

erwise. It is brought on by overstudy, by sexual excess, or possibly by coitus reservatus, by long continued depressing emotions, failure in business, frequent excitements, long marches, and exhausting efforts of all kinds. Onanism and unrequited love have been cited as fruitful causes. It is frequently seen after recovery from long attacks of prostrating diseases, more especially the essential fevers. Being to some extent an occupation neurosis, it is far more frequent in males than in females. It seems to occur with unusual frequency among ironworkers engaged in high-building operations.

Symptoms.—By what means are we able to identify the condition of neurasthenia cordis? The cardiac features predominate, although general nervous manifestations are usually prominent. The patient as a rule is fretful, irritable, and fidgety. He is easily startled on sudden excitement and is apt to be more or less hypochondriacal in his tendencies. The cardiac attack itself is liable to begin with some quickening, possibly more or less irregularity or intermittence of the heart. The first cardiac sound is short and lacking in volume; the second sound is not accentuated. Palpitation is not common, but there may be a feeling of more or less uneasiness about the heart. The patient is apt to show vasomotor disturbances in the shape of frequent changes of color in the face and sudden coldness, followed by burning heat of the hands and feet. There are no œdema of the feet or ankles and no dyspnoea, but in severe cases there may be sufficient local distress to resemble pseudo-angina. The sleep is liable to be restless and the patient wakes with a sudden jump of the heart. After the stage of irritability the patient falls into a state of more or less depression, marked by defective nutrition. Insomnia is a constant symptom. In some cases the patients are unable to be up and must remain in bed. The pulse continues to be weak and excitable and the sphygmograph shows marked diastolic.

Diagnosis.—The diagnosis of neurasthenia cordis is to be reached by discriminating consideration of the symptoms, as above outlined, and by exclusion. The term weak heart is too often used as a cloak. This condition is not one of palpitation on the one hand, nor of tachycardia on the other. The patient's general long-continued neurasthenic state, coupled with the cardiac symptoms and with the absence of any signs or symptoms of organic trouble, of Addison's disease, diabetes, carcinoma, or tuberculosis, renders the existence of neurasthenia cordis a practical certainty.

Prognosis.—Neurasthenia cordis seldom destroys life directly, but it forms a bad accompaniment for acute prostrating diseases. Patients succumb much more readily to typhoid or other intercurrent affections. The condition is essentially chronic and a long duration may usually be predicted.

Treatment.—This should consist chiefly of cheerful surroundings, agreeable society, and pleasant occupation. The food should be simple, abundant, and easily digested. Daily systematic outdoor exercise, particularly walking at a slow or moderate pace, should be advised. A morning shower bath as cold as the patient can endure and react from with comfort is a useful habit to inculcate. Da Costa allows alcohol in liberal quantities to patients of this type, but it seems to the writer that this remedy should be used as discriminatingly in these cases as elsewhere. One of the lighter wines may be allowed with meals, but in most cases the extract of malt will answer all purposes to be gained from alcohol and with less likelihood of unpleasant results. A very useful stomachic tonic and reconstructive is as follows: R. Acid. hydrochlor. dil., Tr. nucis vomicæ aa fl. ʒ. ʒ. iv.; Elixir lactopeptin q.s. ad fl. ʒ. iij. M. et Sig.: A teaspoonful in half a wineglassful of water before each meal. Cascara, rhubarb, and Kutnow's improved sprudel salt used alternately are to be preferred for the constipation of these sufferers. The bromides, valerian, and even opium may be required at times. Digitalis and nitroglycerin are useless.

THE IRRITABLE HEART.—Under this name a form of

cardiac neurosis is described in various ways by different writers. The term was originally used by Da Costa in describing a peculiar cardiac excitability which he found to exist among soldiers in the field. The condition is much more frequent among men than among the gentler sex, and is usually seen prior to the thirtieth year of life. The patient complains that he is never free from a tired feeling about his heart, sometimes a sharp pain is felt. The organ is liable to throb and jump and is never entirely outside of consciousness. Even when the patient is lying quietly in bed it makes itself a nuisance, banging away at the time when he should be asleep, while exercise or exertion brings on a violent beating (Allbutt). In most cases there is a history of overexertion. The trouble frequently remains among college men as a reminder of the rush and crush and indiscretions and untamed passions of youth. Spasmodic bouts of study, overdoses of alcohol and tobacco, late suppers, overwork in the gymnasium, and other incidents of an irrational and irregular life in a nervous or dyspeptic young person usually go to form the groundwork of the irritable heart. A physical examination may show a slight degree of hypertrophy, but dilatation is most frequently present. The peripheral arteries are lax and the pulse is diastolic; its slackness is in marked contrast with the excitable state of the heart itself. The rhythm of the cardiac contractions is often a little uneven and the second sound at the apex too loud. The action of the heart may seem labored and heavy under the palpating hand. A murmur may possibly be heard, but more often simply an impurity of the first sound, as though it were dimmed by a distant murmur.

