathetic nervous plexuses and in the extra-cortical or subliminal mental activities.

Of the intricacies and the extraordinary width, breadth, and depth of the pleasure-pain sense only a most extensive study of the ancient and current literature of anthropology, neurology, psychology, and sociology can give an adequate idea, and the present discussion is limited in scope to the narrow field of that which may be termed pain in the common-sense view of the term—the reaction of the sensory nervous system to a prejudicial activity. It will be limited to the painful sensations of the periphery (the epiblastic substances—the skin and external mucous membranes), of those organs and surfaces which are formed by involution of the primary epidermal structures—as the intestinal canal, the bladder, the pleuræ; further, to those pains which occur in the mesoblastic structures—the muscles, the bones, the viscera, etc.

Varieties of Pain.—From simple discomfort to agony the gradations of pain are many, but a few types seem to be associated with recognizable types of lesion. Two types of pain may be distinguished at the outset—*acute* and *chronic*—indicating in a general way, first, the more violent reaction of the sensory nervous system to an irritant; and, secondly, that of the more prolonged and habitual protest of nature against the harmful influences of a chronic process. Acute pains usually call for immediate diagnosis, if not immediate treatment; chronic pains, as a rule, demand a study of the more involved and intricate processes of nature.

Pain, again, is spoken of as *periodic, recurrent, alternating*, or *continuous*.

As to character, *acute darting* pains are characteristic of the neuralgias, myalgias, and neuritides—such pains are frequently *paroxysmal* or *remitting* in type, coming and going with great suddenness and leaving no trace of their presence, save at times a certain sense of soreness after frequent attacks. Such pains, moreover, are distributed usually in definite anatomical areas, which fact is of the utmost importance in their diagnosis and treatment. In many instances this type of pain is recognized as shifting in its distribution. At one time the nerve distribution in the foot is affected; again, the same nerve area of the thigh, then the leg representation; again, the painful sensations may be distributed over a definite segment area; on one side or on opposite sides of the body.

Colicky Pains are characteristic of affections of the hollow viscera. The stomach colic of poisoning and of cholera morbus, the abdominal colic of flatulency, of distention and obstruction of the intestine, the tenesmus and pain in the ureter and bladder from urethritis, pyelitis, cystitis, etc., are the results of the cramp-like muscular activities of these organs, usually engaged in the process of ejecting, or trying to eject, a harmful occupant. In the diagnosis of these pains the sense of muscular effort is often present in the patient's consciousness and is a useful guide. Careful questioning of a discriminating patient will often reveal much. In the treatment of these conditions the carrying out of nature's indications is rational. Thus, at the present time, catharsis and enteroclysis are more frequently employed for the initial stages of cholera morbus, diarrheas, and dysenteries than are narcosis and muscle paralysis by opium and similar drugs.

Boring or *growing* pains are deep-seated, illy defined pains frequently found in visceral disease. The bones, the muscles, the meninges, the spinal column, the liver, or other deep-seated viscus may be involved. Aneurisms, new growths, and other lesions in these more remote localities are often the cause of *dull* pains. It is usually advisable to regard them at their worst if regrets of faulty diagnosis are to be avoided. Many of the brilliant diagnoses of the specialist may be anticipated by the family practitioner, if sufficient consideration is given to all dull pains of a persistent chronic or remittent nature. The so-called growing pains may be classed in this category and too frequently prove to be precursors of acute or chronic joint lesions, which on development entail much misery and suffering on the young. *Movement* pains are those which are increased by motion of the joints or of the muscles and are indicative of some lesion in these structures.

Pain Appreciation.—If pain be regarded as a reaction, evidently two factors, at least, are involved in its appreciation. The character or intensity of the inducing agency and the individual's susceptibility. Since each individual's own experience is the only guide to the physician's estimation of the intensity of the painful feeling, much judgment and sympathy are needed correctly to gauge the patient's susceptibility. Pain to many is but an incident. They are either anæsthetic or stoical, either really feeling little or able to control their expressions of pain; others, again, are hyperæsthetic or exaggerational; either they really are extremely susceptible or they possess little or no control over their feelings. At all events the grade of the patient's own feeling is the true measure of the pain for themselves, but it may not be a useful guide in the diagnosis of a disease process.

