

EXPLANATION OF PLATE XXIII.

(In all the figures the blue color indicates the superficial, and the red color the deep, cardiac dulness. The shaded wedges show the area over which the murmurs are heard, and indicate by their thickness the intensity of the sound.)

- FIG. 1.—Mitral Insufficiency. Showing slight hypertrophy of left ventricle, and marked hypertrophy of the right side of the heart. Accentuation of pulmonic second sound, indicated by the sign $\cup \angle$ at the base. Murmur heard at apex with maximum intensity, transmitted to the left ($>$) and diminishing.
- FIG. 2.—Mitral Stenosis. Left ventricle of normal size. Hypertrophy of left auricle and of right side of heart. Pulmonic second sound accentuated. Maximum intensity within apex: murmur increasing to first sound ($<$). Not transmitted.
- FIG. 3.—Aortic Insufficiency. Left ventricle greatly hypertrophied. Right side of heart normal in size. Murmur heard over a considerable area, at times with maximum intensity at base in aortic area, at times at lower end of sternum. No accentuation of second sounds.
- FIG. 4.—Aortic Stenosis. Left ventricle somewhat hypertrophied. No changes on right side of heart. Murmur heard with maximum intensity in aortic area, transmitted up into cervical vessels.

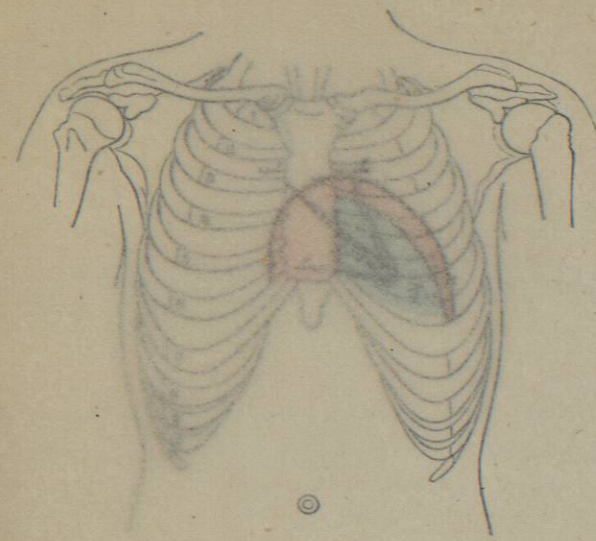


FIG. 1.

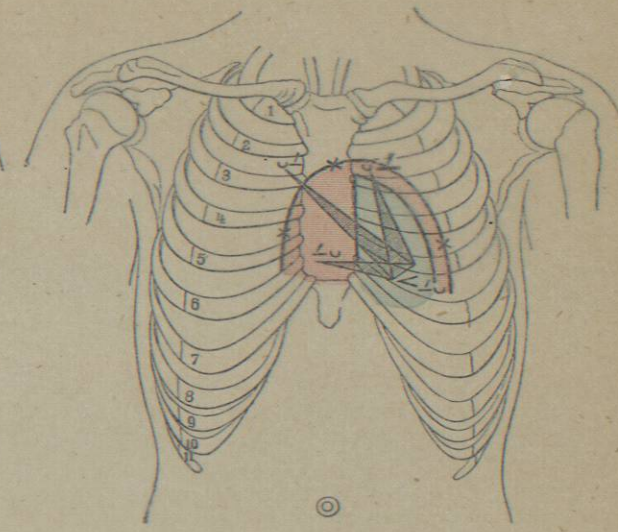


FIG. 2.

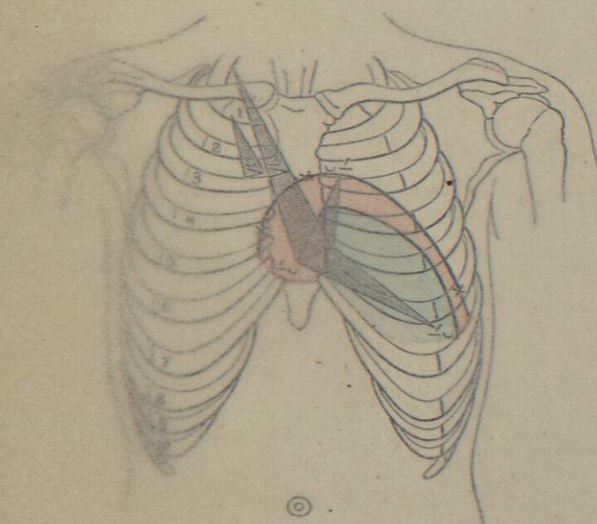


FIG. 3.

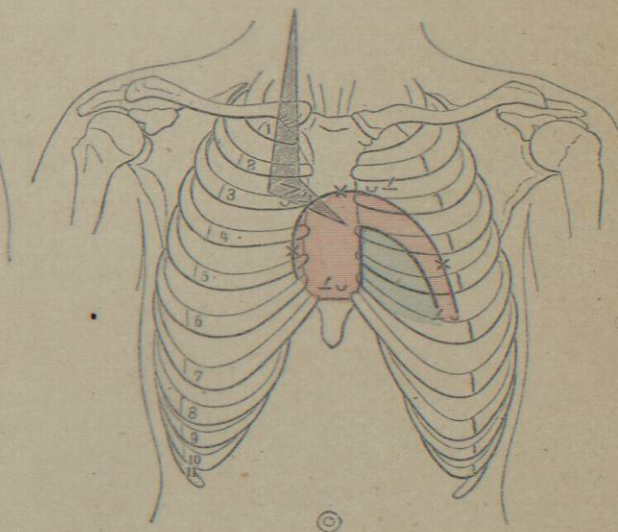


FIG. 4.

