ABSTRACTS
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BALLISTOCARDIOGRAPHY

A recording platform for the measurements of forces in the head-foot, lateral and dorsoventral planes is described which obtains ballistic waves in one simple operation. The head-foot force is transmitted along the axial skeleton and can be inscribed from the table or from the patients' shins. Lateral or front-back forces must be recorded from the thorax since they are not transmitted well to the table. Normally in young people the lateral waves are \( \frac{1}{4} \) to \( \frac{1}{2} \) as great as the head-foot deflections. The lateral tracings revealed that, in many cases, a decrease in the head-foot systolic waves is parallel by an increase in the lateral waves. This indicates that the direction, but not the force, of ejection is changing. Tortuosity of the aorta appears to be the major factor resulting in a large lateral with a small head-foot wave. The lateral ballistocardiogram reveals large diastolic waves due to gallop phenomenon or auricular systole, not apparent in the classical tracing. The effects of respiration, drugs, and various types of heart disease on the combined tracings are presented.

SHUMAN


The immediate effect of smoking regular and low-nicotine filtered cigarettes was studied in 14 young males. Cardiac outputs (ballistocardiogram), pulse rates (electrocardiogram) and skin temperatures (thermocouple) were determined. The results indicated that although smoking constricted peripheral vessels, causing increase in heart rate and fall in skin temperature, the effect was not strong enough to change the form of the ballistocardiogram or affect the cardiac output, except in cases of individual susceptibility or sensitivity.

BACTERIAL ENDOCARDITIS

A boy aged 3 years with an interventricular septal defect complicated by subacute bacterial endocarditis due to a Penicillin resistant staphylococcus aureus is described. Massive doses of Penicillin, 30,000,000 to 60,000,000 units intravenously, together with 0.25 gm. of Streptomycin intramuscularly daily seemed to have no appreciable effect during the first five days of treatment. Improvement did appear when Erythromycin, Oxytetracycline and Streptomycin were given, particularly after diarrhea and incomplete absorption led to intravenous administration of Oxytetracycline and large doses of Erythromycin. Erythromycin was given by constant intravenous infusion in doses of 2 gm. daily through a polyethylene venous catheter with booster doses of 250 mg. intravenously every 8 hours together with 1 gm. of Oxytetracycline intravenously daily. These drugs were given for 10 weeks, although intravenously for only two weeks. This is believed to be the largest reported quantity of Erythromycin given intravenously, on the basis of body weight. The organism was inhibited in vitro by concentrations of Penicillin which were exceeded in vivo but
there was no clinical response to this drug. Furthermore, the organism was cultured when the patient was receiving moderate doses of Erythromycin, a drug which proved beneficial in much larger doses. The experience in this case is felt to suggest a synergistic effect of other antibiotic agents with Erythromycin.

Rosenbaum

BLOOD COAGULATION


Variations in technic of obtaining the sample of blood and in measuring the rate of coagulation are only partly responsible for the variability of the whole blood clotting times. Some of the variability is due to the in vivo effect of exogenous and endogenous factors affecting the circulating blood. With a standard technic the rate of clotting of whole blood is remarkably constant in the same individual on the same day or on different days, if the individual is studied under conditions which keep the variability of endogenous and exogenous factors at a minimum. The basal state is the best condition in which to study the rate of clotting of whole blood because the variations in endogenous and exogenous factors are at a minimum.

Ingested fat in the form of cream or butter accelerates the rate of coagulation of whole blood. The response is detectable in one-half hour after ingesting the fat and reaches a maximum in one hour. Thereafter, the effect progressively diminishes. This results in a constant and characteristic biphasic curve of response. The accumulation of thrombin on glass does not explain this phenomenon. Evidence is presented that adequate washing in running water and saline permits the reuse of a syringe without influencing the results. Sterilization of syringes, pipettes and test tubes used in the measurements of the rate of blood coagulation is unnecessary.

Harris


Washed human erythrocytes were hemolyzed in the absence of platelets and were found to produce a clotting factor in the hemolsate, causing a high consumption of prothrombin when added to normal plasma. The prolonged prothrombin time of serum obtained after clotting of the human plasma was shown to be due to a decrease in prothrombin and not to a lack of proconvertin. The erythrocyte hemolsate was inactive when added to hemophilic plasma indicating that it requires thromboplastinogen for its clotting action. In very mild hemophilia, the escape of this clotting factor from erythrocytes may bring the consumption of prothrombin time into the normal range. The prothrombin consumption test has been shown to be more reliable when carried out on platelet-rich plasma than on whole blood. The pressure of the erythrocyte clotting factor is believed to be the explanation for the poor results obtained with this test as applied to whole blood in mild hemophiliacs. The physiological significance of this newly-found clotting factor remains to be determined.

Shuman


Intravenous warfarin sodium induced therapeutic hypoprothrombinemia safely and effectively in 20 patients. Warfarin or warfarin sodium orally induced an effective hypoprothrombinemia in 16 patients, with a similar time of onset and duration. The initial dose for either drug was 1 mg. per kilogram of body weight; however, the authors now conclude that an initial dose should not exceed 75 mg., regardless of body weight. There would appear to be no advantage to use of warfarin sodium intravenously rather than warfarin or warfarin sodium orally, except when the patient is vomiting or cannot otherwise tolerate oral medication.

Maintenance of therapeutic hypoprothrombinemia was accomplished with ease in 21 patients by using warfarin or warfarin sodium orally. Warfarin appears to have no advantage over warfarin sodium. As with other 4-hydroxycoumarin compounds, microscopic hematuria is occasionally seen as a toxic manifestation, and one must watch for this as well as other evidences of hemorrhage. Vitamin K₁ is a very effective antidote against hypoprothrombinemia induced by warfarin sodium and warfarin.

Bernstein

CONGENITAL ANOMALIES


The authors report a series of 14 cases presenting pulmonary stenosis of mild or moderate degree with little or no increase in right atrial or right ventricular diastolic pressure, associated with atrial septal defect, ventricular septal defect, or transposed pulmonary veins permitting a left to right shunt. The clinical features were generally those of mild or moderate pulmonary stenosis with electrocardiographic or radiologic findings suggestive of an accompanying septal defect. The signs of dynamically severe stenosis—cardiac enlargement, precordial heave, pure second sound, prominent "a" wave in the neck, hepatic pulsation and small volume arterial pulses—were usually absent. The electrocardiogram frequently showed a right bundle
branch block pattern slightly favoring the presence of a septal defect. Radiologically, dilatation of the pulmonary artery segment was in keeping with a valvular pulmonary stenosis, while the evidence of an increased pulmonary blood flow pointed to a left to right shunt. Clinical differentiation between the different types of shunt was not especially sought but a low murmur and thrill would appear to favor the presence of a ventricular septal defect. In all eight cases of pulmonary stenosis and atrial septal defect fluoroscopic examination of the site of pressure change and the appearance of the records suggested that the stenosis was valvular in all cases. The stenosis was always mild or moderate with a right ventricular systolic pressure well below 100 mm. Hg and a normal or even slightly elevated pulmonary artery pressure. The right atrial pressure was normal in all cases, averaging 2.5 mm. Hg. Measurement of left atrial pressure in five cases indicated that the pressure gradient across the atrial defect necessary to maintain an over-all left to right shunt was present.

The question of the inadvisability of pulmonary valvulotomy in these cases is discussed.

HARRIS


Pulmonary arterial hypertension of sufficient magnitude to cause shunting of venous blood from the pulmonary artery into the aorta (mainly the descending portion) is the underlying basis for the physiologic and clinical features in four newly investigated cases of patent ductus arteriosus with reversal of flow, and twelve cases selected from the literature. The pulmonary hypertension is related to extensive arteriosclerotic and thrombotic alterations in the medium and small-sized pulmonary arteries.

Clinical diagnosis of patent ductus arteriosus with reversal of flow is made by the discovery of cyanosis and clubbing of the toes and absent or less pronounced cyanosis and clubbing of the fingers. Right ventricular hypertrophy is also present roentgenologically and electrocardiographically. Angiocardiography and cardiac catheterization establish the diagnosis unequivocally, are of aid in excluding coexisting defects and provide information needed in decisions concerning ligation of the ductus. Limited surgical experience indicates that ligation of the ductus is hazardous but may be followed by considerable decrease in the pulmonary hypertension.

The usual clinical characteristics of uncomplicated patent ductus arteriosus are absent; the continuous murmur is not heard; and the pulmonary blood flow is small. Patients demonstrating the syndrome of patent ductus arteriosus with reversal of flow (shunting of blood from the pulmonary artery to aorta of sufficient magnitude to cause cyanosis) are not necessarily in cardiac failure and may live for many years after its onset.

HARRIS


The authors described a new approach to the treatment of inter-atrial septal defects which was used in 12 cases, with 10 survivals. The procedure consisted of introducing a big, curved needle at the base of the aorta, which was guided in the septal rim down through the upper portion of the interventricular septum and out behind the aorta. The sutures were then drawn taut over a piece of muscle from the chest wall to avoid their cutting through the thin atrial wall in the dissected groove.

