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Aside from the demonstration of the participation of glutathione in transpeptidation reactions, there appears to be little additional evidence supporting the attractive hypothesis that glutathione acts as an intermediate in the biosynthesis of other peptides and proteins. If the tripeptide is involved as the hypothesis suggests, however, the relative metabolic activity of liver glutathione and total protein nitrogen in rapidly growing immature normal rats, which are actively engaged in the synthesis and accumulation of body protein, might be expected to differ considerably from that in normal adult rats. We have studied this aspect of glutathione metabolism following a 2-hour period of assimilation of intraperitoneally administered $^{15}N$ labeled glycine. The percentage of administered $^{15}N$ found in the nitrogen of liver glutathione isolated from tissue obtained from normal adult rats and from hypophysectomized immature rats is markedly reduced when such animals are stimulated with growth hormone. This appears to be largely due to an increase in the size of the metabolic pool of liver glutathione. The relatively low percentage of administered $^{15}N$ found in the nitrogen of liver glutathione obtained from rapidly growing immature normal rats compared with that obtained from normal adult rats, on the other hand, can be accounted for only partially in terms of the dilution effect of a larger metabolic pool of glutathione. The $^{15}N$ enrichment of the nitrogen of total liver proteins of rats in normal or induced states of growth, during the 2-hour period of assimilation of the $^{15}N$ glycine, is not significantly different from that observed in rats in which the growth process has been arrested.


To study the effectiveness of B-sitosterol on the regression of cholesterol atherosclerosis, 30 female albino rabbits were maintained on a stock diet supplemented with 1% cholesterol. At the end of 3 months, 10 rabbits were sacrificed, and the remaining 20 rabbits divided into two groups for regression study. One group received the stock diet; the other received the stock diet plus 2.5% B-sitosterol. At the end of a 4-month period, the rabbits were sacrificed, and samples of liver, aorta, and blood removed for evaluation. The data obtained from the determinations, showed: (1) B-sitosterol increased the rate and degree of plasma cholesterol regression; (2) During the development of atherosclerosis, liver cholesterol reached very high levels, which regressed to near control values in four months; (3) At the end of the 4-month treatment period, there was no evident aorta lipid, cholesterol or plaque regression in either of the groups — B-sitosterol treated or control.

Diagnostic transduodenal biliary drainage will give positive evidence of postcholecystectomy biliary lithiasis in about one-half of the cases in which stones are actually present. A positive test is definite evidence that stones exist, but a negative test is not significant clinically. The presence of significant abnormalities in the extrahepatic biliary tract shown by intravenous cholangiograms is usually confirmed at subsequent surgery. The value of this examination is limited in that it is not satisfactory for diagnostic purposes in a number of patients with postcholecystectomy symptoms. Both diagnostic transduodenal biliary drainage and intravenous cholangiography are of real value in the evaluation of the problem patient with postcholecystectomy symptoms. Both have distinct advantages and also limitations. The two tests are complementary, and each has an important place in diagnosis. These tests are only aids and are to be used to supplement the sound clinical evaluation of the patient with postcholecystectomy symptoms.


A case is reported of an elderly patient who suffered permanent flaccid paraplegia after general anesthesia and probably attributable to a period of serious hypotension and pre-existent arteriosclerotic disease of the anterior spinal artery. Also presented is a review of literature indicating other cases of paraplegia after general anesthesia. It is suggested that the anatomic location and source of supply for arterial blood to the spinal cord may account for these unfortunate sequelae.


Perforation of the bowel from trauma to the intact abdomen occurs with sufficient frequency that most surgeons personally encounter several cases. The high mortality rate, 61% of all reported cases between 1935 and 1942, hinges upon delay in operative intervention and closure of the perforation. In our series, when the interval between injury and operation was greater than 12 hours, 4 of 6 patients died; whereas, only 2 of 14 died when the interval was less than 12 hours. Certain characteristics of the lesion itself hinder early operation and closure. These characteristics are the size of the lesion, its location, and the apparently insignificant trauma which is sometimes involved. An analysis of 20 patients is given. Experimental observation of the abdominal contents after external injury is reported on ten dogs. Beside the need for early operative intervention in cases of nonpenetrating traumatic intestinal perforation, we wish to stress the importance of searching for small bursting lesions by careful inspection of both sides of the small bowel throughout its length, as well as the more obvious areas of lacerated bowel and torn mesentery.