REPRESENTATION OF THE PHYSICAL SIGNS FOUND IN THE FOUR
MOST COMMON VALVULAR LESIONS OF THE HEART

From Sahl's "Lehrbuch der klinischen Untersuchungs-Methoden," etc.

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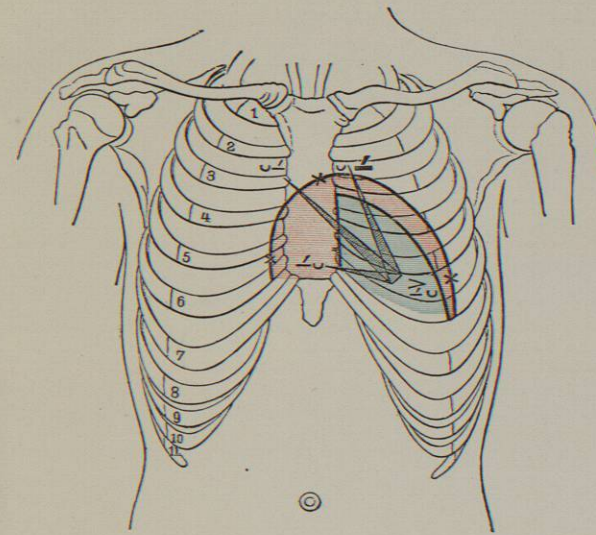


FIG. 1.

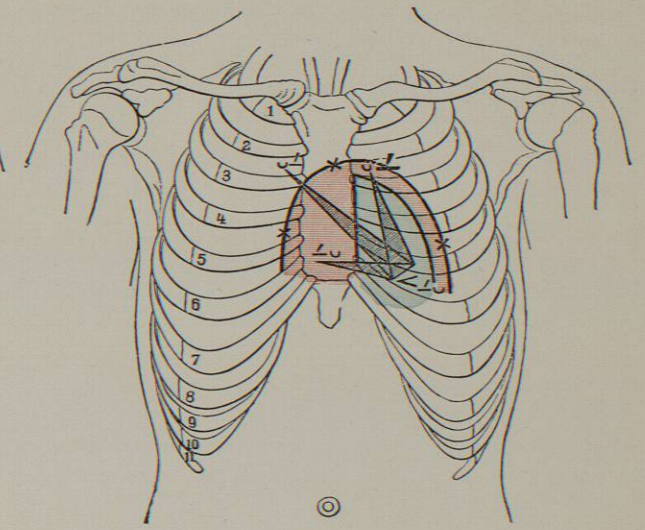


FIG. 2.

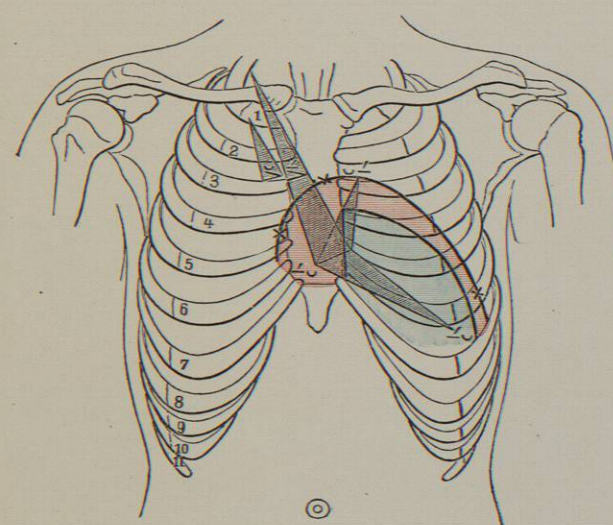


FIG. 3.

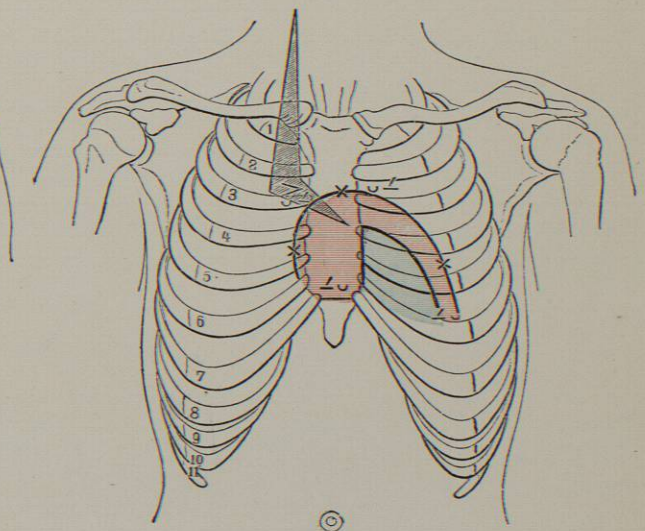


FIG. 4.

GRAPHIC REPRESENTATION OF THE PHYSICAL SIGNS FOUND IN THE FOUR MOST COMMON VALVULAR LESIONS OF THE HEART

From Sahli's "Lehrbuch der klinischen Untersuchungs-Methoden," etc.

compensated. This compensation results from the hypertrophy of the walls of the cavity immediately behind the obstructed orifice.

After the hypertrophy has existed for some time, the heart muscle fails to respond to the extra demand made upon it and becomes weakened; this is followed by a dilatation of the cavity and a failure of compensation.