It has become popular, since the studies of Lombroso and his school, to generalize regarding pain susceptibilities among individuals in certain occupations or professions, or among the peoples of a country. Thus the Teutons are reputed to be relatively non-susceptible; that thieves, prostitutes, and the like are anæsthetic. Such generalizations are founded on the most flimsy evidence and are based purely on half-truths at best. Moreover, the question of control over one's expressions of pain is rarely taken into account by many of these students.

Pain that is acute and severe in character usually causes a well-known picture of contracted muscles, dilated pupils, cold wet hands and feet, a picture closely resembling and indeed inducing at times the well-known act of fainting.

Pain Location.—For the most part the feeling of pain is referred to the diseased area, and when lesions are found to be superficial and within reach it is easy at once to distinguish their true nature and to locate them correctly, and then to apply the proper treatment. When no superficial lesion is found, the question arises whether the pain sensation is in direct relation to an adjacent organ or whether it is a referred sensation from a more remote viscus.

Of the facts which help to a correct judgment the grade of pain intensity is one of the most important. Those pains which are less intense and more illy defined are more liable to be referred pains from a more remote area.

By the researches of Dana and Head* the mapping of areas of referred sensations has become an almost definite matter. Head has shown that a diseased viscus very frequently, if not always, sends sensory impulses to the spinal cord, which impulses are felt as irregular pains, usually dull, at times very acute, in the skin area supplied by the sensory nerve of the spinal-cord segment related to the viscus segment. By means of the work of this author and others many of the earlier charts illustrating referred pains are being revised, and more definite conclusions are now possible, although as yet many of the ascertained facts have more importance in neurological than in general diagnosis.† *Smith Ely Jelliffe.*

PALISADE WORMS. See *Nematoda.*

PALM BEACH, FLORIDA.—This popular and fashionable winter resort is situated in Southern Florida on the east coast, in latitude 26° 57′, about two hundred and eighty miles south of Jacksonville. It lies upon a narrow strip of land between Lake Worth and the Atlantic Ocean. The vegetation at this latitude is naturally tropical and luxuriant, and art has added to the natural beauty by parks, gardens, and paths running through groves of palms and tropical trees. Flowers abound, and such tropical fruits as the banana, pineapple, guava, tamarind, and mango are found here. Indeed, nature and art have combined to render this spot peculiarly attractive and fascinating. The accommodations are luxurious and consequently expensive. There are two large hotels affording every comfort, and several smaller and less expensive ones. There are also numerous fine private residences. Many means of recreation are offered the visitor: bicycling through the many beautiful paths; fishing,

FIG. 3728.

rowing, sailing, shooting, surf bathing, swimming in a large salt-water pool, and golf upon the fine and extensive links. Hot salt-water baths are to be had in some of the hotels. Palm Beach is easily and comfortably reached direct by railway from Jacksonville. One is referred to the article upon *Florida* in this HANDBOOK for an extended consideration of the climate of Florida, including this region. In this article will be found the climatic data for Jupiter, which is only seventeen miles north of Palm Beach, and which therefore has essentially the same climate as that of Palm Beach. The average mean temperature (Fahrenheit) for the months of December to March inclusive is: December, 67.2°; January, 63.4°; February, 66.7°; March, 68.8°. The maximum temperature for the same months is: December, 83°; January, 80°; February, 84.7°; March, 85.5°. Minimum, December, 41°; January, 38.5°; February, 39.8°; March, 44.8°. The average relative humidity is 82 per cent. The average number of clear and fair days is: December, 23.9; January, 24; February, 22.1; March, 27.1. The average precipitation is: December, 2.88 inches; January, 3.43; February, 2.72; March, 2.59.