ABRAMSON


This report is concerned with 20 cases of endocardial fibroelastosis found in a series of 10,000 autopsies at the Massachusetts General Hospital since 1930. Four cases were infants, aged 2 years or less, four patients were children aged 5 to 11 years, and the remaining 12 cases ranged in age from 16 to 71 years. The infantile group was characterized by marked cardiac hypertrophy, marked generalized fibroelastic proliferation of the endocardium overlying normal myocardium in most areas and only minimal, spotty myocardial fibrosis, when present. The foramen ovale was closed in all cases and these authors support the view that this disorder is congenital in origin. The childhood cases were identical with those in the infantile group except that there was less endocardial thickening and less striking hypertrophy; symptoms also appeared at a later age. The childhood cases are also believed to be congenital in origin. The adult cases showed fibroelastic endocardial thickening which was qualitatively identical with that in childhood, in some as severe and in others less severe and more patchy in extent. When the clinical picture in the adults was contrasted with that in children it was found that the average duration of symptoms was much longer, congestive failure was more prominent, mural thrombi were present in three-quarters of the patients and embolization was very frequent. A familial history of fatal heart disease was also common. The adult cases are also felt to be, in all probability, congenital in origin.

This disorder is differentiated by these authors from Beri-beri, heart disease, myocarditis, East African endomyocardial necrosis and the "Collagen"
diseases. The endocardial fibroelastosis is believed to produce clinical symptoms by (1) endocardial constriction, (2) interference with proper conduction of contraction impulses, or (3) interference with the blood supply of the muscle underlying the involved endocardium with resultant anoxia.

**Rosenbaum**

**Braun, K., Milwidsky, H., Izak, G., and Schor, S.:**


A detailed case report is presented of a 13 year old girl with patent ductus arteriosus associated with marked pulmonary hypertension and intermittent reversal of the shunt. At operation the pulmonary artery pressure dropped from 75/60 mm. Hg to 50/40 mm. Hg when the ductus was occluded. Because of this finding, the ductus was divided. Cardiac catheterization eight months after operation showed that the pulmonary artery pressure was 32/12.5 mm. Hg. The drop in pulmonary pressure was paralleled by marked clinical improvement. The authors believe that in this patient the high pulmonary resistance was related to the blood flow through the patent ductus.

**Weissler**


Procedures for the repair of atrial and ventricular septal defects are described and the results in animals and in several human patients reported. The author believes that the repair of atrial septal defects by the method described have been sufficiently successful to deserve more extensive clinical trial. The repair of ventricular septal defects, although appearing to be technically sound, will require further experience before it can be considered safe and practical.

**Weissler**

**CONGESTIVE HEART FAILURE**


Discussion centers about the medical problems of a fifty year old white male with refractory heart failure whose post-mortem examination disclosed primary amyloidosis of the heart, spleen, adrenals and vessels of the kidneys, liver, pancreas and prostate with cardiomegaly and splenomegaly. A liver punch biopsy led to the correct ante-mortem diagnosis.

Amyloidosis may be classified as primary or secondary types. The secondary type is associated with some underlying disease. Perhaps 80–90 per cent of patients with secondary type of amyloidosis suffer from tuberculosis; the remaining 10–20 per cent of cases occur in association with pyogenic lesions of bones such as osteomyelitis, and suppulsive diseases of the lung.

Primary or systemic amyloidosis is characterized by involvement of blood vessels, particularly the small arteries. In primary cardiac amyloidosis the amyloid deposits are almost entirely localized in the heart. Primary amyloidosis, like the secondary type, affects the liver, spleen and kidneys. Of all the criteria for the diagnosis of primary systemic amyloidosis absence of preexisting or etiologic disease is the only constant clinical and pathologic finding. The usual Congo red test performed over a sixty minute period may be quite inaccurate. It is recommended that this test be performed over 30 minutes and that several values should be determined. The results should then be extrapolated on a semilog curve back to 0. Gingival biopsy may be of value when primary amyloidosis is suspected.

All layers of the heart may be involved, particularly the endocardium. Extensive deposits of amyloid in the mitral and aortic valves may produce significant valvular defects.

**Harris**

**CORONARY ARTERY DISEASE**


The administration of mercurial diuretics has been followed by manifestations of toxicity and occasionally by death. The experiments conducted by the authors compared the direct effects of organic mercurials upon the normal and damaged heart. In addition, blood, skeletal muscle and myocardium samples were obtained before and after mercurial injections for measurement of sodium, potassium and magnesium. The mercurial solution was infused intravenously in a concentration equivalent to 2.6 mg. of mercury per ml. resulting in death in all instances from 25 to 50 minutes after the beginning of the injection. Thirteen dogs were used of which five were subjected to ligation of the anterior branch of the left coronary artery. The electrocardiographic changes and lethal doses were not significantly different in the two groups of dogs. The average values of serum sodium, potassium and magnesium fell in both groups following administration of the mercury. Skeletal muscle potassium and magnesium rose slightly after the mercurial; variations in tissue sodium concentrations were not significant. The data indicate that the effect of the mercurial is independent of the presence and the degree of heart muscle damage; nor was there any correlation between the change in potassium, sodium and magnesium levels and lethal dosage.

**Shuman**

Of 271 cases of acute myocardial infarction seen during a period of 3 years, 122 qualified as "good risks" on the basis of the absence of certain signs of unfavorable prognostic import: previous infarction, intractable pain, severe shock, gallop rhythm, significant cardiac enlargement, arrhythmias and various conditions predisposing to thromboembolism. These "good risk" patients were not given anticoagulant therapy and were placed on a graduated program of activity. Of the 122 patients so treated 6 died during the period of hospitalization, 3 of these deaths occurring within the first 48 hours. Analysis of the causes of death showed that only one might have been prevented by anticoagulant therapy, although, in this case, the cause of death was undetermined. Clinical thromboembolic events occurred in 2 patients in the form of pulmonary embolism; 2 others were presumed to have phlebothrombosis on the basis of calf tenderness.

It is estimated that approximately 30 per cent of the patients with myocardial infarction are candidates for anticoagulant therapy. The prognosis in "good risk" cases is not significantly influenced by such treatment. The incidence of hemorrhage and death due to anticoagulant drugs outweighs the benefits derived from their use in milder cases. The initial clinical appearance of the patient, regardless of his age, is the best index of his future course and the deciding factor regarding the need for anticoagulant therapy.

SHUMAN

ELECTROCARDIOGRAPHY


The authors studied the clinical significance of the finding of an angle between the frontal QRS and T vectors. Among 1558 patients with such an electrocardiogram 171 had a complete bundle branch block, 1006 other associated anomalies in the electrocardiogram, and in 381 the divergence of the two axes was the only alteration. There were 11 subjects with clinically and roentgenologically normal hearts in the first, 73 in the last, and none in the second group. Thus in 80 per cent of the cases in which the angle between QRS and T is more than 60° the chances are that this electrocardiographic anomaly is associated with a clinical anomaly. The remaining 20 per cent present a diagnostic problem.

The following additional data derived from further analysis of the material proved helpful in the evaluation of such electrocardiograms. An angle greater than 100° is invariably abnormal. A lesser degree of divergence with AQRS at +55-120°, and AT deviated in a counterclockwise direction is always abnormal in young persons and suspect in persons over 35 years. On the other hand, AQRS between −40 and +55° and AT deviated in clockwise direction is always abnormal in persons over 35 and suspect in younger ones.

PICK


A mathematical treatment of the dipole field in a bounded space is given for a few simple cases. The potential at the surface is calculated for an open and for a closed cylinder with the dipole on its axis, and for an infinite layer bounded by two parallel planes, the dipole being situated nearer to one plane than to the other. The medium is assumed to be homogeneous. The image surface is calculated and represented in several diagrams. A detailed appendix with the mathematical equations follows the body of the article.

MAXWELL


The data supplied by the various electrocardiographic leads are described briefly. The electrocardiogram can be used for timing waves of other tracings and for evaluating atrial and ventricular rates, for ascertaining position of the heart, and in the field of myocardial and coronary heart disease. The electrocardiogram has limitations and its data should not be unduly stressed in preference to those supplied by other methods of investigation. The electrocardiogram of the aged may present minor changes of the P-R or QRS intervals or of the height of the T wave, slight left axis deviation, and certain changes of rate and rhythm. While a large percentage of apparently normal senile hearts have a normal tracing, about one-fourth present evidence of important abnormalities indicating myocardial damage.

MAXWELL


The authors have made a clinical and serial electrocardiographic study of 12 patients who had experienced 2 sequential myocardial infarctions, anterior in location. Two of the patients were examined at necropsy. It was emphasized that a second anterior infarction following the first anterior lesion produced conventional changes in the serial electrocardiographic tracings. The serial changes resulting from the second infarction were not obscured by the
residual defects of the first infarction remaining in the electrocardiogram. In order to make a diagnosis of the second anterior infarction, it is necessary to observe serial electrocardiographic changes and to have available the clinical and electrocardiographic records of the first infarction. The serial tracings are essential for determining the existence of the old and new lesions. Residual defects in the electrocardiograms were more marked after the second than after the first infarction. It is suggested that second myocardial infarctions in the same area occur much more frequently than recognized.

SHUMAN

ELECTROKYMOGRAPHY


In two patients with pulsus alternans electrokymograms were recorded of both ventricles and various portions of the aorta, in part with simultaneous registration of the sphygmonogram of the carotid artery or pressure curves of the right ventricle and pulmonary artery. The analysis of the data revealed that the variations in aortic pulsations parallel those of the peripheral pulse. In ventricular kymograms the difference between larger and smaller systoles is revealed by different inclination of the systolic component. This alteration is however not always equally pronounced in the two ventricles. In one of the patients paradoxical pulsations were found of the entire left ventricular border varying in extent with the degree of pressure differences between the two types of systoles.

All these findings are interpreted to provide support of the views that pulsus alternans in man is caused primarily by a disorder of contractility of the heart rather than by a disturbance of hemodynamics.