THE PHYSICAL SIGNS OF HYPERTROPHY OF THE LEFT VENTRICLE (Plate XXII., Fig. 3).—*Inspection*.—Bulging of præcordium, especially in children and adults with thin chest walls; apex displaced downward and to the left of the mid-clavicular line; a heaving impulse over the præcordium.

Palpation.—A slow, heaving, and forcible apex beat. Pulse strong, and tension increased.

Percussion.—Deep cardiac dulness extends more to the left and downward than normal; where the increase in deep cardiac dulness is very great there is probably dilatation with the hypertrophy.

Auscultation.—First sound prolonged; occasionally there is a murmur to be heard, this occurs where the dilatation of the ventricle and auriculo-ventricular orifice causes an incompetent mitral valve. The aortic second sound is usually markedly accentuated; it is clear and ringing, where the cusps of the valves are normal; muffled and duller where atheroma has caused a thickening of the valves. There may also be a reduplicated second sound. In cases of emphysema the physical signs of hypertrophy are not marked; this is due to the voluminous lungs, which lie between the heart and the chest wall, and which interfere with the physical signs elicited by inspection, palpation, and percussion, especially in the latter method of examination, where apparently the area of superficial cardiac dulness is normal. In cases of emphysema where there is no hypertrophy of the heart the cardiac dulness is always diminished.

THE PHYSICAL SIGNS OF HYPERTROPHY OF THE RIGHT VENTRICLE (Plate XXII., Fig. 2).—*Inspection*.—Bulging of the lower part of the præcordium, with pulsation in intercostal spaces to the right of the sternum and in the epigastrium. The apex beat is somewhat displaced to the left by hypertrophy of the right ventricle.

Palpation.—Heaving pulsation and the dislocated apex beat are also detected by this means of examination.

Percussion.—Dulness may extend for an inch or more to the right of the sternum from the enlargement of the right auricle.

Auscultation.—Sounds are not much changed unless there is dilatation. There may be reduplication of the pulmonary second sound.

DILATATION OF THE HEART gives these physical signs: *Inspection* discloses an apex beat, usually to the left of the normal site, and much less visible than in health; it is at times invisible. There is a diffused, undulatory, or wave-like character to the pulsation observed over the præcordium (Plate XXII.).

Palpation shows a feeble impulse of irregular and flopping character. The pulse is irregular, small, of little tension, and rapid.

Percussion dulness extends both to the right and left, depending of course on the portion of the heart most involved by the dilatation.

Auscultation.—The heart sounds are feeble, and the rhythm is irregular. From the relative insufficiency of the valves murmurs may arise. When the dilatation is extreme and the force of the heart's muscular contraction feeble, even though valvular lesions exist, no murmur may be heard. In such cases, after rest and the use of cardiac tonics, the contractions of the heart become more forcible and the murmurs again become audible.

PHYSICAL SIGNS OF PERICARDITIS.—When pericarditis is unaccompanied by effusion of serum, the only physical sign is the friction murmur, the "see-saw" sound, which is heard usually at the base of the heart.

If the inflammation goes on, and an effusion of serum into the pericardial sac takes place, the following signs are noted:

Inspection.—Bulging of the præcordium; apex beat not visible or above the normal location.

Palpation.—No apical impulse, or an impulse felt in the third and fourth left intercostal spaces. Fluctuation may be present, though this is a rare sign.

Percussion.—When fluid is present in moderate amount the area of deep cardiac dulness is not increased, but the change from pulmonary resonance to flatness is sudden and marked. When the pericardial sac is distended with exudate, the dulness or flatness begins at the first or second costal cartilage, and extends downward to the sixth rib, and laterally beyond the normal limits of deep cardiac dulness. The outline of the flat area may be pyramidal and extend beyond the normal site of the apex beat. The sense of resistance on percussion is marked.

Often the dulness of pericardial effusion is at first noted in the second left and fifth right intercostal spaces.

Auscultation.—Friction sounds due to rubbing of the pericardial surfaces on one another may be heard, when the fluid is present in only small amount; when large amounts of fluid fill the pericardial sac, friction sounds are usually absent. The heart sounds are heard faintly and apparently at a distance, but when no endocardial murmurs exist they are normal in character.

The difficulty of differentiating between a dilated heart and a pericardial sac filled with fluid is often difficult. The fact that the apex impulse is absent or displaced upward, and not of the undulating character so typical of a dilated heart, in which also the apex beat is usually displaced downward and outward; the shape of the dull area, pyramidal in pericarditis, and square in a dilated heart; the muffled character of the sound in pericarditis, and the accentuated valvular sounds in dilatation; Bamberger's sign, dulness at the angle of scapula, and increased fremitus and bronchial breathing at this point when the patient sits upright, which signs disappear when the patient leans forward, in pericarditis and not in dilated heart, will aid in the differential diagnosis of these conditions.

MITRAL INSUFFICIENCY.—The mitral valve, incompetent, permits regurgitation of blood into the left auricle during systole. This causes an increased amount of blood in the auricle and an increase in the blood pressure of the pulmonary circulation. The auricle becomes primarily dilated and hypertrophied. During each diastole, as a result of the increased amount of blood in the left auricle and of the increased pressure under which this blood is, more blood enters the left ventricle than normal and with greater force; this causes an increase in the capacity of the left ventricle from the yielding of the walls, and then hypertrophy from the endeavor of the left ventricle to empty itself completely during systole.