Treatment.—Prevention of this trouble during the early years of young adult life is of the utmost importance. Young men especially should be warned of the dangers of an unsteady method of life. Violent and irregular exercise, drinking and smoking to excess, late hours and sexual indiscretions should be guarded against. Adolescent youths are prone to err in all of these directions, and it is the function of older and wiser persons to inculcate correct and uniform habits. If the condition which we know as the irritable heart has actually become established, the medical adviser of the patient must set himself to the task of repairing the mischief without delay. The patient's daily habits must be carefully investigated, and his life made as tranquil and as free from sources of irritation or excitement as possible. His good health cannot possibly be recovered by any other means. It is useless to give digitalis or other cardiac tonics or stimulants, though at times a systematic exhibition of bromides in small doses may serve a useful purpose. In many cases a complete change of scenery and surroundings is required. A temporary removal to a quiet rural locality absolutely free from temptations to indiscretions or excess is usually followed by good results.

ARRHYTHMIA (*a*, privative, and *ῥυθμός*, rhythm), known also as the *pulsus inæqualis* or *pulsus irregularis*, is a disturbance of the rhythmic contractions or regularity of the heart. The rhythm of the heart may be normally intermittent or irregular in some persons, and slight deviations of this kind are not incompatible with the complete and proper performance of the cardiac functions. It is not uncommon to notice certain disturbances of the rhythm in childhood, especially during sleep, which disappear after the child wakes and runs about. This has no pathological significance, but the irregularities which are increased by exercise or excitement, especially if accompanied by pain or palpitation, are always a sign of gravity. Irregularities of the heart may be due to direct, reflex, or toxic causes, or a combination of any or all of these. According to Roy and Adami, they are brought about by the failure of the auricles to respond to some of the contractile influences which reach them from the sinus (venosus), or by the interference of the sinus and ventricular rhythm with each other. Ultimately the cause of all irregularity may be traced back to inhibition of the heart through, but not by the vagus. Simple intermittence is always an indication of cardiac

failure due to anemia, overwork, or worry. It may be associated with valvular lesions, but has only an incidental connection with them. Intermittence may be true or false. In true intermittence the heart itself actually omits a contraction, while in false intermittence the organ contracts but the pulse wave is not transmitted to the wrist. These insufficient waves are known as "frustrate" contractions and sometimes observe a form of regularity themselves, *e.g.*, the second, third, or even up to the tenth or fifteenth contraction may be a frustrate, or two frustrates may appear together successively, or they may be irregular for some time and then show themselves in rapid succession. In some instances these frustrate contractions are simply due to a slight nervous disturbance and have no real significance. Among the writer's patients is a man of sixty, usually in the best of health, whose heart has shown these intermissions for the last fifteen years. Sometimes strong and weak beats alternate with each other regularly, giving rise to what is termed the *pulsus alternans*. Two strokes in quick succession followed by a longer pause constitute the *pulsus bigeminus*, three strokes the *pulsus trigeminus*. A combination may occur constituting the *pulsus bigeminus alternans*.

ALLORRHYTHMIA (*ἄλλος*, another) is a condition in which a distinct method is observed, the irregularity being always the same. When, in addition to this state, the heart is tumultuous, it is known as *delirium cordis*. The writer has at the present time a case under observation in which acceleration, intermittence, and irregularity are combined, the pulse rate never being less than 160 per minute, and complete allorhythmia being present. The *pulsus paradoxus* is more a disturbance of the pulse than of the heart, the pulse being weaker instead of stronger during inspiration. The rhythm of the heart may be in no wise disturbed, but its contractions are not strong enough to propel the blood through the vessels of the thorax against the inspiratory suction force which arrests or holds back the blood wave.