The distinguishing characteristics of the winter climate of Palm Beach are warmth, sunshine, equability, and moisture. It is a warm, moist, marine climate. Such a climate is well suited for elderly and feeble persons, convalescents of a certain kind; for persons affected with neurasthenia or with chronic bronchitis, and for the valetudinarian in general, but not for those who are affected with pulmonary tuberculosis. For one who desires to escape the inclemency and strain of a northern winter and live an outdoor existence in the midst of attractive surroundings, and who, moreover, is able to pay for luxurious accommodations, Palm Beach can unqualifiedly be recommended. Further, it is easily and comfortably reached from the North. Good medical service is at hand, which is a matter of the first importance in a health resort. The season extends from December to March.

Sixty-seven miles south of Palm Beach is *Miami*, the terminus of the East Coast Railway and the port of departure for Nassau, Havana, and Key West. It is a town of about three thousand inhabitants. "The Royal Palm," a large and luxurious hotel, is situated here in the midst of a large tropical park. The climate is essentially the same as at Palm Beach, and much the same sort of outdoor life and amusements are afforded the visitor here as at the former place. *Edward O. Otis.*

PALMYRA MINERAL SPRINGS.—Jefferson County, Wisconsin.

POST-OFFICE.—Palmyra Springs. Hotels and sanitarium.

ACCESS.—Viâ Chicago, Milwaukee and St. Paul Railroad to Palmyra, 118 miles north of Chicago and 20 miles west of Waukesha. The sanitarium stage meets trains.

Palmyra is a pretty little town of 1,000 inhabitants, nestling in the foothills of the famous Kettle Range of Wisconsin. The location is 850 feet above tide-water, and it combines many of the features sought after by the summer seeker for health or recreation. This entire section is favored with a salubrious climate, and is altogether free from malaria. The soil is dry, sandy, and porous, overlying glacial deposits of gravel, which affords the best natural facilities for through drainage. The scenery here is noted for its tranquil beauty and loveliness. In his attractive brochure on "Summer in the Northwest" Mr. W. J. Anderson informs us that the beautiful little Spring Lake, or Palmyra Lake, as it is generally called, "may be classed as one of the gems of Wisconsin. Its bottom is covered with mosses, ferns, and other aquatic plants, which in mid-summer bloom and blossom as a garden. It is fed by numerous mineral springs in the vicinity, and affords an enticing prospect for the angler or the lover of boating." Seven miles distant is the Scuppernong trout pond, which is said to contain millions of trout of all varieties and sizes. Many other beautiful lakes are within easy driving distance, over excellent roads. The Palmyra Springs Sanitarium is delightfully situated on the margin of Palmyra Lake, of which it commands a charming view. This is a substantially built brick structure, four stories in height, containing spacious halls, wide verandas, and all the modern accessories for the health and comfort of its occupants. There are facilities for the administration of electricity in its various forms, massage, etc. The baths embrace salt, shower, shampoo, Turkish, Russian, and natural mineral-water baths, the rooms being spacious and luxuriously furnished. All kinds of facilities for indoor and outdoor diversions are at the option of the guests. Directly opposite the sanitarium is a forty-acre forest of native oaks—the "Sanitarium Grove." Its winding walks and shaded nooks add no little to the attractiveness of the place. At a distance of one mile and a half from the sanitarium is the great Geyser Spring. It is thirty-eight feet in depth and fifty feet across the surface, and supplies ten million gallons of water per day. The water is soft, pure, and palatable, and is believed to possess remedial value. The mineral springs at Palmyra are very numerous. A cluster of half a dozen in the spring park, which could all be covered by a canvas forty feet square, are quite dissimilar in taste, of varying temperature, and of different analysis. One spring is slightly thermal, having a temperature of 72° F.; another, ten feet distant, is a little cooler (62.5° F.); while others vary in temperature from 50° to 52° F. Back of the sanitarium, and four hundred feet from it, is another group, known as Magnesian Springs. They are remarkably pure and free from organic matter. Following are analyses of three of the springs, No. 1 being by Prof. W. S. Haines, of Rush Medical College, Chicago, and Nos. 2 and 3 by Prof. Bode, of Milwaukee:

Spring No. 1.—One United States gallon contains: Sodium sulphate, gr. 0.94; potassium sulphate, gr. 0.23; calcium bicarbonate, gr. 15.70; magnesium bicarbonate, gr. 10.94; magnesium chloride, gr. 0.18; iron bicarbonate, gr. 0.5; calcium phosphate, a trace; alumina, a trace; silica, gr. 0.70; organic matter, a trace. Total, 28.74 grains.