The increased pressure of the blood in the pulmonary circulation causes hypertrophy and dilatation of the right ventricle—the effort of nature to supply force for the lack of power in the left auricle. When dilatation of the right ventricle ensues, the tricuspid valve becomes incompetent and the blood during systole regurgitates into the right auricle, thence into the ascending and descending vena cavae; pulsation of the veins of the neck and pulsating liver follow.

As long as the hypertrophy of the ventricles is sufficient to overcome the valvular deficiency, just so long will no changes be noted in the character of the pulse, and no subjective symptoms will be observed (Plate XXIII., Fig. 1).

Inspection.—Bulging of præcordium at times; apex beat displaced down and to the left; pulsation of the cervical veins and of the liver in extreme cases.

Palpation.—Impulse displaced, but nothing characteristic; very rarely a thrill at apex. Pulse small and of low tension. If the compensation is failing the pulsations of the liver may be felt.

Percussion.—Area of cardiac dulness increased to left, and also to the right of sternum, often an inch or more.

Auscultation.—At the apex, in the mitral area, a soft systolic murmur is heard, transmitted to the left, to the axilla, and at times heard in back along the internal border

of left scapula. Though the area of maximum intensity is at the apex, the murmur may be heard along the left edge of the sternum, and also at the base of the heart. The pulmonary second sound is accentuated.

When dilatation of the right heart with the accompanying insufficiency of the tricuspid valve has occurred, a tricuspid systolic murmur may be heard in the tricuspid area; at this stage the pulmonary second sound is weakened.

MITRAL STENOSIS.—Mitral valve narrowed and the blood flow from left auricle to ventricle obstructed. The first result of the interference with the passage of blood through the mitral orifice is dilatation and hypertrophy of the left auricle, and an increase in the blood pressure in the pulmonary circulation; then hypertrophy and dilatation of the right side of the heart follow, and engorgement of the systemic venous circulation. So little blood enters the left ventricle during the period of diastole that the cavity is not filled, therefore it neither dilates nor hypertrophies, and is not affected by the changes occurring in the other cavities of the heart. There being little blood in the ventricle, little is forced into the aorta with each systole, hence the pulse is small in size (Plate XXIII, Fig. 2).

Inspection.—Bulging of præcordium, especially of sternum and ribs to the right of sternum; apex beat not displaced, usually visible. Epigastric pulsation marked.

Palpation.—The apical impulse is short and snapping, often accompanied by a presystolic thrill. Pulse is small; may be regular if compensation is good, irregular when compensation is failing.

Percussion.—Area of cardiac dulness is increased to right of sternum and upward.

Auscultation.—Presystolic murmur heard at or just within the location of apex beat, over a limited area, rough and harsh in character, not transmitted, and ending suddenly with the first sound of the heart. The pulmonary second sound is usually accentuated. There is often a reduplication of the second sound at the base. At the apex the second sound may be inaudible.

When compensation has failed this lesion may exist, and yet no murmur be heard.

AORTIC INSUFFICIENCY.—The aortic valve is incompetent, and allows blood to regurgitate into left ventricle during the period of diastole. The first result of this lesion is, that during diastole the cavity of the left ventricle is overdistended with blood, flowing from the auricle through the mitral orifice and from the aorta through the incompetent aortic orifice. The ventricular walls yield to the pressure, and a primary dilatation results; this is followed by hypertrophy of the ventricle in the effort to force the increased amount of blood contained in the cavity into the aorta. It not infrequently happens that from the dilatation of the ventricle there is an incomplete closure of the mitral valve, the so-called relative mitral insufficiency, which acts in a beneficial way by allowing regurgitation and so relieving the pressure in the ventricle during systole. Aortic regurgitation produces a marked effect on the pulse. The more than normal quantity of blood forced into the aorta during each systole causes a sudden and marked filling of the arteries, a quick and full pulse; this as quickly disappears during diastole, when the arteries are emptying themselves in the normal manner, and also backward through the incompetent aortic valve. The pulse seems to collapse; it is the "water-hammer" or Corrigan's pulse, and is characteristic of this lesion (Plate XXIII, Fig. 3).

Inspection.—There may be bulging of the præcordium; the apex beat is dislocated downward and to the left, and the impulse is usually marked and of the heaving character of hypertrophy.

There is marked visible pulsation in the cervical vessels and also in the temporal, brachial, radial, and other arteries. Capillary pulsation in the finger nails is visible at times.

Palpation.—The abnormal location of apex beat and the forcible and heaving character of the impulse are easily made out. There may be a thrill in the aortic area

diastolic in time. The pulse, the characteristic Corrigan or "water-hammer," is not marked when compensation fails, or when a marked stenosis of the aortic valve exists with the insufficiency.

Percussion.—Cardiac dulness increased to the left from hypertrophy of the left ventricle.

Auscultation.—Diastolic murmur heard over the aortic area, and transmitted across the sternum and downward along left edge to the tip of the ensiform cartilage. This is usually a soft and blowing murmur coming with or replacing the second sound of the heart.

A systolic aortic murmur is not an uncommon accompaniment of the diastolic murmur; and a mitral systolic murmur is also often heard, the result of the relative mitral insufficiency.

AORTIC STENOSIS.—The aortic orifice is narrowed, and an obstruction is thus offered to the passage of the blood from the left ventricle into the aorta. This causes an increase of blood pressure in the ventricle during systole; the ventricular walls at first give way to this increase of pressure and a primary dilatation results. This is rapidly compensated by hypertrophy of the left ventricular walls, which takes place as the result of the heart's effort to empty the ventricle of the excess of blood through the narrowed orifice. The pulse is usually small, because of the small amount of blood forced into the aorta with each contraction of the heart, and regular. The tension is usually high (Plate XXIII, Fig. 4).