Pick

ENDOCRINE EFFECTS ON CIRCULATION


Comparison of the zona glomerulosa of the adrenals of 54 hypertensive patients who died while on the salt-free rice diet with that of 20 patients who died suddenly without preceding illness, with 13 hypertensive patients on a normal diet, and with 15 malnourished cancer patients, indicates that the width of the zona glomerulosa of the patients on the rice diet was increased significantly in 24 per cent, within normal range in 70 per cent, and insignificantly below the normal range in 6 per cent. Hypertensive rats on a salt-free diet showed a similar marked increase in the width of the zona glomerulosa in comparison to hypertensive rats on diets with normal salt content. Similarly, normal rats on a salt-free diet compared to normal rats on a normal diet showed a marked increase in width of the zona glomerulosa.

The cytoplasmic fat content was decreased in the human adrenals when the width of the zona glomerulosa was greater than normal and was the same as in the controls when the width was in the normal range. Special histochemical staining techniques identified the cytoplasmic fat as ketosteroid in type.

The increased width and decreased fat content of the zona glomerulosa are interpreted as evidence of increased hormone production without storage. It is suggested that this may be due to the decreased sodium-potassium ratio which stimulates the production of electrolyte-regulating corticoids. In regard to the influence of the rice diet on the adrenal cortex, definite corticalatrophy, such as would indicate reduced cortical activity, was not observed in a single instance. No conclusions can be drawn regarding the role of the adrenal cortex in the genesis of hypertension.

HARRIS


Using the rabbit ear chamber technique, measurements were made on the constriction in arterioles caused by nor-epinephrine and histamine in normal and cortisone treated animals. The experiments were well controlled. There was no effect produced by cortisone upon the vasoconstriction brought about by nor-epinephrine or histamine on the arterioles.

Harvey


The combination of cortisone or hydrocortisone administration, in addition to cholesterol feeding, in rabbits, results in a considerable elevation of plasma lipid fractions—definitely higher than those seen on cholesterol feeding alone. Discontinuation of corticosteroid administration but continuation of cholesterol feeding resulted in a return of the lipid level to that of cholesterol feeding alone. Corticotropin (ACTH) was less effective than the steroids.

Atherogenesis and the deposition of cholesterol in other tissues was inhibited by this combination in spite of the extreme hypercholesterolemia. The authors suggest that corticosteroids diminish tissue permeability of lipids.

Waife
HYPTERTENSION


As long as renal function remained adequate as judged by endogenous blood creatinine (and presumably blood urea) chronic stimulation of renal arteries and associated nerves or of the splanchnic nerves caused a hypertension for the duration of the application of the stimulus. Decrease in renal circulation prevented the onset of hypertension due to stimulation. In one dog with renal arteries completely occluded an extensive collateral circulation maintained normal clearance values. Four periods of stimulation produced a hypertension which persisted after stimulation stopped. A change in renal blood supply was implicated in this case.

Oppenheimer


When one kidney is removed and the other compressed with a figure of eight ligature in rats some become hypertensive, but others remain normotensive. Potassium of operated normotensives is increased in brain and muscle although intracellular sodium of muscle is decreased and sodium content of brain is increased when compared to unoperated controls. These changes were present whether or not there was renal insufficiency with increased blood urea nitrogen. The only difference observed in operated hypertensive rats was a significant 2% decrease in brain potassium.

Oppenheimer


In 35 cases with hypertensive heart disease in various clinical stages, the hemodynamics including calculations of the work of the right and left ventricle were compared with similar data of cases with valvular and coronary heart disease. In 15 of the patients a vasodilator (Regitine, Pendiomide or Aprezone) was injected through the cardiac cather into the pulmonary artery, and the effect recorded upon right ventricular pressure, cardiac output and the work of the heart.

The hemodynamics in the various stages of hypertensive heart disease do not differ from those found in other types of cardiopathies involving the left ventricle, and the alterations parallel the clinical manifestations. Left ventricular work, increased in the initial stage, falls to a certain extent with onset of heart failure but remains elevated as heart failure progresses. The work of the right ventricle, on the other hand, was found to increase progressively in the course of the evolution. Under the effect of vasodepressors the work of the right heart remained unchanged regardless of the stage of the disease, whereas left ventricular work was reduced to varying degrees, most so in well-tolerated hypertension, and least in the presence of heart failure. The significance of these data relative to the various factors which cause, or contribute to, the development of heart failure in hypertensive heart disease is discussed.

Pick


The authors summarize briefly their experiences and methods of administration of a number of drugs used in the treatment of hypertension. All the more common hypotensive drugs are briefly introduced, mode of administration discussed and the kind of response to be anticipated covered. This presentation is not concerned with the results of treatment carried out over periods of several months.

As in all methods of medical treatment of hypertension, the proof of effectiveness can be determined only by trial. Predictability of effectiveness of a program of treatment is of a very low order; the physician may need to try various combinations of drugs in varying doses until a satisfactory program is achieved.

They believe that physicians should approach the problem of medical treatment of essential hypertension with optimism, for this attitude coupled with information and skill produces gratifying results on many occasions. One need only recall the intense and prolonged effort devoted to the care of patients with such conditions as leukemia, malignancy and tuberculosis to justify the same devotion to the care of patients with essential hypertension.

Simon


Two rare cases of pre-eclampsia are reported in detail. Both patients had pre-eclampsia and after delivery showed an extremely unusual course in that they progressed rapidly with evidences of malignant hypertension into uremia and death. Acute idiopathic hemolytic anemia also occurred in both patients. At autopsy, the kidneys of each patient were found to show the characteristic changes of malignant nephrosclerosis. The cause of the malignant course in these two individuals was not indicated.
It was not related to prolonged toxemia since both were toxemic for only a short period.

SAGALL


A short salt-loading test was performed on a series of women in the child-beariing age. Eight of the pregnant patients had developed pre-eclamptic toxemia and four more had hypertensive disease with some degree of renal failure. Three normal pregnant patients and two non-pregnant subjects were used as controls.

The delayed excretion of injected chloride found in the non-pregnant subjects was increased by pregnancy and much more so when pre-eclampsia was present. In pregnancy complicated by hypertensive disease and renal deficiencies, the rate of chloride excretion, however, was increased and exceeded that of the normal non-pregnant individual. Analysis of the results indicates that in normal pregnancy there is increased tubular re-absorption of chloride. With renal disease the increased output of chloride is related to the structural damage that has occurred. In pre-eclampsia, the diminished output of injected chloride is explained as being due to a functional change, differing from the normal only by degree. The authors believe that the increased re-absorptive capacity of the renal tubules for chloride in the pregnant state, both normal and pre-eclamptic, is related to adrenal action.

SAGALL


A group of patients with hypertension observed in pregnancy received Apresoline in gradually ascending doses from 40 mg. per day to 400 mg. per day or until the limits of tolerance were reached. In 10 patients, the dosage was increased further to 800 mg. per day. Of the 91 patients, 44 had hypertensive vascular disease, 29 had hypertension plus toxemia, and 18 had true toxemia. The importance of the ophthalmoscopic examination in the recognition of toxemia and the differentiation of this condition from hypertensive disease is stressed. The average effective dosage was found to range from 200 to 300 mg. per day. The incidence of toxicity increased at higher dosage levels without producing favorable therapeutic effects. Based on the blood pressure responses, there were 36 excellent, 9 good, 6 fair, and 40 poor results. Headache was the predominant toxic manifestation occurring in 34 patients; flushing of the face, dizziness, anxiety and drowsiness were also observed. The favorable response noted in 1 out of every 3 patients treated suggests that Apresoline should be administered in patients with early toxemia or progressive hypertension during pregnancy. Hospitalization is recommended if the toxemia process is not controlled within two weeks with this drug.

SHUMAN


The author describes a man, aged 40 years, with malignant hypertension who was treated with Hydralazine hydrochloride (Apresoline) for more than one year with dosages totalling 800 mg. daily for more than 10 months of that period. At the end of this time the patient developed a severe febrile illness associated with migrating pain, reddened elevated lesions of the skin of the legs, anorexia and tachycardia. The clinical picture resembled polyarteritis. Repeated L. E. tests were negative. Symptoms persisted even though the Hydralazine was discontinued. A favorable response followed treatment with ACTH and cortisone.

ROSENBAUM


Among 43 ambulatory hypertensive patients receiving Apresoline alone for from three to 22 months, 30 per cent had a good and an additional 28 per cent had a fair hypotensive response. When Veriloid was added to Apresoline some of the side effects of the latter drug were alleviated and the hypotensive response was improved to a degree that could not be achieved by either drug alone.

WESSLER

PATHOLOGIC PHYSIOLOGY


Labeled red cells or Evans blue were injected into a jugular vein and collected at very short intervals from the carotid or brachial arteries. These two were considered as reference substances which remain in the blood stream. When compared to these two substances there is little displacement of the curves representing sodium, para-aminohippurate, thiocyanate, insulin or urea. On the other hand deuterium and tritium oxides were observed to have considerable displacement. There was, however, little over-all loss. The authors consider that this represents passage and return of water through the capillary walls. The rate of this loss is almost equal to the output of the right ventricle. Diffusion, rather than a filtration hypothesis, fit the data.

OPPENHEIMER

In these experiments there was interference with the blood supply of the liver. Despite this there were no important changes in serum cholesterol, cholesterol esters or blood sugar. Degree of devascularization and time elapsed were not factors. Elevation in serum alkaline phosphatase was not proportional to the degree of devascularization. Serum albumin was markedly reduced and the A/G ratio was reversed. These last results are proportional to reduction in hepatic circulation and duration of devascularization was a factor. There was no tendency to bleeding.