This paper summarized the differential diagnosis of six syndromes typically classified as collagen diseases. The relative incidence of these was given as follows: Rheumatoid arthritis 90, rheumatic fever 22, lupus erythematosus 4, periarteritis nodosa 3, dermatomyositis 1, and scleroderma 1. The collagen diseases are characterized by widespread focal lesions of connective tissue. They differ individually as to sites of predilection, and there are quantitative histopathological differences in the lesions. However, there is sufficient overlap that at times two or more collagen diseases appear histologically and clinically indistinguishable in their manifestations. This is more likely during early stages than later. Even more commonly, initial manifestations more or less characteristic of one collagen disease (e.g., rheumatoid arthritis) may evolve into those typical of another (e.g., lupus erythematosus). It is seldom difficult to relegate a full-blown collagen disease into its specific niche after observing its course long enough, although occasionally several years of observation may be required for certainty. Each syndrome is described with attention to its most important symptoms and signs.


Volumes have been written about the technical aspects of oral surgery with little attention devoted to the humane aspects of patient care. There is, of course, continuing need for technical improvement, but more emphasis should be placed on patient management and public relations. Since it is well recognized that most people are fearful of the various surgical procedures that are carried out in a routine oral surgery practice, it is well to recognize this with adequate sympathetic understanding of their position. All auxiliary personnel should function, not only with efficiency, but with a degree of charm and compassion that is commensurate with the physical and mental trauma that the patient must endure. Efficient expertly administered local or general anesthesia followed by postoperative sedation are, of course, imperative. Clean, attractive modern surroundings are also of great importance if an optimum end result is to be attained.


The accuracy and practicality of refraction with the Rodenstock Refractometer has been evaluated. This objective method has been compared to the customary subjective methods of manifest and cycloplegic refractions. Four hundred and seventy-nine eyes of 242 patients were refracted by the three different methods, representing a total of 1226 refractions (on some patients either the cycloplegic or the manifest refraction was omitted). The results have been recorded in graphic form. The non-cycloplegic Rodenstock refractions agreed closely with the customary manifest refraction and the cycloplegic refraction. A Rodenstock refraction had a lower average error due to accommodation in comparison to the cycloplegic refraction than did the average manifest refraction, but large errors in refraction may sometimes occur with the
Rodenstock Refractometer. There are also valid criticisms of the practicality of the Rodenstock Refractometer.


The result of the present tissue culture study indicates that Nystatin, under the conditions of the experiment, fulfills the requirements of a good *in vitro* antimonilial agent; i.e., it inhibits proliferation of *C. albicans* at concentrations of 50 units and probably kills the organisms at 100 units per ml. of culture medium; and it produces no harmful effects on human epidermal cells at these concentrations. It has a considerable margin of safety. It begins to produce toxic effects on epithelial cells at concentrations higher than 500 units and does not cause complete injury until a concentration of 5000 units is reached.


Myocardial infarction is rare in women of premenopausal age and rarer in such women without diabetes mellitus, hypertension or systemic disease affecting blood coagulation or blood vessel structure. This is in striking contrast to men of comparable age in whom myocardial infarction, due to spontaneous atherosclerosis, is not at all uncommon. Records were reviewed of 146 women admitted consecutively to the hospital with myocardial infarction. The average age at menopause in 108 of these patients was 47.4 years, and the average interval between the time of the menopause and the time of the initial attack of myocardial infarction was 16.6 years. The discussion is devoted primarily to the effect of estrogens on cholesterol metabolism and experimental atherosclerosis. Estrogens, however, do have other important effects through their influence on vascular tone, electrolyte metabolism and constitutional development.


When purified prothrombin was activated by platelet cofactor I (antihemophilic factor) and platelet factor 3 the optimum calcium concentration ranged from 0.009 M to 0.04 M. This is a much broader optimum range than that found when tissue thromboplastin (lung extract) activated purified prothrombin.


The pathogenesis of epihysiolysis is reviewed, and the theory most tenable on the basis of studies to date discussed. Seven balance studies on epihysiolysis patients are presented, six of which show subnormal calcium retentions and serum phosphorus levels. In four cases in which it was employed, adequate vitamin D is shown to increase calcium retention significantly. The concept that epihysiolysis is a disease preventable by proper nutritional practice is emphasized and specified dietary regimens are suggested.