Inspection.—Apex beat displaced downward and somewhat to the left, visible and somewhat heaving. When compensation fails impulse is wave-like. There is no visible pulsation in any of the peripheral vessels.

Palpation.—Apex beat palpable in sixth space and to left of the mammary line; impulse is slow, regular, and forcible. There is often a systolic thrill in the aortic area. The pulse is regular, small, and of high tension.

Percussion.—Area of cardiac dulness increased to left from hypertrophy and dilatation of the left ventricle.

Auscultation.—In the aortic area a loud systolic murmur is heard, often audible over the whole præcordium and in the vessels of the neck. It may even be heard in the second, third, and fourth left intercostal spaces near the vertebral column. The murmur is systolic in time and usually very harsh in quality; it is transmitted up the vessels of the neck. The second sound is usually faint, it may be absent; or there may be a diastolic murmur replacing the second sound, due to an incompetent condition of the aortic valve.

Murmurs occurring at the same time of the cardiac cycle arising from the same pathological conditions of the valves of the right heart may be heard, and the physical signs resulting from these valvular lesions are much the same as those already enumerated. Lesions of the tricuspid and pulmonary valves are, however, comparatively rare; and the murmurs heard indicating trouble at these orifices arise more commonly from the relative insufficiency of these valves, which is the result of organic lesions of the valves of the left side of the heart, than from structural lesions of these valves themselves.

TRICUSPID REGURGITATION.—Of the lesions at the tricuspid orifice regurgitation is the more common, and is usually the result of dilatation secondary to mitral disease and consequent stasis of the pulmonary circulation.

Inspection.—Pulsation in epigastrium, in intercostal spaces to right of sternum, and in the vessels of the neck.

Palpation.—Pulsation in epigastrium and to the right of the sternum, and at times the pulsating of the liver may be felt.

Percussion.—Heart dulness increased to the right edge of the sternum or beyond it, and upward, from the hypertrophy and dilatation of the right ventricle and auricle.

Auscultation.—In the tricuspid area, at the end of the sternum and in the fourth and fifth left intercostal spaces near the sternum, a soft blowing systolic murmur is heard; it may be transmitted slightly to the right, but is not heard at the apex. The second sound in the pulmonary area is weak.

TRICUSPID STENOSIS.—This lesion is usually con-

genital and is accompanied by dilatation of the right auricle.

Inspection.—Cyanosis is marked, and visible pulsation may be noted to the right of sternum.

Palpation.—The pulsation and at times a presystolic thrill to the right of the sternum may be felt.

Percussion.—Cardiac dulness, from the dilated right auricle, increased to right of sternum.

Auscultation.—Presystolic murmur, harsh in quality, of maximum intensity in tricuspid area, and not transmitted.

PULMONARY REGURGITATION.—The physical signs are those due to the regurgitation of blood into the right ventricle causing it to dilate and hypertrophy. The murmur is like that of aortic insufficiency, diastolic in time and soft in quality; it is heard with maximum intensity in the second left intercostal space, and is transmitted down the sternum. The pulse alone makes it possible to differentiate the murmur from that due to aortic insufficiency.

PULMONARY STENOSIS.—This lesion, usually congenital, causes hypertrophy of the right ventricle, with the usual train of physical signs.

The murmur is systolic in time, harsh in quality, heard loudest in the second left intercostal space and at times all over the præcordium; a thrill may also be detected in the pulmonary area. The sound is not transmitted up the vessels of the neck, like the systolic murmur of aortic stenosis.

FUNCTIONAL MURMURS.—Functional murmurs are those which occur not as the result of any organic valvular lesion, but from functional changes in the heart, vessels, or blood. These murmurs are often spoken of as inorganic, hæmic, or anæmic, from the fancied cause of their production. It is usual to find these murmurs in cases of anæmia, or in the debility following any exhausting disease.

The following characteristics of functional murmurs will aid in differentiating them from organic murmurs. They are always systolic in time, and are as a rule heard loudest in the pulmonary area, though they may be heard at the apex, and in the aortic and tricuspid areas. The murmur is soft and blowing, and usually louder when the patient is in the recumbent position. There is no transmission, and usually no hypertrophy or dilatation. The second sound in anæmic murmurs is usually somewhat accentuated.

There may be vascular murmurs associated with the functional cardiac murmurs; the most common is that heard in cases of anæmia in the neck over the jugular veins: the so-called "venous hum," or "bruit du diable." This sound may be produced by pressure on the veins with the bell of the stethoscope in persons who are in perfect health.

ANEURISM OF THE THORACIC AORTA.—Aneurism of the arch of the aorta may be fusiform or sacculated, and is usually secondary to syphilis, alcohol, gout, or great muscular strain. The physical signs depend on the location of the aneurismal tumor, the presence of the tumor, and the pressure the tumor exerts on the surrounding structures.

The physical signs due to the tumor itself are pulsation, usually expansile, thrill, dulness, and murmur. It is quite possible, however, for an aneurism to exist without giving any physical signs.

Inspection.—If the aneurism is of the ascending arch, there is often bulging in the first and second right intercostal spaces, and here also a pulsation may be visible. When the aneurism is located in the transverse arch of the aorta, the manubrium is pushed forward and the tumor shows itself in this location; the pulsation is noticed here, and also in the suprasternal notch. Aneurism of the descending arch is usually accompanied by a tumor in the second left intercostal space in front, or in the third, fourth and fifth intercostal spaces of the left inter-scapular region.