Causes.—Arrhythmia is found occasionally in all of the other cardiac neuroses and the causes which originate those conditions likewise bring about irregularity of the cardiac rhythm. Disease of the brain and spinal cord and pressure upon the nerve trunks by tumors or inflammatory products are among the direct causes. In leucocythemia and progressive pernicious anemia, conditions interfering with the nutrition of the heart, arrhythmia is a frequent accompaniment. It is sometimes due to the pressure on the heart of a large pleuritic or pericardial effusion, or a flatulent or distended stomach. Among the reflex causes may be included diseases or disorders of distant organs or parts, *viz.*, an inflamed ovary or uterus, the passage of a gall-stone, a blow on the stomach, a sharp attack of intestinal colic, or an operation on the pelvic or abdominal viscera. The toxic causes embrace certain drugs, notably muscarin, alcohol, digitalis, strophanthus, tobacco, chloral hydrate, and aconite, all of which may cause interference with the cardiac rhythm. Certain infections, like those of typhoid fever, scarlatina, diphtheria, etc., produce this result. In a severe case of scarlatina under the writer's care in a little girl aged six years, the heart remained intermittent during sleep for some weeks after the passage of the fever.

Symptoms.—The symptoms of arrhythmia are referable chiefly to the heart and pulse and are of an objective character. Many persons have an irregular or an intermittent heart for years without becoming aware of it. In many cases there are no subjective symptoms whatever, while in others there may be a feeling of anxiety about the præcordium or even severe palpitation or anginal symptoms. In grave cases there may be signs of pulmonary œdema, cyanosis, or dropsy. The condition is to be recognized only by a careful observation or actual count of the heart's pulsations.

Prognosis.—This depends entirely upon the cause. It may possess no evil significance whatever, or it may be a harbinger of approaching dissolution. As a rule arrhythmia may be looked upon as a graver symptom than

palpitation. If it disappears under excitement or exercise, it may be disregarded as of little consequence, but if increased under these circumstances it is a sign of gravity. The intermittence or irregularity resulting from the abuse of alcohol, tobacco, and bad habits at the table generally disappears on removal of the offending cause.

Treatment.—The systematic treatment of arrhythmia is closely involved in that of the associated conditions, although the symptoms of irregularity and intermittence will at times require direct attention. If there be present a flatulent or an irritable stomach, measures directed to its relief should not be delayed. If the uterus is displaced, it should be restored to its proper position; if an ovary is diseased or a kidney loose from its anchorage attention must be given to these matters. The arrhythmia following acute febrile states generally disappears with the lapse of a few weeks more or less. In most cases of persistent arrhythmia the daily administration of strychnine, in doses of not less than one-thirtieth of a grain before each meal, is indicated; with this may be combined one-half to one grain of digitalis or caffeine, or two or three minims of the tincture of strophanthus. In cases of high arterial tension, as shown by a hard, incompressible pulse, the use of nitroglycerin is required. If the action of the heart be heaving and tumultuous a warm bath (96° to 100° F.) may be of service, provided there is no atheroma or other organic trouble with the heart or arteries. Mild cases are often benefited by the systematic use of cold baths. Icebags to the præcordial region have been recommended by some excellent authorities. The use of massage is frequently productive of good results. Moderate exercise, regular habits, and proper food should be insisted upon.

TREMOR CORDIS.—This term savors somewhat of pedantry. It should never be understood as being applicable to a morbid entity, but to a symptom sometimes met with in neurotic persons, especially those of a dyspeptic tendency. It is a peculiar form of irregularity of the heart which seizes the sufferer without a moment's warning. The symptom is exceedingly alarming to the patient but is devoid of danger. "Like a bolt from the blue, and with as little warning, a quiet, steady heart is suddenly seized with a rapid fluttering and the ordinary full pulse of health suddenly drops to a mere tremulous thread" (Balfour). The attacks may vary in duration from three or four to a series of short, rapid, incomplete systoles extending over several seconds. On laying the hand over the heart a delicate, tremulous sensation is felt and the radial pulse is scarcely perceptible. The paroxysm ends suddenly with an unusually forcible beat and is never attended by faintness or vertigo. There is no doubt some weakness of the myocardium and cardiac tonics are required, but all direct medication must be subordinated to careful dieting and promoting the general health.

DELIRIUM CORDIS denotes an extreme degree of irregularity accompanied by intermittence and a rolling or staggering sensation conveyed to the palpating hand. It is usually classified as a neurosis, although, as it seems to the writer, improperly so, as true examples of the condition are found only in cases of dilatation and, very rarely, in mitral stenosis. Delirium cordis is not very amenable to treatment, but large and frequently repeated doses of digitalis sometimes give temporary relief.