In twenty-five year follow-up study of 1100 tuberculin reactors there were discovered 39 reaction type cases. Of these, 29 were considered to have developed endogenously years after their removal from contact. A majority of these occurred in adolescence. Balance studies for nitrogen and calcium revealed excellent correlation between healing and the adequacy of nitrogen storage. A variety of conditions influencing nitrogen storage were explored, including the nitrogen requirement, focal infection, a number of the hormones, rest, and activity. It was shown that anything which affected adversely the storage of nitrogen was followed by spread or failure of healing of the tuberculous lesion; conversely healing regularly followed adequate storage even before the advent of the newer chemotherapeutic agents. A depressed retention of nitrogen immediately following the menarche in girls was considered to be one of the factors causing reactivation.


A study of myocardial infarctions, both single and recurrent, compared 234 control cases to a similar group of 121 cases treated with anticoagulants and followed over a five year period. Statistical analysis of the data by mean life estimate determinations showed:

1. Single infarct cases. The rate of death was three times greater in the control than in the treated group. The mean life estimated was 83 months in the control group and 292 months in the treated cases.

2. Recurrent infarct cases. The death rate was five times greater in the control group than in the treated group. The mean life estimate was 39 months in the control group and 204 months in the treated group.

Bleeding occurred, over a five year period in minor or major degree, 54 times in 51 patients (42.1%). In the last two years of the study, however, it was reduced to less than 2%. Major bleeding occurred in 16 cases (13.2%) with three deaths attributed indirectly to hemorrhage. The hazard from bleeding is considerably less than the risks of the disease itself, when one considers that at the end of two years 27.9% of the single infarct cases and 39.6% of recurrent infarct cases were dead, compared to 5.6% and 8.0% respectively of the treated group. At the end of four years 41.4% and 62.5% of the single and recurrent cases respectively were dead, compared to 8.4% and 12% in the anticoagulant group.


A dermatitis is a simple inflammation of the skin and is the commonest of all skin conditions. The various types of dermatitis seen in infants and children although confusing may be separated into fairly distinct clinical entities. A brief and simplified
classification is presented as an aid to the physician who has not had special training in Dermatology.

The classification of the various types of dermatitis is based on etiology as far as possible, but when necessary, distribution, morphology, history, and course of the eruption are considered. The term “eczema” is confusing and is used only as a qualifying prefix in several conditions.

The conditions discussed are: contact dermatitis, atopic dermatitis, seborrheic dermatitis, nummular eczema, lichen simplex chronicus (localized neurodermatitis), and eczematous dermatitis. A clinical description with appropriate photographs and a rational method of treatment of each of these conditions is presented.


The current literature and the case histories of 10 patients with varying degrees of respiratory illness from whom K. pneumoniae was isolated are reviewed. The following points have been derived: Predisposing diseases are important in the etiology of Friedlander’s pneumonia. Six of our patients had diabetes. Isolation of Friedlander’s basillus from a patient with pulmonary disease does not prove causal relationship. Early bacteriological diagnosis is important. Combined therapy with penicillin and streptomycin was ineffective in this series. The best antibiotic regimen is probably streptomycin plus a broad spectrum antibiotic. Chronic Friedlander’s pneumonia may resemble tuberculosis or carcinoma. The use of nor-epinephrine and/or cortisone may be lifesaving as supplemental therapy for acute overwhelming pneumonias.

*MAGNESIUM DIBASIC PHOSPHATE IDENTIFIED AS A CRYSTALLINE COMPONENT OF A URINARY CALCULUS. JONATHAN PARSONS. J. Urol. 76:228, 1956.

Magnesium ammonium phosphate hexahydrate (MgNH₄PO₄·6H₂O) is found as a constituent of urinary calculi being commonly associated with alkaline infected urine. This crystalline material often occurs mixed with one of several complex calcium phosphate compounds commonly called by general name apatite. This paper deals with the finding of a previously unreported constituent, magnesium dibasic phosphate (MgH₂PO₄·3H₂O). Comparative photographs of the x-ray diffraction patterns of the renal calculus and a chemically pure standard of magnesium dibasic phosphate confirm the tentative identification made from preexisting photographs. The crystalline interplanar spacing data pertinent to future identification of this compound are also given.