Oppenheimer


Blood lipid data on 24 women who lost 15 to 60 pounds in weight, at rates varying from 0.6 to 2 pounds per week, on diets containing 1400 calories with 50–80 grams of fat daily, reveal a rather wide fluctuation which occurs in women whether losing weight under dietary control or changing little in weight without dietary control. Data was also presented for 12 women of comparable age who did not lose weight over a similar period of time.

The data provide no support for the view that weight loss is accompanied by a drop in cholesterol or other blood lipids. On the contrary, a slight rise was indicated for a majority of the subjects. In the case of serum cholesterol and phospholipids, statistical analyses revealed an increase of 0.58 mg. of cholesterol and 0.64 mg. phospholipid per pound of weight loss for the group losing weight; both were significant at the 5 per cent level.

Oppenheimer

Harris


Physical models are used in this study to analyze hydraulic and energy gradients in the systemic veins. Records were obtained in dogs simultaneously from various locations in the veins and from either intrathoracic or intra-abdominal locations. The intrathoracic and superior vena cava pressures vary in a parallel manner. The same statement can be made of abdominal inferior vena cava and intra-abdominal pressures. There is a marked change in the hydraulic venous gradient at the point of departure from abdomen into thorax. The central venous pulse is not transmitted beyond the thorax. Respiratory fluctuations are not observed in the jugular vein. The conclusion is expressed that venous return is not directly affected by respiration.

Oppenheimer


Pressor responses to nor-epinephrine were greater in duration in the presence of intact pressoreceptors. The mean of the pressor responses and that of the peak blood pressures were never as great after pressoreceptor denervation as during the control period when they were intact. It is concluded, in agreement with work on epinephrine, that elevation of blood pressure due to nor-epinephrine is not limited as to rise or as to peak attained by pressoreceptor reflexes. Some of the cardiovascular response seems to be lost after pressoreceptor denervation. In addition, myocardial depression is more marked after nor-epinephrine in the absence of pressoreceptors. Pulses alternans and small pulse pressures are common in this situation, more so than with epinephrine.

Oppenheimer


In thirty normal subjects Na24 clearances were determined from the skin of the forehead and the leg. The rate of clearance from the forehead was found to be always faster than from the leg. Clearance rates from symmetrical areas of the legs were generally almost equal, but in some cases there were distinct differences. The more rapid clearance from the forehead skin suggests that this is due to the greater vascularity of the scalp. A greater capillary surface is available for this clearance and there may be more rapid blood flow through these vessels than in those of the legs. Also there is a higher degree of vasoconstrictor tone in the vessels of the leg. The results appear to support the belief that the rate of clearance is a measure of local circulatory efficiency.

Enselberg


Studies were performed on 35 emphysematous patients and 13 controls in order to determine whether the diminished response to CO2 in emphysema was due chiefly to diminished sensitivity of the respiratory center. All subjects had respiratory function studies. Their response to breathing 100% oxygen, and 5–7% CO2 in oxygen were studied.

In 26 emphysematous patients the inhalation of pure oxygen was followed by a fall in ventilation. This was due to the relief of anoxia and did not occur in the patients with normal oxygen saturation or in the controls. As a result of this fall in ventilation there was a rise in alveolar pCO2, a corresponding rise in arterial pCO2, an increase in plasma CO2 and a fall in blood pH. The rise in ventilation while breathing CO2 was diminished in the emphysematous
patients. The influence of changes in pCO₂ in these patients was eliminated by measuring their responses to CO₂ under conditions of full oxygenation. The diminished responses could be correlated with the degree of CO₂ retention, being greater with higher levels of resting arterial pCO₂. Although part of the diminished responses is due to an increase in the blood buffering power, the major factor is most probably a reduction in sensitivity of the respiratory center.

Enselberg


The present study was conducted as the initial step in determining the mechanisms by which upper respiratory tract infections may precipitate congestive failure. The influence of such infections upon salt and water metabolism was examined in 17 normal medical students and compared with the results obtained in the same subjects during a symptom-free period. It was found that the differences between the control and U.R.I. observations in Evans blue space, thiocyanate space and body weight were not statistically significant. Similarly no differences were observed in the hematocrit, red cell count, hemoglobin, serum sodium, potassium, chloride, creatinine and freezing point depression during the two periods. The average change in total serum protein was an increase of 0.3 gm. per cent. The urine studies reveal no significant change in volume, specific gravity, or solute concentration. Thus, there were no alterations in salt and water metabolism found in normal subjects following the onset of minor respiratory tract infections which might explain the occurrence of congestive failure in cardiac patients under similar conditions.

Shuman


90 patients with various types of cardiac pathology involving the left ventricle, mitral regurgitation excluded, were submitted to hemodynamic studies. A certain relationship was found between various clinical stages and the hemodynamic alterations. Thus in the course of the evolution of the disease, the cardiac index, initially normal, tends to decrease progressively whereas the pulmonary capillary pressure rises. The left auricular pressure, on the other hand, does not change even in the terminal stages of the disease. None of these three factors is by itself characteristic for a certain stage but in association they provide information considering the phase of evolution. Sometimes, however, it may be necessary to resort to an exercise test in order to demonstrate the alterations of hemodynamics which may be normal at rest even in advanced stages of the disease. Treatment of existent heart failure may reduce the elevated pulmonary capillary pressure to normal or subnormal values at any stage. This does not occur when heart failure is due to mitral insufficiency.

Pick

Pathology


It is the purpose of this paper to report a case of cardiac sarcoma in which the ante-mortem diagnosis was not made but considered, and a case of hemopericardium secondary to carcinoma of the lung in which the ante-mortem diagnosis was made.

In case 1, the nature of the tumor was that of a sarcoma. The presence of the large mass in the wall of the right atrium suggested that the tumor originated at this site and involved the pericardium secondarily. The clinical picture was that of cardiac failure without obvious cause. An interesting feature was the roentgenographic and roentgenoscopic demonstration of prominence of the cardiac silhouette in the area in which a large left atrium commonly is noted in cases of mitral stenosis. More attention probably should have been given to this finding since at roentgenoscopy the prominence did not seem to be the left atrium.

In case 2, the hemorrhagic pericardial effusion resulting from metastasis of a tumor of the lung produced cardiac signs and symptoms which caused the patient to seek medical aid. Such an occurrence is unusual, since in cases of metastatic carcinoma of the pericardium it ordinarily is the primary tumor or extracardiac metastasis that produces symptoms and causes the patient to seek medical aid. Metastatic tumors of the heart usually produce few if any symptoms.

In the 2 cases reported in this paper, the common feature was the presence of pericarditis as evidenced by a transient friction rub, pericardial effusion, paradoxical pulse, and eventual cardiac tamponade. In the second case, the clinical diagnosis was confirmed by the finding of carcinoma cells in the pericardial fluid.

Simon

Pharmacology


Prolonged therapy with large doses of Hydralazine has been reported to produce a syndrome which progresses from mild arthralgia to a clinical picture of rheumatoid arthritis and finally to a simulation of
disseminated lupus erythematosus. A patient is reported in whom there was a reaction to Hydralazine exhibiting not only the clinical picture of rheumatoid arthritis and disseminated lupus erythematosus but also the pathological evidences of these diseases in the form of a rheumatoid nodule and acute collagenous necrosis of the skin.

**Kitchell**


Previous reports have appeared in the literature implicating large doses of Hydralazine over long periods of time with the syndrome consisting of rheumatic manifestations varying from fleeting mild arthralgias to full blown arthritis and followed in a few patients by a clinical picture that showed remarkable resemblance to acute disseminated lupus erythematosus. In this case a clinical and laboratory picture mimicking acute disseminated lupus erythematosus developed in a woman after therapy with moderate doses of Hydralazine over a period of 9 months. There was complete regression of all clinical signs and symptoms and all laboratory findings within one month of the discontinuance of therapy with the drug.

**Kitchell**


Superinfection is a by-product of chemotherapy which occurs when the normal bacterial population is altered by treatment of a patient with an infectious disease so that a serious infection is superimposed on one that for treatment was begun initially. This study is based upon observations made in 3095 patients who received one or more antibiotic agents. Patients who received one of the sulfonamides alone were not included in this report. There were 88 superinfections in this group of patients, an incidence of 2.19 per cent. Superinfections after penicillin treatment were apt to be due to gram-negative bacteria. Staphylococcus aureus infections tended to complicate penicillin or streptomycin therapy. In many instances the relative insensibility of the organism causing the superinfection was so great as to make its treatment much more difficult than the primary infection. In a few instances the secondary infection proved untreatable and fatal. The superinfection often involved the same organ as the initial infection. Regardless of the location of the first infection, the secondary involvement almost always involved the respiratory tract. The lower the involvement of the respiratory tract, the greater the incidence of superinfection was found to be. Superinfection occurred in 20 per cent of the cases of pertussis. Superinfection was more common with antibiotics or combinations of drugs having a broad antibacterial effect. Complicating infections were more common in patients three years of age or less. Most of the superinfections occurred between the third and sixth days of treatment of the primary disease. It is emphasized that secondary bacterial infections may occur despite the use of chemotherapy and that it is impossible to establish such infections specifically without bacteriologic study. The appearance of superinfection during the administration of an antibiotic may convert a benign, self-limited disease into a serious, prolonged or even fatal illness.