The use of the x-ray in examining patients in whom aneurism is suspected is of great assistance. By means of the fluoroscope the presence of a dark and pulsating

shadow, larger than that seen in examining the normal heart, is made out, often when no other physical signs of aneurism can be detected. It is most important to make use of this means of examination in all cases of suspected aneurism.

On inspection also the apex beat of the heart may be found dislocated downward and to the left.

Palpation.—At the point of bulging, pulsation, usually expansile in character, may be noted, and a systolic thrill may sometimes be felt. When the aneurism is of the transverse or upper part of the descending aorta, tracheal tugging may be present. To obtain this sign, the head of the patient, who sits, should be supported against the body of the observer, who stands behind the patient; the observer then places the first or second finger of each hand on either side of the cricoid cartilage. The head should be slightly bent forward and the patient told to stop breathing. With each systole of the heart the fingers appreciate a distinct tug transmitted to them through the trachea and cricoid cartilage, which are dragged down by the expansion of the aneurism upon the left bronchus.

A difference in the character, time, and force of the pulse in the two wrists may be noted; the vessels receiving their blood supply from the aneurismal sac having a weak and retarded pulse wave.

Percussion.—There is dulness over the location of the tumor. When there is no visible tumor, dulness in the second right intercostal space or in the left interscapular region near the vertebral column is suggestive of aneurism.

Auscultatory percussion is of much value in diagnosis of the presence of a tumor in the mediastinum.

The heart dulness is usually not increased unless there is valvular disease, usually incompetence of the aortic orifice, associated with the aneurism.

Auscultation.—There may be a systolic or a systolic and diastolic murmur heard over the tumor. In a large number of cases, however, no murmur can be made out. The second aortic sound is accentuated; at times the closure of the valves is so forcible that the palpating hand can feel the shock.

Pressure Symptoms.—An aneurism may exist and give no physical signs, yet characteristic pressure symptoms may be present. The symptoms caused by pressure often coexist with the physical signs due to the tumor, and depend largely on the location of the tumor and the structures upon which the pressure is exerted.

Pain is usually a constant symptom, sharp and stabbing in character, and may occur in paroxysms. The pain may be due to the erosion of bone, sternum, or vertebra; may be anginal in nature, or result from pressure on the nerves, and shoot down the arm to the fingers or along the intercostal spaces.

Pressure on trachea and bronchi gives rise to cough, bronchorrhœa, and hemorrhage, at times slight and apparently from the lungs, at times profuse and fatal from ulceration of the aneurismal sac and rupture into the trachea or bronchus.

Pressure on vena cava, if on superior, causes cyanosis, enlargement of the veins, and œdema of the head, neck, and arms, usually the right; if on the inferior, there may be œdema of the thorax and feet.

Pressure on the œsophagus causes dysphagia, and the aneurism at times ruptures into the œsophagus. Pressure on the recurrent laryngeal nerves produces a dry metallic cough and aphonia. The paralysis of the abductor muscles of the larynx is easily made out by laryngoscopic examination. The left vocal cord is the one most frequently paralyzed. Pressure on the sympathetic nerves may produce contraction of one pupil, and flushing and sweating of one side of the face. Pressure on the brachial plexus, sternum, and vertebra produces pain.

William K. Draper.

CHESTNUT.—*Castanea*. "The leaves of *Castanea dentata* (Marshall) Borekh. (fam. *Fagaceæ*), collected in September or October, while still green" (U. S. P.). This

is one of the largest and most valuable of our timber trees, growing rather rapidly, and producing an abundance of straight-grained, rather coarse, but very durable wood. The ripe fruit or nut is well known. The official description is as follows: "From six to ten inches (15 to 25 cm.) long, about two inches (5 cm.) wide, petiolate, oblong-lanceolate, acuminate, mucronate, feather-veined, sinuate-serrate, smooth, odor slight, taste somewhat astringent." Doubtless other species of chestnut leaves have the same composition and might with equal propriety be used. Nothing peculiar has been found among the constituents of chestnut leaves; nine per cent. of tannin, resin, and a number of mineral compounds in the ash, are the principal things observed.

Their use is entirely empirical. The leaves for a good many years have had a popular reputation for the relief of whooping-cough, and within the last ten or fifteen years have been considerably used in its treatment by physicians; their value for this purpose is, to say the least, uncertain. Sometimes there appears to be a marked decrease in the number and severity of the coughing spells; at others no effect is produced. They are not put to any other use. The fluid extract is official, the dose being 2 to 8 c.c. (fl. 3 ss.-ij.).

W. P. Bolles.

CHEWSTICK.—The stems of *Gouania Domíngensis* (fam. *Rhamnaceae*). This is a beautiful woody climber, growing both wild and cultivated in the West Indies, and other parts of tropical America, whose stems are used there as tooth-brush and powder combined. These stems are very tough and fibrous, and when cut in shortish pieces the ends are chewed until a rude, stiff brush is formed, with which the teeth are rubbed; a pleasant saponaceous froth of an aromatic bitter taste is formed in the operation, and the teeth are said to be whitened and the gums hardened by it. A tincture and powder are proposed as dental remedies. Internally, it acts as a mild aromatic bitter, and is used in its home as a constituent of small beers. Manufacturing houses offer a fluid extract, the dose of which is 4 to 8 c.c. (fl. 3 i.-ij.).

Henry H. Rusby.

CHEYNE-STOKES RESPIRATORY PHENOMENON.
See *Dyspnoea* and *Respiration*.