This is the third in a series of papers publishing x-ray diffraction patterns and molecular interplanar spacings for the organic compounds known as the steroids. Data and photographs for 40 compounds are included in this report bringing the total thus far studied and reported upon to 106 steroid compounds.

*From Edsel B. Ford Institute for Medical Research.

Heterologous blood was administered to dogs and rabbits in varying quantity and rates of flow in fifteen experiments. Intravenous administration of heterologous blood experimentally resulted in an abnormal bleeding tendency similar to that observed in hemolytic blood transfusion reactions in man. A critical precipitous fall of blood platelets and a small decrease in plasma fibrinogen are associated with the transfusion reaction. The bleeding time is usually prolonged and frequently the coagulation time is prolonged, but these changes usually are only of several hours duration. It appears that fibrin and platelet emboli or thrombi form in blood vessels throughout the body as a non-specific reaction, such as occurs in a number of conditions in which foreign proteins are present in the blood stream. Thrombocytopenia and hypofibrinogenemia result in a bleeding tendency. In varying situations thrombocytopenia or hypofibrinogenemia may predominate.


Fifty-four cases of intussusception due to invaginated Meckel’s diverticulum are reviewed. Important symptoms include a sudden onset of severe, cramping, periumbilical pain with vomiting, decreasing bowel movements and passage of blood and mucus. Forty-one of fifty-four patients (77 percent) presented either one or a combination of this triad of findings: an abdominal mass, a rectal mass or rectal blood. Early surgery should be urged but it presupposes early diagnosis which is of the greatest importance. More attention to the state of fluid and electrolyte balance preoperatively will help to improve the results. Surgery in critically ill patients should be withheld until proper hydration is achieved and the chemical balance is at least partially attained. The mortality rates are improving and during the past twenty years fifty-four patients were treated, with a mortality rate of approximately 20 per cent. Seven patients died. The outcome in two cases was not described. This represents a decrease of at least 15 per cent in the death rate of this condition since 1933. Adults with intussusception frequently give a long history of recurring bouts of periumbilical pain; in infants this does not hold true. Surgery is the treatment of choice and warning is given against the use of enemas to achieve reduction, since reduction of the invaginated Meckel’s diverticulum cannot be accomplished by this means. A competent ileocecal valve would further complicate the problem by preventing the medium used in the reduction from reaching the terminal ileum.
A method is described in which conventional suspension media are used to stabilize colloidal Au-198 specimens for liquid sample well scintillation counting. The technique applies some suspension methods to the systems of radiation detection. The method is rapid, by-passes lengthy digestions, and eliminates sedimentation errors encountered in the well crystal technique. Sedimentation errors are discussed briefly.


The adrenal hyperfunction which accompanies and may be a cause of retinopathy in diabetes may in turn be caused by pituitary hyperfunction. Pituitary hyperfunction, in addition, may contribute to diabetes and diabetic retinopathy directly through the diabetogenic factor, the growth hormone and other less well defined principles. Hypophysectomy, therefore, may be of value in diabetic retinopathy in two ways. Furthermore, by removal of the source of corticotrophin, reduction of glucocorticoid secretion is brought about more safely for the patient than by complete adrenal ablation, since, even in the absence of the pituitary, aldosterone secretion continued at a low level lessens the danger of electrolyte imbalance and shock. In the small series of five cases of diabetic retinopathy in whom hypophysectomy has been performed to date, results are thus far very encouraging, although the follow-up has been too short or the retinopathy too advanced to permit final decision on the value of the operation. These patients have experienced no further loss of vision. Hypertensive blood pressures have declined and repeated hemorrhages into the retina and vitreous humor have ceased. High insulin requirements have been lowered. There have been no deaths from hypophysectomy in our series. The operation is formidable, with a mortality rate of 5% to 10% indicated in the literature. The dangers involved and the probability of not being helped must be explained to the patient. Despite the risk of hypophysectomy and its subsequent requirement of glandular replacement therapy, further trial appears to be indicated. This is particularly true since diabetic retinopathy remains one of the leading causes of progressive incurable blindness.