**Rosenbaum**


The inhibition of the enzyme, carbonic anhydrase, in the renal tubular cells reduces the availability of hydrogen ions within the tubular epithelium for exchange with the sodium ions of the glomerular filtrate in the lumen of the tubule. This sodium is excreted together with potassium ions which normally compete with hydrogen ions for excretion via the same tubular mechanism. The effectiveness of Diamox in producing diuresis was evaluated by means of determining the body weights of 25 patients in congestive heart failure requiring diuretics. The mean weight loss of the group per 48 hours was observed during the administration of Diamox and Thiomerin given at different intervals. The weight loss response to Thiomerin was found to increase in direct linear relationship to increasing doses of the drug. The majority of the patients lost less than two pounds per 48 hour period on Thiomerin. On the other hand, Diamox administration gave a uniform response in weight loss above the 250 mg. dosage and the majority of the patients lost more than 2 pounds per 48 hour period with this drug. It was shown to possess a high degree of diuretic potency with minimal systemic toxicity consisting of transient mild paresthesias of fingers and toes of 3 out of the 25 patients.

**Shuman**


Ethionine, the ethyl analogue of methionine, can induce fatty livers in rats. When dogs are fed 125 mg. of $d$-ethionine daily there is a prompt reduction in the level of serum fatty acids, phospholipids, and cholesterol. (The serum cholesterol fell from 180 to 20 mg. per 100 ml. serum.) Ethionine also caused a marked reduction in the level of low- and high-density lipoproteins. Removal
of ethionine from the diet resulted in a prompt restoration of all lipid and lipoprotein fractions to normal levels.

WAIFE


During controlled hypotension (induced by the continuous infusion of Hexamethonium, Pendiomide or Arfonad), the cerebral blood flow was decreased in 17 of 19 subjects. With the decrease in blood flow more oxygen was extracted from the blood by the brain. At low levels of blood pressure (under 60 mm. Hg) this compensation was at times inadequate and symptoms of cerebral hypoxia developed. The cerebral blood flow increased when the blood pressure was raised by vasopressor drugs.

WAIFE


 Loads of sodium bicarbonate administered to normal rats in drinking water along with known amounts of potassium and chloride did not produce alkalosis after two weeks as long as potassium chloride intake exceeded 0.5 mM/kg./day even though sodium bicarbonate intake amounted to 10–30 mM/kg./day. Alkalosis could not be produced in this way in the absence of potassium deficiency, as demonstrated by muscle analysis.

Other rat experiments suggest that citrate may be substituted for chloride in the renal defense against alkalosis so that sodium is excreted without chloride and without change in urinary pH. Potassium appears essential for the maximal conservation of chloride in this way.

The authors’ results suggest that potassium deficiency may alter the ratio in which sodium and chloride are reabsorbed from the glomerular filtrate. Such an alteration leads to changes not only in extracellular concentration but also in extracellular volume.

HARRIS


Each patient prior to the institution of Tetraethylthiuram disulfide (Antabuse) therapy should be exhaustively studied from a cardiac standpoint. Thirty-five per cent of the patients in the present series showed evidence of dangerous cardiac embarrassment in alcohol-Tetraethylthiuram disulfide testing, despite negative cardiac history and absence of abnormal clinical findings. Special consideration, therefore, should be given to this group of patients as regards continuation of Tetraethylthiuram disulfide therapy.

BERNSTEIN


Studies were performed on 33 patients with peptic ulcer who were being treated with a milk drip containing large amounts of sodium bicarbonate. Doses up to 145 gms. daily were well tolerated for as long as three weeks. All patients developed alkalosis with a rise in plasma CO₂ and blood pH, but adverse symptoms were few and trivial. Renal function studies showed an increase in glomerular filtration. Plasma sodium rose in most cases, balance studies indicating retention of large amounts of sodium. Most of the sodium appears to be accommodated in a greatly expanded extracellular space, and there is probably a shift of chloride from cells to extracellular fluid as bicarbonate is exchanged.

It would appear that alkalosis per se rarely causes renal damage and that the renal failure seen in the clinical alkalosis results primarily from dehydration or hemorrhage. The renal failure is of ischemic origin and not a direct consequence of alkalosis. Although the authors have shown that large doses of alkali can be easily handled by patients with good renal and cardiac function, they stress the need for close clinical and biochemical supervision of the treatment, preferably in a hospital.

ENSELBERG


The author studied the effects of hypotensive drugs in a series of 77 patients. Of these 53 were suffering with pre-eclampsia, 2 with eclampsia, 15 with essential hypertension with superimposed pre-eclampsia and 7 with essential hypertension. Of this series 29 received no treatment and served as controls. During the period of testing all the patients were hospitalized and placed on a low-sodium diet.

Three drugs were studied separately and in conjunction with each other. Veratrine was given intravenously to 18 patients. The rate of flow was adjusted depending upon the resulting degree of hypotension and bradycardia. After 24 to 48 hours of intravenous therapy, the subcutaneous route of administration was employed with injections at two hourly intervals to maintain the blood pressure at approximately 140/90 and the pulse at 80. Veren- teral, a purified alkaloid of Veratrum Viride, was employed in 10 patients. Initially, the drug was given rapidly intravenously and then followed by
slow continuous intravenous. Apresoline was given intravenously to 20 patients. It was administered every 6 to 8 hours depending upon the degree of hypotension. The most severe pre-eclamptic patients were selected for treatment with Apresoline. In 14 patients tetro-ethyl ammonium chloride was used as a testing agent to determine the degree of neurogenic and non-neurogenic hypertension.

In acute toxemia, Veratrone produced a constant hypotension and bradycardia. This was usually associated with nausea and vomiting. During the period of maximum hypotension the urinary output was temporarily reduced.

Similar results were obtained with Verenteral. In four cases, however, ventricular extrasystoles were induced by this drug.

Apresoline in acute toxemia resulted in a marked hypotension and tachycardia. Headache was observed in 32 per cent of the patients. There was no suppression of urinary output. Clinical improvement, both subjective and objective, was observed routinely following Apresoline administration.

The author concludes that the hypotensive drugs offer a physiologic mechanism for the release of the vasospasm associated with the acute toxemias and that Apresoline has simplified the treatment of toxemia. Drugs of this nature offer definite promise in these cases and further investigative work is indicated.

**SAGALL**


Observations were made on the acute renal hemodynamic response to a continuous intravenous infusion of Aramine, a synthetic sympathomimetic amine, in dogs. As the blood pressure increased, renal vasoconstriction occurred and renal blood flow was depressed. When renal vasoconstriction became marked, glomerular filtration was also depressed. The renal excretion of water and electrolytes was not altered in any consistent fashion unless glomerular filtration rate was markedly reduced. When this occurred, the excretion rates of water and sodium were depressed.

The blood pressure and renal hemodynamic response to a continuous infusion of Aramine were completely blocked by the antecedent administration of Dibenzyline, thus suggesting that the renal vasoconstrictive response to adrenergic drugs is blocked by adrenergic blockade.

**MAXWELL**


A series of 41 hospitalized psychiatric patients with arteriosclerotic changes was utilized to evaluate the effects of intravenous and oral Metrazol. A group of 17 was given the drug intravenously, a group of 11 received the drug orally, while a third control group of 13 received placebo medication. The entire group of patients was assumed to be approximately stabilized arteriosclerotics; the majority were classified as having chronic brain syndrome with associated or dissociated psychiatric disorders. Based on clinical impression, one-third of the intravenous group and about one-half of the oral group improved significantly, and about one-fourth of the control group showed changes suggesting improvement. The general clinical impression of improvement was not borne out by psychologic tests, which failed to show statistically significant differences in the 3 groups.

**PHYSICAL SIGNS**


Ten patients with musical aortic diastolic murmurs were observed during a 12-year period. All occurred in Negro males and were of syphilitic etiology. An analysis of the authors' series combined with previous reports showed that the vast majority were due to syphilis, the remainder being associated with rheumatic aortic valvulitis, bacterial endocarditis, or traumatic rupture. The right anterior aortic cusp is by far the most often involved, usually with erosion of the cusp. Appearance of the murmur was generally followed by marked adverse change in the circulatory status and gravely altered the prognosis; nine of the patients died within 9 months, and the remaining one lived 18 months. It was felt that the appearance of a musical aortic diastolic murmur is an ominous prognostic sign, usually indicative of erosion of the right anterior aortic cusp.

**MAXWELL**

**PHYSIOLOGY**


A new method is described for bloodless continuous registration of the heart rate, systolic and diastolic pressures, pulse amplitude and respiration. The principle consists of amplification of deflections in an infra-sound pulse recorder described previously by the authors. In practice, two such instruments, attached to an extremity, proximal and distal to an ordinary blood pressure cuff, are necessary to follow the alterations in peripheral circulation. The details and the handling of the complex apparatus are described and illustrated by an example of an actual record in a hypertensive patient.
A method of determining the systolic blood pressure by palpation over the dorsalis pedis with the sphygmomanometer cuff above the ankle is described. This is a useful simple screening test in recognition of coarctation of the aorta and may have value in the study of peripheral vascular disease.

Kitchell

A new technique was described for measuring the left ventricular pressure curve in the unanesthetized man. In the method reported, a needle was first introduced through the posterior chest wall into the left atrium and a small plastic catheter then threaded through the needle via the left atrium into the left ventricle. One case report and several tracings were presented from 28 patients in whom the procedure was successfully performed. The detailed techniques, dangers and limitations were described.

Maxwell

In 32 patients, submitted to cardiac catheterization mostly because of mitral disease, determinations of cardiac output according to Fick’s formula were compared with values obtained by the physical analysis according to Broemser-Ranke. The study revealed that due to excitement caused by the procedure of catheterization, determinations by Fick’s method yield almost regularly too high results. The same difference of 25 per cent was found consistently in output determinations by the other method, as well as in comparative measurements of heart rate and O₂ consumption, performed before and after cardiac catheterization. The sources of error involved in the Fick method are discussed and the possibilities of recognizing elements of the variable factor of excitement are pointed out.