THE HEART IN GRAVES' DISEASE.—Graves' or Basedow's disease, more recently known as the thyroid cachexia, is classified by numerous authors among the cardiac neuroses. This, it seems to the writer, is not fully warranted. The clinical triad which constitutes the basis of a typical case of Graves' disease are, first, a rapidly acting heart; second, enlargement of the thyroid gland; and, third, protuberance of the eyeballs. All of these symptoms are not invariably present. It often happens that the bulging eyes, or hypertrophied thyroid, are not in evidence. The rapid heart is the most constant symptom, but the writer has seen more than one case presenting all the active signs and symptoms of

Graves' disease, with a heart's action little or not at all accelerated. In a well-marked case of thyroid cachexia, however, the action of the heart is very rapid, amounting to 120 or more beats to the minute. This is often accompanied by a violent throbbing, which extends even to the small arteries. The sounds of the heart are also greatly augmented in volume, being audible in some instances at a distance of several inches from the chest. This peculiar action of the heart differs from simple palpitation by its continuity and by its embracing the small arteries as well as the heart itself in the throbbing. At first there is no structural change in the heart, but the rapid and perturbed action is associated with a falling-off in the ventricular output, and this ultimately leads to residual dilatation with its attendant train of evils. The treatment of the thyroid cachexia is to be directed to the general condition and not to the heart, although a little digitalis combined with Hoffman's anodyne or valerian may be exhibited to mitigate severe throbbing. General tonics, outdoor air, and good food, supplemented by the use of the thyroid or thymus extract, are recognized at the present time as offering the best hope for a modification of the course of this prolonged and obstinate affection.

ANGINA PECTORIS.—This name was introduced by Heberden in 1768. It was intended to denote a strangulation (*angere*, to bind, to strangle). The affection has been known as stenocardia, sternalgia, and breast-pang. There are two varieties, the true, or angina pectoris proper, and the false, or pseudo-angina. True angina is always attended by structural changes and is no more a neurosis than is atheroma or endocarditis. It is usually treated as a neurosis, however, and this is at least partially justified by the fact that the most formidable and striking manifestation of the trouble undoubtedly has its origin in some of the nerve structures communicating with, or located within, the heart. Many authorities have regarded it as a neuralgia. Pseudo-angina is not attended by organic change and is unequivocally a neurosis. The features of false angina are not usually so severe as those of angina vera, but it is not always possible to separate the two. A fatal issue has undoubtedly resulted from pseudo-angina pectoris in some instances.

Causation.—The structural changes which constitute the basis of true angina pectoris do not occur in early life. Thus the affection seldom makes its appearance before the fortieth year of age. All influences which give rise to sclerosis or atheroma of the arterial coats tend to lay the foundation of this dreadful disease. These are notably alcoholic excess, high living, syphilis, gout, lead-poisoning, and overwork, especially of a mental or sedentary character. Probably ninety per cent. of cases occur in males. It is especially prone to appear in persons in the upper walks of life, those of an intellectual occupation being most liable to it. Physicians, clergymen, lawyers, and writers supply the greater number of victims. Heredity plays a rôle in some instances. The paroxysms may be precipitated by exhaustive work or sudden excitement, anger, fright, etc. A patient under the writer's observation suffering from a double aortic lesion developed attacks of unmistakable angina on two successive occasions when taken before a class of students.

Morbid Changes in True Angina Pectoris.—Atheroma of the coronary arteries is the most constant lesion present. Welch found this change in every one of six fatal cases. Embolism of these vessels may also be present, as pointed out by Cohnheim and Virchow many years ago. The process is apt to begin in the ascending aorta at the point of origin of the left coronary artery. The calibre of this vessel may become entirely occluded, or so contracted that a bristle cannot be passed into it. Various other organic lesions have been observed, notably fatty degeneration of the heart, calcification of the aortic valves, aneurism of the aortic arch, pericarditis, and endocarditis. Not every case of coronary sclerosis is accompanied by angina pectoris. The lumina of the vessels are sometimes left sufficiently patent to admit of enough

blood, and in other cases the cardiac circulation is carried on by supplemental coronaries which remain unaffected. It will thus be seen that an imperfect metabolism of the myocardium furnishes the groundwork for angina pectoris. No one has ever seen the heart during a paroxysm of angina, but reasoning from analogy it seems probable that the seizures are precipitated by a sudden ischæmia of the cardiac muscles, the blood supply of the coronaries being for the moment totally, or almost totally, arrested. Pseudo-angina may be produced by any of the causes which have been enumerated as producing other cardiac neuroses. It is in greater or less degree an occasional concomitant of those affections. Probably "angina dyspeptica," a mere gaseous dilatation of the stomach, constitutes a majority of the cases of pseudo-angina pectoris in nervous subjects.