CHICAGO, ILL.—A city of a million and a half or more inhabitants, situated upon the west shore of Lake Michigan. Its climate, although a very variable one and subject to sudden changes, with excessive heat or cold and increased humidity, is not an unwholesome one; and the death rate from consumption along the west shore of the lake is less than farther inland. According to Dr. John A. Robinson* the physiological effect of the lake climate is to promote physical activity and mental vigor, and to increase bodily nutrition. "Persons," he says, "who have been predisposed to pulmonary tuberculosis have enjoyed robust health in this climate so long as they have avoided its bad features and observed other precautions." The favorable features of the climate, as Dr. Robinson gives them, are: first, air in motion, the winds sweeping down into the dark corners of the streets and alleys, and whirling the filth into the highways where the rain and sunshine disinfect it; these winds act as great atmospheric purifiers. Second, the lake purifies the air as it blows from its surface toward the land. Third, the large amount of sunshine. "Observations for several years," continues Dr. Robinson, "prove that the monthly mean of cloudy days is about ten a month; which means that the sunshine is present about two-thirds of the time." From the accompanying climatic table it will be seen also that the number of clear and fair days is two hundred and fifty-seven a year.

*North American Practitioner, Chicago, 1897, ix., pp. 296-298, "Chicago as a Health Resort."

CLIMATE OF CHICAGO, ILL.—LATITUDE, 41° 52'; LONGITUDE, 87° 38'.
PERIOD OF OBSERVATION, THIRTEEN YEARS.

Data.	January.	April.	July.	Year.
Temperature (Fahr.)—				
Average or normal.....	25.8°	45.4°	72.3°	48.8°
Average daily range.....	14.9	14.3	14.3	
Mean of warmest.....	32.6	54	80.1	
Mean of coldest.....	17.7	39.7	65.8	
Highest or maximum.....	65	83	99	
Lowest or minimum.....	-20	17	50	
Humidity—				
Average or relative.....	76%	66.5%	70.6%	70.8%
Precipitation—				
Average rainfall in inches.....	2.04	3.65	3.96	37.58
Wind—				
Prevailing direction.....	S.W.	N.	S.W.	S.W.
Average hourly velocity in miles.....	9	9.5	7.1	8.4
Weather—				
Average number of clear days.....	7.8	8.1	12.9	108.5
Average number of fair days.....	12.9	12.2	12.5	148.6
Average number of clear and fair days.....	20.7	20.3	25.4	257.1

The authority above quoted does not think the Chicago climate contraindicates the establishment of a sanatorium, in the vicinity, for the treatment of curable cases of consumption. "At any rate," he says, "the climate in the lake region affords as good an opportunity as the climates of England and New England." For a statistical account of the Chicago climate one is referred to "The Climate of Chicago," by Professor Hazen, 1893, of the Weather Bureau, published by the United States Government.

Edward O. Otis.

CHICHANCANAB.—Yucatan, Mexico. The water of this lake is perfectly clear and very bitter in taste. It deposits crystals similar in appearance to those of magnesium sulphate.

N. J. Ponce de León.

CHICHIMEQUILLAS.—Querétaro, Mexico. Nothing much is known of these waters. The laity recommends them in cases of rheumatism, leprosy, and disorders of menstruation.

N. J. Ponce de León.

CHICHIPICO.—Puebla, Mexico. This is a lukewarm-sulphureted calcic water. Although there are no bathing facilities at this spring, many people take the baths, as they are highly recommended by local physicians, for the treatment of rheumatism and nervous disorders.

N. J. Ponce de León.

CHICKENPOX.—(Synonyms: *Varicella*, Crystalli, Swinepox; Fr., *La Varicelle*; Ger., *Wasserpocken*.) Chickenpox is an acute, specific, infectious fever, characterized by successive crops of vesicles distributed over the entire surface of the body, which disappear, in from four to seven days, by desiccation. It is the mildest and least important of the eruptive fevers.

The belief, formerly generally entertained by the profession, that varicella is not an independent affection but a modified variola, is now abandoned, save by a few clinicians who follow the teaching of Kaposi and the Vienna school. The proof of the non-identity of the two diseases is overwhelming.

Varicella, like the other members of the exanthematic group, is due to a specific virus, or poison, the nature of which is unknown. It is pre-eminently a disease of early life. It affects babes at the breast, attains its maximum frequency about the fifth year, and is rarely met with after the tenth year of age. It rarely occurs a second time in the same individual. Adults enjoy special immunity from the disease, even when unprotected by an attack in childhood.

Sporadic cases of chickenpox are sometimes observed, but it usually prevails as an epidemic. It is highly contagious, and few children who are susceptible to its influence escape when exposed. Many authors affirm that inoculation with the contents of the vesicles yields nega-

tive results, but Steiner and others have repeatedly reproduced the disease in this way. The period of incubation in these experimental cases is about eight days, but when the disease is transmitted in the ordinary manner it is longer and more variable, running from ten to seventeen days.

Prodromal symptoms are not infrequently wholly absent, the appearance of the eruption giving the first indication that the child is ailing. When present, they rarely last longer than twenty-four hours, and are such as usher in mild febrile attacks, namely, anorexia, lassitude, general bodily discomfort, chilliness, and slight elevation of temperature.

The initial fever is mild, seldom measuring more than 101° F., and the constitutional disturbances are correspondingly slight, but in exceptional cases they may be as severe as those which commonly attend mild attacks of the other eruptive diseases. The eruption follows promptly on the first increase in temperature, and in a few hours attains its full development. Small hyperemic patches resembling roseola spots first appear and are speedily followed by vesicles. When fully formed, the eruption consists of perfectly transparent vesicles, more or less abundantly scattered over the body, globular or ovoid in form, and varying in size from a pinhead to a split pea, or even larger. They are unicellular in structure, collapse when pricked, and leave behind no swelling or elevation of the skin. A distinct areola may or may not be present.