Pick

Roentgenology

The authors are concerned with the thin horizontal linear shadows which occur in the lateral lower lung field of thoracic roentgenograms taken of patients with acute or chronic pulmonary congestion, primarily patients with mitral valvular disease.

These shadows are perpendicular to the lateral chest wall, parallel to each other, spaced 0.5 to 1.0 cm. apart, ranging in thickness from mere visibility to a width of 0.1 to 0.2 cm. and extending into the lung fields no more than 1 to 3 cm. When persistent, the shadows are believed to be due to hemosiderin preferentially appearing alongside and within interlobular septums and are felt to be more frequently seen than the generalized nodularity of far-advanced acquired pulmonary hemosiderosis. When transient and associated with acute pulmonary congestion, the shadows are considered due to widening of the interlobular septums by edema fluid.

Similar shadows in occasional cases of pneumocnosis and diffuse pulmonary fibrosis are believed due to fibrous thickening of the interlobular septums. These shadows are differentiated from plate-shaped areas of atelectasis which are usually thicker and extend more deeply into the lung. Intrapulmonary scars of infarcts or interstitial extensions of pleurisy are coarser and usually accompanied by visible pleural thickening.

Rosenbaum

Rheumatic Fever

Ninety-six individuals who had previously had or did have active rheumatic fever and whose ages ranged from 5-20 years were maintained for as long as 14 months with an injection of benzathine penicillin G (Bicillin) 1,200,000 units administered every 4 weeks intramuscularly. During this period of prophylaxis, 1,045 cultures were taken. Although 40 cases showed the presence of beta hemolytic streptococci, only 4 were found to be of the Lancefield group A type. In outpatients with inactive rheumatic fever who were given benzathine penicillin for 7 months, there was only one positive culture that proved to be of Lancefield group A, and there were no group A streptococci found during January, February, or March of 1954. No clinical recurrences of rheumatic fever were observed in patients whose rheumatic activity was quiescent when prophylaxis was instituted. The difficulties inherent in oral medication are that the patient may, or may not, take the dose. The introduction of benzathine penicillin into the medical armamentarium offers a physician an agent that may prove most effective in maintaining an individual patient under observation and management by monthly injections. A program of continuous prophylaxis to stave off intercurrent streptococcal disease appears thus far to be the best available method for the prevention of recurrent attacks of rheumatic fever.

Kitchell

A study was made on 144 young male rheumatics upon the effects of ACTH, cortisone, and aspirin on the antistreptolysin "O" titer and the gamma globulin concentration in serum during activity of the disease process. Treatment was carried out for six weeks. Signs of hyperadrenalism appeared in those treated with ACTH, but not in those treated with cortisone. Infection was eradicated in every individual by penicillin treatment for two weeks followed by daily sulfadiazine administration during the remainder of the study period. Antistreptolysin "O" titer fell most rapidly in ACTH treated patients. The decrease seen in cortisone and aspirin treated patients was statistically not different from the other, but it was definitely less rapid than in the ACTH treated individuals. Precisely the same effects were seen on gamma globulin concentration in the serum following these three therapeutic agents.

Harvey


Three cases are described in detail in which the diagnosis of rheumatic mitral stenosis was made prior to operation or ante-mortem. In one patient a myxoma of the left auricle was found. Although it was separated from the left atrium, attempts to deliver it into the pulmonary vein failed and it was fractured during removal from the left ventricle with embolization and death. In the second case there was a congenital anomaly of the myocardium of the left auricle which produced functional stenosis of the outflow tract of the left ventricle. In the third case collagenous mediastinal thickening constricted the pulmonary veins and produced inflow obstruction into the left atrium.

The clinical entities which may simulate mitral stenosis are described briefly. It is pointed out that intracardiac tumor should be suspected when the murmur is inconstant or variable, the response to digitalis early in the clinical course is poor, there is no history of rheumatic fever, the progression of congestive failure is rapid, there is severe dyspnea and precordial pain in episodes, and the murmurs or clinical status are altered by changes in position. The authors emphasize the importance of awareness of conditions imitating mitral valvular disease in the selection of patients for commissurotomy. When such procedures are undertaken facilities should also be available for removal of tumor, pericardectomy, correction of a congenital anomaly or other surgical procedures for these confusing disorders.

Rosenbaum

SURGERY


Because the thoracic aorta and aortic arch cannot be occluded for prolonged periods without the danger of producing spinal cord ischemia and paraplegia, the authors developed, in dogs, a new and simpler technique for keeping the blood circulating through the aorta while a graft was being inserted. A homologous graft shunt was sutured in place with two end-to-side anastomoses while the recipient aorta was only partially occluded at two levels with Potts and Beck aorta clamps. None of the dogs developed paraplegia although during the time of partial occlusion it was estimated that from 50 to 66 per cent of the lumen of the thoracic aorta was obstructed by the clamps. The authors believe that this method is superior to the use of temporary polyethylene shunts. In one patient the method was successfully employed in inserting a graft and removing a large innominate artery aneurysm.

Wessler


A case of superior vena cava obstruction, probably due to a nonspecific mediastinitis was treated by re-establishing circulation with an arterial graft chosen from the blood vessel bank. This graft was an adult descending aorta of ideal length and size. The period of observation following this operation is ten months at present. The authors recommend the use of preserved aortic grafts for the relief of superior vena cava obstruction because of desperate plight of patients with such conditions.

Kitchell


The authors report on serial roentgenographic studies made on 44 consecutive patients subjected to mitral commissurotomy. Of the 44 patients, 7 died and 17 could not be adequately followed. Of the remaining 20, chest roentgenograms were obtained over periods ranging from 6 months to 2 years. Immediately after operation, the cardiac silhouette was found to enlarge moderately to massively in each instance, the enlargement apparently involving all chambers. This feature was prominent in all individuals who died postoperatively. During the serial studies, it was found that 11 patients had larger cardiac silhouettes, 4 were unchanged, and 5 were smaller. There was no evidence that mitral commissurotomy can produce a decrease in the size of that part of the cardiovascular system proximal to the obstruction. The enlarge-
ment of the heart noted in many of these patients was considered to have prognostic significance. Some of the factors operating in this connection are pericardial effusion, surgical production of mitral regurgitation, atrial fibrillation, cardiac failure and rheumatic carditis. The authors believe that the reactivation of rheumatic fever best explains generalized cardiac enlargement seen in these individuals. In rare instances, the surgical production of mitral regurgitation may produce permanent cardiac enlargement. In 5 of the 20 patients, diminution of heart size after commissurotomy was attributed to a natural remission from the preoperative event precipitating heart failure.

**SHUMAN**


In the Bjork-Crafoord operation, dissection between the two atria creates a groove between the superior vena cava and the right pulmonary veins and a suture is passed in such a way that when tied it obliterates the defect without encroaching on the vena cava, the coronary sinus, or the tricuspid valve. This operation was successfully used to close a large defect in the heart in a case of cor triloculare biven-triculare.

**KITCHELL**


Surgeons are becoming aware that special techniques and methods of care which differ from those commonly used in the adult are necessary in the younger patient. This paper outlines the special problems and the management the authors have found useful in the infant or child undergoing thoracic surgical procedures. Premedication should be light and the dose should be based on body weight. Atropine may often be omitted. Anesthesia should be conducted carefully to avoid anoxia which the child tolerates poorly. Hyperthermia must be avoided and artificially induced hypothermia has often been found useful in children with cyanotic heart disease. During surgery gentle handling of tissues and careful placement of intercostal tubes is important. In postoperative care close nursing supervision and special medical care with proper equipment is needed. Fluid balances and antibiotic administration must be carefully supervised. An atmosphere with adequate oxygen and a high humidity is needed for proper respiration.

**KITCHELL**


The authors reported a case of superior vena cava syndrome in a male which was due to a large intrathoracic adenomatous goiter exerting pressure either on the superior vena cava proper or on both innominate veins. Removal of the tumor caused almost immediate disappearance of symptoms and signs, thus indicating either that the obstruction had not been complete, or, if complete, that thrombotic occlusion had not occurred.

It was pointed out that dilated hilar veins, frequently an integral component of the superior vena cava syndrome, produces a hilar shadow on x-ray which may simulate one caused by a pulmonary neoplasm.

**ABRAMSON**


The authors described a technic for performing mitral commissurotomy through a right thoracic approach at the level of the fourth intercostal space. In order to expose the lateral portion of the left atrium, it was necessary to mobilize the superior vena cava. This type of procedure was utilized when there were such associated valvular lesions present as tricuspid stenosis, pulmonary pathology and Lutembacher's syndrome. In this manner, a single operation could be utilized to take care of both conditions, thus decreasing the chance of morbid complications and increasing the rate of survival.

**ABRAMSON**


The authors describe a cardiac stimulator incorporating (1) an inexpensive circuit combining a defibrillator and a pacemaker; (2) portability, simple operation, and easy repair; (3) a rapidly applied electrode system for both medical and surgical emergencies; and (4) safety for both patient and physician.

**KITCHELL**


Brock believes that present methods of correcting aortic or mitral valve incompetence are unsatisfactory. A plastic valve cannot be trouble free for long. Biologic tissues fail 1) because they transform into solid masses unsuitable for valve function 2) placement is such as to fling the flap through the orifice producing obstruction and 3) the axis stream of regurgitation likewise catches the flap and projects.
it through the orifice. Perhaps some method of narrowing the dilated ring may be effective.

"At present, it is difficult to feel justified in advising any patient who is suffering from predominant valve incompetence to submit to an operation for its correction."