Symptoms.—The paroxysm may set in suddenly without previous warning, although the marks of arterio-sclerosis and general failure of the health and strength may have shown themselves for some years. Cardiac palpitation, arrhythmia, etc., may also have been experienced. The attack may come on when the patient is sitting quietly in bed, but is most likely to appear during some exertion, such as climbing a hill, breasting the wind, or straining at stool, or when laboring under some form of excitement. In true angina the seizure is of overwhelming suddenness and of unspeakable intensity. The pain begins in the præcordial region, usually about the mid-sternum, and radiates as a rule upward into the left shoulder and down the left arm, perhaps as far as the finger ends. Sometimes it is propagated in the direction of the right shoulder, or possibly downward toward the leg or the lumbar region. The nervous system is acutely alert. One of the most characteristic features is the feeling of imminent death. Some patients state that the heart feels as though it were being tightly squeezed in the grasp of a gigantic hand. Probably no condition in the entire range of our knowledge entails more dreadful agony than that of a typical attack of true angina. In some cases a sense of coldness, numbness, deadness, creeping, or other vaso-motor disturbance is felt. In others the pain may not be so acute, but takes the form of a dull ache (*angina sine dolore*) and is overshadowed by the intense anxiety. During the attacks of angina the features are haggard and the face is blanched; the forehead is bedewed with a cold sweat. The respiration, as a rule, is in nowise affected but may be hurried and superficial. The patient is well able to take a deep breath, but is afraid to attempt it. He usually prefers to keep perfectly quiet in a sitting or upright posture for fear of increasing the severity of the paroxysm. A physical examination may or may not show the signs of organic heart disease; the most frequent lesion is aortic stenosis. During the attack the heart's action may be increased or diminished in frequency. In one of the writer's patients it sank below 40 per minute. The blood pressure is always raised at the beginning of the attack. The seizures may last for from a few moments to an hour or more, probably five or ten minutes being about the average. After the attack, which may cease as suddenly as it set in, the patient feels weak and exhausted for a short time. A sensation of numbness and formication in the arms may be experienced. There may be a considerable belching of gas and voiding of a large quantity of urine.

Diagnosis.—This is usually not difficult. No other condition presents the same complex of symptoms—sudden irradiating pain, squeezing, tightening, constriction, overwhelming sense of impending death, etc. As distinguishing between true and false angina, Huchard's aphorisms, while not infallible, are very important: (1) Every angina produced by effort is a true angina. (2) Every angina which occurs spontaneously, without effort, is a false angina. (3) But an angina occurring at night, though independent of effort, is a true angina. Disturbance of the special senses, hysterical manifestations, etc., are far more characteristic of false than of true angina. The absence or presence of signs of organic heart disease is important in the diagnosis. The hysterical

cal pseudo-angina of young women is excluded by the sex and age of the patient, the ability to scream and throw herself about, and the probable presence of anæmia or menstrual disorders. The pseudo-angina of alcohol and tobacco occurs as a rule in young persons and can generally be recognized by the history of the case. The pain here is of subordinate severity. In cardiac asthma dyspnoea is a marked symptom, but is entirely absent in angina pectoris. Then in cardiac asthma are superadded the symptoms of blood stasis in the extremities, cold hands and feet, hyperæmia of the liver, and occasionally the expectoration of blood-stained sputum.

Prognosis.—In true angina the prognosis for complete recovery is hopeless, the anatomical lesions not admitting of restoration. The patient is in constant danger. He may die in the first attack, or after several attacks. Unexpected prolongation of life occurs in some cases. The patient may not have a repetition of the early attacks and may possibly die of other troubles. A case reported by Murrell lasted forty years, and the elder Austin Flint believed that he had seen a case of actual recovery.