Spring No. 2.—One United States gallon contains: Sodium chloride, gr. 0.21; sodium sulphate, gr. 0.64; sodium bicarbonate, gr. 0.16; calcium sulphate, gr. 0.30; calcium bicarbonate, gr. 9.86; magnesium bicarbonate, gr. 7.91; iron bicarbonate, gr. 0.6; alumina, gr. 0.19; silica, gr. 0.61; organic matter, gr. 0.35. Total, 20.29 grains.

Spring No. 3.—One United States gallon contains: Sodium chloride, gr. 0.43; sodium sulphate, gr. 0.40; sodium bicarbonate, gr. 0.18; calcium sulphate, gr. 0.80; calcium bicarbonate, gr. 12.84; magnesium bicarbonate, gr. 10.14; alumina, gr. 0.22; silica, gr. 0.90. Total, 25.91 grains.

These waters all possess mild diuretic and antacid properties. The water of Spring No. 3, being entirely free from organic matter, is well adapted for carbonating and bottling. The numerous topographical, climatic, and other advantages of Palmyra render it a suitable resort for a large variety of ills and ailments. The spring waters exert a beneficial influence, especially in rheumatism and dyspepsia, although their use is also extended to functional hepatic disorders, the early stages of Bright's disease, and to eczema, pityriasis, and other skin troubles. *James K. Crook.*

PANACEA SPRINGS.—Halifax County, North Carolina.

POST-OFFICE.—Littleton.

ACCESS.—These springs are situated three and a half miles from the town of Littleton, at an altitude of 380 feet above the sea-level.

The location is in a beautiful valley surrounded by picturesque hills covered with rocks of immense size, and still clothed in their primeval forest growth of gigantic oaks. The meteorological conditions which prevail here are of a salutary character, there being neither long droughts nor excessive rains. The springs are fifteen or twenty in number and flow about five hundred gallons of water per hour. The following analysis was made some years ago by Dr. H. B. Battle, of the State Experiment Station. The bases and acids only are given: One United States gallon contains: Iron, gr. 2.18; alumina, gr. 0.32; calcium, gr. 1.11; magnesium, gr. 0.20; manganese, gr. 0.01; potassium, gr. 0.70; sodium, gr. 2.23; hydrochloric acid, gr. 0.82; suphuric acid, gr. 0.42; phosphoric acid, gr. 0.53; silica, gr. 1.18. Total, 9.70 grains. (Carbonic acid, large amount; not determined.)

It is evident that the acids and bases would unite in the form of carbonates, chlorides, sulphates, and phosphates.* The waters are very useful in chronic diarrhœa and the debility which usually accompanies the disease. They are highly recommended in the debilitated states attending uterine and ovarian diseases and in restoring anæmic and puny children. *James K. Crook.*

PANARITIUM ANALGICUM. See *Morvan's Disease.*

PANCREAS, ANATOMY AND PHYSIOLOGY OF.—1. GROSS ANATOMY.—The pancreas is an elongated gland of a reddish-yellow color. The size is somewhat variable in different individuals, but the gland is usually from

* Head and Campbell, "Brain," vol. 23, 1900, p. 353.
† Pain: James Mackenzie, M.D., "Brain," Autumn, 1902, p. 368.

* According to E. E. Smith, M.D., Ph.D., of New York, to whom we have submitted this analysis, the combinations would result as follows. In one United States gallon there would be: Sodium chloride, gr. 1.31; sodium sulphate, gr. 0.68; sodium bicarbonate, gr. 0.93; potassium bicarbonate, gr. 1.02; calcium bicarbonate, gr. 4.85; magnesium bicarbonate, gr. 1.21; manganesium bicarbonate, gr. 0.03; iron bicarbonate, gr. 3.98; iron phosphate, gr. 0.32; alumina, gr. 0.31; silica, gr. 1.18. Total, gr. 16.32.