SOLOFF


In this group 45 had infundibular resection only, 37 had valvotomy only, and the remaining 18 required both procedures. The mortality in the valvotomy group was 11% and in the group with infundibular resection, 18%. However, improvement was greater and more consistent in the latter group. In fact, some patients lost all cyanosis at rest and a few even after exertion. In these arterial oxygen saturation was normal and the right-to-left shunt was found by cardiac catheterization to have been reversed. The authors believe that there is no appreciable risk of creating a condition comparable to Eisenmenger complex. Enough pulmonary stenosis remains in most cases to prevent inordinate rise in pulmonary artery pressure.

MCKUSICK


In general the object of valvulotomy is to improve the cardiac reserve and exercise tolerance of a patient with mitral stenosis and thus restore the individual to an active life. In the pregnant woman the objects of the procedure are many: (1) to improve the cardiac condition for an easier antenatal and labor period, (2) to shorten puerperal convalescence thus enabling restoration of the mother to her household sooner and in a better condition than would be expected in an untreated case; (3) to diminish the chances of congestive failure during the pregnancy, (4) to offer a procedure which may obviate the necessity of termination of pregnancy and sterilization by reducing the morbidity and risk of pregnancy in these patients, and (5) to improve the immediate as well as the ultimate prognosis. The risks of this operation in pregnant women must also be considered. Although the mortality in general is 7.5 per cent, there is every indication that this will decrease in the future with more experience and better selection of patients. Since any operative procedure in pregnancy entails a risk of inducing abortion or premature labor, the operation should not be performed prior to the third month nor after the 34th week of pregnancy. The risk that anesthesia may cause intrauterine death of the fetus is no greater than that associated with Caesarian section. With these factors in mind the author believes that valvulotomy should be considered as an alternative procedure to termination or sterilization in selected pregnant patients. Therapeutically the patients should be grade II (b) or grade III in severity. The predominate lesion should be mitral stenosis without gross mitral insufficiency or aortic lesions. The myocardium should be healthy and an active rheumatic process must be ruled out. Previous congestive failure in pregnancy or evidences of congestive failure in the present pregnancy favor operation. If on general grounds valvulotomy is indicated, the presence of a pregnancy without obstetric complications should not contraindicate the operation. Two cases in whom successful mitral valvulotomy was performed during pregnancy are presented to illustrate the points discussed above.

SAGALL


Because the treatment of dissecting aortic aneurysm by conventional conservative methods rarely prolongs life, the authors hypothesize that surgical intervention may be of value. Based on knowledge of the pathogenesis of dissecting aneurysm, several surgical techniques are described for use in patients with dissecting aneurysm. The authors clearly state that there is no experimental or clinical evidence to indicate that these techniques are effective.

WESSLER


Because of the increasing importance of coronary artery disease in patients subjected to surgical procedures the authors have summarized the morbidity and mortality observations in 32 patients undergoing 51 major operations over a three year period. In 17 of the patients with myocardial infarction there were three deaths, each of which was attributable to the presence of coronary artery disease. Two were due to recent myocardial infarction and one to congestive heart failure. An additional patient experienced auricular fibrillation which responded promptly to treatment. In 15 patients with angina pectoris there were no deaths while two developed congestive heart failure. It is agreed that 3 to 6 months should elapse following an acute myocardial infarction to permit repair of the heart muscle prior to operation. The authors feel that their figures reflect the improved outlook for the coronary artery disease patient undergoing surgery.

SHUMAN

The surgical experience at the Greek Red Cross Hospital with 32 arterial aneurysms and 26 arteriovenous fistulae is reviewed. The techniques employed included ligation, extirpation, obliterate endo-aneurysmorrhaphy and restorative endo-aneurysmorrhaphy. The author states that these older methods—as contrasted with venous and arterial grafting—are capable of producing satisfactory results in many instances.

Wessler


Twenty-nine patients with aortic aneurysms were treated by excision and replacement with aortic homografts. There were six deaths: three from coronary artery disease, two from progressive uremia and one from pulmonary embolism six weeks after discharge from the hospital. Most of the patients showed improvement in the circulation in the lower extremities following operation and all have had complete relief of symptoms. The follow-up period has, in general, been less than twelve months. For graft preservation the technique of freeze-drying is considered the method of choice. Several important technical details are briefly described.

Wessler


Occlusion of the aorta, at or near the arch, for varying periods of time, carries the risk of ischemic damage to the spinal cord or to vital organs. The authors report resection of a fusiform aneurysm involving the distal portion of the arch of the aorta with restoration of normal blood flow by means of an aortic homograft. The fact this was done after hypothermia had been induced is of added interest. The feature deserving major consideration here is that there was no ischemic damage to the spinal cord or other vital organs after arrest of aortic circulation distal to the left common carotid artery for one hour's time. This would suggest that hypothermia is an effective means of prolonging the safe period for temporary arrest of the aortic circulation.

Kitchell


Three cases are described in detail in which aortic aneurysms were resected and successfully replaced with grafts. The longest follow-up was three years.

Wessler

THROMBOEMBOLIC PHENOMENA


The authors describe another case of this condition which goes by various denominations—in this country, mainly thrombotic thrombocytopenic purpura—and which is characterized by fever, acute hemolytic anemia, thrombocytopenia with purpura and other hemorrhagic manifestations, and fluctuating neurological signs. The morbid histology comprises widespread patchy thromboses of minute blood vessels. All reported cases so diagnosed have been fatal.

McKusick


In the patient described, 58 years old, a recent myocardial infarction had occurred but no intraventricular thrombi were discovered. The source was quite clearly large thrombi on atheromatous ulcerations of the ascending aorta; the formation of thrombi at that site may have been abetted by the hypotensive state accompanying the myocardial infarction.

McKusick


The mechanism of death from pulmonary embolism is often shock, possibly of reflex origin. A case is described in which survival of the patient was attributed to the administration of the vasopressor agent. Acute gastric dilatation was a complication of the drug therapy.

McKusick

VASCULAR DISEASE


In intact dogs with a 29% increase in body weight due to overhydration, hypertension or vascular damage is not observed even when the urine is being deviated into the circulation. An equal hydration in the absence of the kidneys does elicit the disease. More damage is done if the overhydration occurs rapidly. The vascular lesions are intensified by an elevated blood pressure. A low sodium concentration of serum protects but a small increase is without effect. Sodium space for Na²⁺ was increased even though that for deuterium was not. Spinal transec-
tion at C₈ had no effect on renoprival hypertension and vascular damage. The fact that renoprival dogs are susceptible to hypertension and vascular damage depends on the loss of a non-excretory function of the whole kidney.

Oppenheimer


Two patients with intussusception due to visceral angitis of the cecum are described. In one patient the diagnosis of periarteritis nodosa was established by the laboratory, clinical, and histopathologic studies. In the other patient, the clinical and histological features, while not clearly those of periarteritis nodosa, were in the category of a "visceral angitis".

The two patients presented here, however, illustrate that abdominal complications of visceral angitis may at times produce true surgical emergencies. Perforation of a hollow viscus due to involvement by periarteritis nodosa has also been described, and this would constitute another example of a surgical emergency in this disease. Even segmental infarctions may lend themselves to surgical removal, permitting survival of a patient who might otherwise die.

Bernstein


The author studied walking venous pressures in the lower extremities in normal subjects and in patients with varicose veins, postphlebitic sequelae and arteriosclerosis obliterans. In normal individuals exercise caused a rapid and sustained fall in venous pressure and a quick return to control levels after termination of the physical effort. In the case of patients with varicosities, the drop was much less than normal. However, following vein ligation and stripping, it became more marked. In the case of the subjects suffering from postphlebitic sequelae, vein surgery also resulted in a greater fall in venous pressure than had been observed preoperatively.

Abramson


Fresh aortas were examined from over 2,000 swine varying in age from three months to four years. The percentage of aortas showing changes was quite small (3% per cent) in swine under one year of age and rose almost linearly to 35 per cent in swine over three years of age. The plaques were located usually in the descending arch or thoracic aorta. They were composed of fibrous connective tissue, and had little lipid material and no calcium precipitates.

Harvey


In a series of well controlled experiments a pneumonitis was established by inoculation intratracheally of Klebsiella pneumoniae and Pasteurella pseudotuberculosis in normal rabbits and in rabbits with high serum lipid levels produced by cholesterol feeding. The pneumonitis was identical qualitatively in the two groups, but in the rabbits with high serum lipid levels, tremendous quantities of lipid were deposited in the inflamed areas and was taken up by phagocytes. In a similarly fed two groups of rabbits, a muscle was made ischemic by ligation of its nutrient artery and stripping of its sheath. Again in the necrotic lesion lipid deposition occurred, but it was much greater in those rabbits with high serum lipid levels. The authors suggest this process is dependent upon local physicochemical stability and not on high serum lipid levels per se, except that this influences the reaction quantitatively.

Harvey


The author describes four cases of Trousseau's syndrome, recurrent phlebitis migrans in association with visceral carcinoma, and one case of Raynaud's syndrome with carcinoma of the stomach. The latter is a rare but seemingly bona fide association. The cause of the Trousseau syndrome was carcinoma of the lung in three cases and of the head of the pancreas in one. The author believes that blood-borne neoplastic cells initiated these thromboses; the formation of thrombi about the cells probably results in their death.

McKusick


The authors had previously found an inverse correlation between the tissue mast-cell content and susceptibility to alimentary lipemia or atherosclerosis. This report is a quantitative study of mast cells in human hearts. The cells were counted in toluidine blue stained sections from the myocardium of 46 young adults under the age of thirty-five, 48 elderly adults with marked generalized atherosclerosis over age sixty, and 48 elderly individuals without gross evidence of atherosclerosis. The cases were evenly divided by sex. Counts were made without knowledge of the identity of the samples.