Treatment.—This resolves itself into the management, first, of the paroxysm, second, of the interval. When called to see a case during an attack the practitioner should always feel the pulse; this will generally but not invariably be found hard and tense, denoting high arterial pressure, which condition is usually present at the beginning of an attack. The first object of treatment is to lower the blood tension and relieve the strain on the heart. For this purpose the nitrite of amyl is still our most prompt and efficient weapon. This drug may be administered by inhalation, a few drops being placed on a handkerchief and held to the nose, increasing the dose carefully if necessary. Small pearls or capsules may be supplied to the patient with instruction to break and inhale in the event of an attack. Nitroglycerin acts in a similar manner to nitrite of amyl but is much slower. Its effects, however, are more lasting, usually extending over a period of from four to six hours. It is very useful in mild cases of vaso-motor angina and in pseudo-angina. The nitrite of sodium has an effect quite similar to that of nitroglycerin. If the arterial tension be found low and the pain still severe it is better to try the administration of a little chloroform or ether by inhalation, the former being, in the writer's opinion, most trustworthy. These agents must always be used by the physician or a trained attendant. A hypodermic injection of morphine is sometimes demanded. Yeo recommends the continuous current at the inception of a paroxysm. Mild cases may be relieved by antispasmodics and diffusible stimulants such as Hoffman's anodyne, musk, valerian, and assafœtida. Sinapisms or hot-water bags to the surface are sometimes helpful, and the same may be said of the quick application of the ice bag or cold cloths. During the intervals the underlying pathological state—arterio-sclerosis—should be combated by every available means. The iodide of potassium, strychnine, and arsenic form our main reliance. According to Balfour, arsenic is indicated in all heart diseases attended with pain. A most careful and discriminating mode of life is to be observed. All undue exposure and excitement should be avoided and the strictest self-control practised.

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HEART DISEASES: SYPHILIS.—Syphilis of the myocardium manifests itself in the form of a local or diffuse fibroid myocarditis or as a gummatous myocarditis. The interstitial induration is by far the more common process; it may be the result of the direct action of the syphilitic poison or secondary to a syphilitic endarteritis. It occurs in both acquired and congenital syphilis, in the former case as a tertiary lesion. In its earliest stages the interstitial change is found as a cellular infiltration along the small vessels of the intermuscular connective tissue. Fibroblastic proliferation occurs in the latter, leading gradually to the formation of small scattered nodules of granulation tissue, which soon become converted into scar tissue. In the fibroid areas thus formed remains of degenerated muscle, pigment, fat droplets, etc., are found. The newly formed fibrous tissue may undergo caseation or become calcified. The neighboring muscle shows extensive atrophy and fatty degeneration. In other cases the cellular infiltration is in the form of bands or sheets running parallel with the axis of the muscle bundles. These may or may not be sharply defined; usually the new tissue sends out fine prolongations into the neighboring muscle. As the cellular infiltration develops it becomes gradually changed into a coarse hyaline variety of fibrous tissue containing few nuclei. Through atrophy of the intervening muscle the bands of connective tissue gradually coalesce and may come to make up the entire thickness of the heart wall from pericardium to endocardium. The left ventricle, the anterior wall, the apex, and the septum ventriculorum are most commonly affected, the papillary muscles and the walls of the auricles only rarely. In the congenital form the wall of the right ventricle is much more frequently affected than that of the left.

In the majority of cases the fibroid change is directly dependent upon the presence of an obliterating endarteritis in the coronary arteries. Complete occlusion of a terminal branch produces anæmic infarction, the necrosed muscle being replaced by scar tissue; slowly progressive obliteration of the vessels leads to degenerative changes in the muscle with secondary inflammation and proliferation of the interstitial tissue. To the naked eye the fibroid areas appear as white, glistening, tendon-like bands or masses. The weakening of the heart wall, due to the inability of the new connective tissue to contract against the intracardiac pressure, often leads to an aneurismal dilatation at the point of greatest change.

The gummatous form of myocarditis is of much less common occurrence. It is usually associated with a more or less diffuse interstitial change. It is probable that in many cases the fibroid myocarditis found at autopsy is the result of antecedent gummatous processes. Gummata may be found in any part of the heart wall, in the myocardium, or beneath the peri- or endocardium. To the naked eye they appear as yellowish or grayish cheesy nodules, varying in size from a mustard seed to a walnut, and are usually surrounded by a dense fibrous capsule. Fresh gummata are red or pink in color and of a soft homogeneous structure. They do not possess a fibrous capsule and are not sharply outlined from the surrounding tissue. Usually the heart gummata are solitary, but in many cases multiple caseous nodules are found scattered throughout the cardiac wall. When the gumma is located just beneath the peri- or endocardium chronic adhesive pericarditis and sclerosis of the endocardium are usually present. Hypertrophy and dilatation