The wall of the vesicle, formed by the outer layer of the epidermis, is very thin and easily broken.

When the eruption is abundant the body, as well described by Dr. Gregory, presents the appearance of having been exposed to a momentary shower of boiling water, each drop of which has produced a small blister.

The eruption appears first upon the trunk, and spreads irregularly over the entire body. It is most abundant upon the back and breast, and least so upon the face, where it is usually limited to the forehead. The scalp nearly always exhibits a full crop of eruptions, which, protected by the hair, maintains its physical integrity longer than in any other location, and thus renders valuable aid in diagnosis. The eruption is never confluent.

The occurrence of two, three, or more successive crops of eruption, each running an independent course, constitutes a striking and unique feature of varicella. Between the vesicles first formed new roseola spots appear, and soon ripen into fully developed vesicles. Thus, newly formed vesicles may be seen side by side with others in all stages of development, even to advanced desiccation. The irregularity in the course and development of the eruption is an important point in the diagnosis of the disease.

The mucous membranes are often implicated. The tongue, buccal membrane, and the mucous surfaces of the genital organs, especially in girls, are favorite sites for the formation of vesicles. In these locations the vesicles soon lose their epithelial covering, and leave small, round, superficial ulcers resembling the ulcers of herpetic stomatitis.

If unbroken by accident or by the scratching of the child to relieve the itching so generally present, the vesicles remain until the third day without change, when their contents become cloudy and desiccation begins.

At this stage a few scattered pustules may be observed, but these are purely accidental and not essential features of the disease. The vesicles begin to dry up in the centre and form thin, brownish-yellow crusts, which soon become detached. Faint red spots remain, which pass away in a few days, and carry with them every trace of the eruption; but very exceptionally depressed, slightly pitted cicatrices permanently mark the seat of a few of the vesicles.

Mr. Hutchinson has called attention to the gangrenous ulcers which sometimes, though rarely, complicate chickenpox in feeble, ill-nourished infants. In these cases a greater or less number of vesicles, instead of pursuing the ordinary benign course, become gangrenous,

increase in size, and form black scabs of one-half to one inch in diameter, surrounded by dusky red areole. The ulcers heal slowly. In fact this condition may result fatally in infants whose constitutions are depraved by inherited taints or bad surroundings. It is not peculiar to varicella and is described on other pages of the Handbook under the name of *Varicella Gangrenosa*.

The varieties of chickenpox described by authors under the names of *Varicella lenticularis*, *Varicella conoides*, and *Varicella globata*, based on the various shapes assumed by the eruption, may be wholly ignored, since in every well-marked case vesicles answering all of these descriptions are abundantly found. In fact this variability in size and form of the typical varicellar eruption is a characteristic feature of the disease. The prognosis is always favorable.

Erysipelas is the most serious, though a rare complication. Holt has met with three fatal cases.

Henoch and others have reported cases of nephritis occurring both as complications and as sequels. Varicella is not infrequently complicated by other infectious fevers. The combination of scarlatina and varicella has been often observed.

Varicella derives its chief importance from the liability of inexperienced or careless diagnosticians to mistake it for smallpox, or *vice versa*.

In variola, or well-marked varioloid, the physiognomy is so distinctive as almost to preclude the possibility of error. But in exceptional cases of varioloid the constitutional symptoms are so mild and the eruption so rudimentary and irregular that a careless examination will not suffice to distinguish them from the graver forms of varicella.

For two years or more an unusually mild form of variola has prevailed extensively throughout the country, especially in the South and middle West. The mortality has been almost nil. In 2,819 cases recorded in Ohio up to January, 1900, the death rate was 1.4 per cent. During most of the time varicella has been epidemic in a part of the same territory, which with the exceedingly mild type of variola has given rise to much confusion and many mistakes in diagnosis.

Time will always clear up the diagnosis, but in the meanwhile the reputation of the physician and the safety of the community may be seriously compromised.

The absence of prodromal manifestations, the short initial fever, the rapidity and irregularity with which the eruption spreads over the body, the globular, non-umbilicated, transparent, unicellular vesicles, the absence of a distinct pustular stage, and the successive crops of eruption, which show roseola spots, vesicles, and crusts in close proximity, will rarely give room to hesitate in the presence of chickenpox.

While any case of varicella may present an occasional vesicle slightly umbilicated or with purulent contents, due to accidental causes, the fact that this appearance is only exhibited by a few scattered vesicles, and is not the predominating character of the eruption, will suffice to establish the diagnosis.

It is well to bear in mind that a vesicular eruption which occurs in a child over ten or twelve years of age, and especially in an adult, is open to grave suspicion. The writer cannot, however, agree with those authors, by no means few in number, who maintain that varicella never occurs in the adult. He can recall three cases in adults, all females, which have come under his observation.

Varicella is a self-limited disease and needs but little treatment.

Light diet, cooling drinks, a gentle aperient, and confinement within doors while the fever lasts, is all that will ordinarily be required. To prevent the infection of other children isolation should be maintained until the crusts have fallen.

W. J. Conklin.

CHICK'S SPRINGS.—Greenville County, South Carolina.

Post-Office.—Greenville. Hotel and cottages.
ACCESS.—Via Atlanta and Charlotte Air-Line (Southern