The results indicate that atherosclerotic senile individuals had a lower count than nonatherosclerotic young adults. There was no significant difference between the nonatherosclerotic young or old adults. Furthermore, there was a statistically sig-
nificant difference between young female adults and elderly atherosclerotic females.

According to the authors, the only common features of each group were the presence or absence of atherosclerosis, the sex, and, within broad limits, the age. They believe that there are indications that the tissue mast-cell concentrations are influenced by the adrenal and other hormones and that it is possible that variable conditions of endocrine imbalance may account for the variations found within each group.

WAIPE


The histogenesis of cerebral arteriosclerosis has been studied in the basilar arteries of 124 patients ranging in age from newborn to ninety-three years. This has been supplemented by gross examination of 37 circles of Willis in which locations of plaques have been mapped, internal and external diameters measured, and vascular anomalies recorded. Differences in histologic pattern of development of arteriosclerosis in the basilar artery from patterns observed elsewhere are in large part determined by certain inherent weaknesses of the wall characteristic of cerebral arteries, and account for the considerably higher incidence of aneurysm and rupture than occurs elsewhere. Measurements of the internal and external diameters of arteries have permitted calculation of effective hydrostatic tensions in various locations in the circle of Willis. The calculated tensions have been correlated with degrees of dilatation and thickening of the wall with age, and with the frequency of plaque formation.

From such data and the histologic studies a concept has been derived that arteriosclerosis is fundamentally an adaptive response, structural as well as biochemical, to mechanical factors, in which all layers of the arterial wall are involved. Some physical factors are of general type, others local in character. Alterations in arteries which lead to the development of arteriosclerosis are of an adaptive nature which tend to minimize the increase in internal diameter produced by hydrodynamic factors acting over long periods of time. The investigators observe that mechanical factors act to stimulate the new formation of certain tissue elements, and the breakdown of other structures with local release of metabolites, particularly lipids, which may remain in the vessel wall.

HARRIS


The authors review the literature of primary thrombosis of the internal carotid artery and report seven new cases with cerebral circular and metabolic studies. Atherosclerosis is the commonest cause of this condition. The left internal carotid artery is more frequently involved by spontaneous thrombosis than is the right. There are four reasonably well defined clinical syndromes associated with spontaneous thrombosis of the carotid arteries in the neck: (1) The onset of symptoms may be sudden and acute, in which case the clinical picture usually closely simulates that of an intracerebral vascular lesion. Careful palpation of the vessels in the neck may provide the clue to the extracerebral location of the lesion. (2) The onset of symptoms may be insidious with transient episodes of visual disturbances, hemiplegia, monoplegia, aphasia, etc., with a slowly progressive course over a period of months or years, resembling the course of an expanding intracranial lesion. (3) If a thrombus in the internal carotid artery extends to involve and occlude the ophthalmic artery, homolateral blindness and contralateral hemiplegia may result. (4) Thrombosis of the internal carotid artery may occur silently without significant disabling or localizing signs.

Cerebral circulatory studies in these seven patients did not reveal hemodynamic or metabolic changes that could be convincingly attributed to unilateral internal carotid artery thrombosis alone. However, others have shown that the interruption of blood flow through one internal carotid artery is accompanied by an increase in cerebral vascular resistance. The investigators found that neurologic sequelae in internal carotid artery thrombosis occur only when this increment in cerebral vascular resistance is superimposed upon a pre-existing increase in cerebral vascular resistance of sufficient magnitude to reduce cerebral blood flow to a level which is insufficient to maintain the structural integrity of the entire brain.

HARRIS


Thirty patients suffering from ischemic disturbances of the lower extremities were treated by repeated intraarterial infusions of histamine phosphate according to the method of Mufson. No serious incident occurred during the course of the intraarterial infusion. Improvement in the ability to walk was striking in ten out of twelve subjects with uncomplicated intermittent claudication. When the claudication was associated with pain at rest (two cases) or by infection in the extremities (two cases) the treatment had a beneficial effect on the complication, but none on the claudication. In the presence of frank (2 cases) or imminent (12 cases) gangrene, the results of treatment were generally disappointing. The indications for various other
therapeutic procedures in ischemic disturbances of the lower extremities are briefly discussed.

OTHER SUBJECTS


This is a case report of a white male who developed progressive muscular dystrophy at the age of seven and succumbed at the age of thirteen. He had signs of cardiac involvement with decompensation for one year prior to death. The propensity to tachycardia and arrhythmia is discussed. An autopsy report is included.


Methods are described for portal venography, accomplished by injection of radiopaque material either percutaneously into the spleen (the splenic portogram) or into a branch of the portal venous system during laparotomy (the portal portogram). Examples are described that illustrate the usefulness of these procedures to the surgeon contemplating the performance of portacaval shunting.

De Langen, C. D.: The Placenta as an Example of the Peripheral Heart. Cardiolgia 24: 346 (Fasc. 6), 1954.

The author raises the question of the mechanism of placental circulation and doubts the validity of concepts ascribing maintenance of the foetal circulation to the contraction of the embryonic heart. The villi of the placenta show peristaltic movements but these are not synchronized with the pulsations of the placental arteries originating in the foetus, and occur independently from the contractions of the maternal heart. It is unconceivable that the small recently developed foetal heart could develop such a pumping force as to drive the blood through the capillaries of the foetus, to the umbilical cord, and back through the liver capillaries to the heart. It must therefore be assumed that potential, possibly chemical, energy of the placental villi is in some way converted to kinetic energy which makes possible the complex foetal circulation. There is no vasomotor system involved to assist this process because the foetal side of the placenta and the umbilical cord do not possess a nervous system.


Surface cooling as a method for producing hypothermia carries with it risks of damage to skin, subcutaneous tissues such as fat, and nerves. Rate and depth of cooling are difficult to control. A secondary drop in body temperature, owing possibly to relief of peripheral vasoconstriction and perfusion of cold surface tissues may occur when the source of cold is removed.

Cooling of the arterial blood in an extracorporeal circuit obviates many of these difficulties but has the disadvantage that its efficiency is considerably dependent on cardiac output. As output falls with drop in temperature further lowering of temperature is effected with difficulty. Furthermore the arteriovenous fistula necessary for arterial cooling is likely to lower diastolic pressure and in instances of congenital malformation the latter phenomenon may aggravate right-to-left shunt.

The method the author describes involves leading blood from the superior vena cava, passing it through a cooling medium and returning it to the saphenous vein. An adult patient who was maintained at 26°C for one hour recovered without complications from closure of an atrial septal defect.


The diffusion constants of deuterium and tritium oxides in water are similar. Since the self-diffusion constant of water may be much greater than those of deuterium and tritium, it is not possible to conclude that the use of these two substances as tracers for water is valid.


Tourniquet shock was produced in rats when moribund; replacing the tourniquet did not prevent death. Saline infusion produced a temporary improvement and prolonged life. There was a temporary rise in blood pressure and an increased concentration of red cells in blood. Much of the fluid given appeared in the injured leg. If replacement of the tourniquet was combined with administration of saline there was a rapid improvement in the rat’s condition.


Death rates among 187,766 white men between the ages of 50 and 69 were studied in 1932. Their smoking histories had been obtained in 1951 by volunteer workers in 394 counties from 9 states of this country. The study areas covered large cities, smaller communities and rural districts. It was found that men with a history of regular cigarette
smoking have a considerably higher death rate than men who have never smoked or men who have smoked only cigars or pipes. A total of 3,002 deaths occurred among men with a history of regular cigarette smoking. If they had died at the same rate as men who never smoked, only 1,980 would have died. So 1,022 additional deaths (52% above expectancy) occurred among regular smokers of cigarettes. A breakdown of causes of deaths suggests that 56% of the total effect of regular cigarette smoking on the overall death rate may be attributed to the effect on diseases of the coronary arteries. Approximately 26% of the total effect of cigarette smoking on the over-all death rate may be attributed to the effect of cigarette smoking on deaths from cancer. The death rate from lung cancer was much higher among men with a history of regular cigarette smoking than among men who never smoked regularly. Regular cigarette smokers also had a higher death rate from cancer of sites other than the lungs than did men who never smoked. The authors feel a cause and effect relationship has been established between regular cigarette smoking and diseases of the coronary arteries and between such smoking and lung cancer. More information is needed before such statements of relationships can be made about cancer of sites other than the lungs and other diseases.

Kitchell


In general, spectrum analysis is a procedure whereby a measurement is made which considers the energy distribution of a physical occurrence as a function of time and frequency. The sound spectrograph, as widely used in speech research, produces patterns that show the frequency components present in audible sounds. A preliminary report is presented of a new application of spectrum analysis, cardiospectrograms, in which a graphical-spectrum display is made of heart sounds.

Although the technique is still being modified, records of certain typical cardiospectrograms were presented and discussed. Normal heart sounds presented a wide variety of patterns. In general, however, visual portrayal of these sounds shows that the low component of the first sound predominates in some individuals but not in others; that the length of the sounds does not differ so much as one's audible experience leads one to think; and that a third sound is often seen when it cannot be heard. Another point of interest concerned the analysis of presystolic “crescendo” murmurs. The spectrographic analysis demonstrates no increase in loudness of the murmur as it develops nor increasing predominance of the low end which might make the murmur sound louder as it progresses up to the first sound. The sharp element of the apical first sound associated with this murmur apparently is always short and high-pitched, lacking a predominance of low frequencies, and it is these features which characterize it as "sharp."

It is felt that the technique will be considerably improved and its uses expanded.

Maxwell