The various regimens of medical treatment are only partially successful in relieving the vertiginous symptoms of Meniere's disease. When the attacks are so frequent and severe as to incapacitate the patient, ablation therapy should be considered. For the patient with unilateral Meniere's disease this is accomplished simply and effectively by either labyrinthotomy or intra-tympanic streptomycin. Details of the recommended techniques for each of these procedures are described. By either method the hearing which remained in the diseased ear is lost. Ablation therapy, therefore, is usually not recommended unless the threshold loss for speech reception in the diseased ear is at

*From Edsel B. Ford Institute for Medical Research.
least 40 dB, and the speech discrimination score not better than 40%. For patients with incapacitating bilateral Meniere's disease, it is imperative that all existing auditory function be preserved. This is best accomplished by parenteral streptomycin therapy, by which it is possible to create a severe but not total loss of vestibular function in both ears and save hearing.


1. Homogenates and soluble extracts of rat liver mitochondrial acetone powder catalyze the rapid, coupled oxidation of cysteinesulfinic acid (CSA) and fumarate (or malate) to yield pyruvate, aspartate, and inorganic sulfate, as well as an analogous reaction between CSA and a-ketoglutarate to yield pyruvate, glutamate, and sulfate. In preparations from heart mitochondria the same reactions occur, except that the sulfur moiety of CSA accumulates as sulfite.

2. The reactions above have been shown to involve rapid transaminations of CSA with a-ketoglutarate or oxalacetate. B-Sulfinylpyruvate, the product of these transaminations does not accumulate in the preparations but is cleaved to pyruvate and sulfite. The latter is oxidized to sulfate by sulfite oxidase in liver preparations but not by heart mitochondria.

3. The very slow formation of oxalacetate from fumarate or malate by malic dehydrogenase in the mitochondrial system is greatly enhanced by the presence of CSA, by virtue of the rapid and complete removal of oxalacetate in the transamination reaction.

4. Highly purified glutamic-oxalacetic transaminase catalyzes the reaction of CSA and a-ketoglutarate more rapidly than the transamination between aspartate and a-ketoglutarate. It is suggested that the observed transamination of CSA with oxalacetate and a-ketoglutarate may be the result of the action of glutamic-oxalacetic transaminase.

5. Another, apparently non-transaminative, oxidation of CSA to pyruvate, sulfate, and ammonia has been observed in fresh rat liver mitochondrial acetone powders. The reaction is DPN-dependent. It is suggested that the initial steps may be the anaerobic dehydrogenation of CSA by a DPN-linked enzyme to B-sulfinylpyruvate and ammonia and that the further metabolism of the keto acid is identical with that occurring in the coupled reactions described.

6. It is pointed out that these results and other data in the literature confirm the view that the mineralization of the sulfur moiety of cysteine in liver occurs at the oxidation level of CSA and entails cleavage of B-sulfinylpyruvate to sulfite, followed by the action of sulfite oxidase.

7. The central position of transaminations involving CSA in the interrelations of carbohydrate and sulfur metabolism is discussed.

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High resolution electron micrographs of samples of colloidal alpha iron are shown. According to prescribed conditions the samples occur as (1) particulates (with potential application in medicine) with mean diameters 900 angstrom units and less, (2) large, well-formed dendrites useful wherever strength of the dendrite is a desirable quality, (3) shorter, more fragile dendrites, (4) serrated or nodular rods and/or (5) needles. Materials of types 4 and 5 are particularly valuable for magnetic purposes and on test demonstrate intrinsic coercive forces of more than 1650 oersteds. The central stems are a line of single iron crystals which are 100 to 500 angstrom units in diameter. A fine laminar structure is often observed in the single crystals and some of the secondary branches. These appear to be 40 to 50 angstrom units thick with 20 to 25 angstrom units between the layers. The same laminar structure is often observed in large, hexagonal platelets which occur in some samples. Stereoscopic studies show that the dendrites are three dimensional with their branches and main stem not in the same plane. X-ray diffraction detects alpha iron plus some form of Fe₂O₃ in most samples.


The electron microscopy of shadow-cast, ultra thin tissue sections from which the embedding has been partially removed by electron bombardment is considered. The effects of heat, coupled with those caused by action of electrons upon the molecules of embedding material, are discussed with reference to removing the embedding plastic, and the phenomenon of "electron fixation" is mentioned. The advantages of shadow-casting sections from which the embedding has been partially removed are illustrated by a thin section of mouse testis and a thick section of hair cells from the utricle of the cat.


Sixty-one pregnancies in forty diabetic mothers have been reviewed. After viability, there is a fetal salvage of 68.8 per cent in our series. The incidence of preeclampsia is 37.7 per cent, polyhydramnios 20 per cent, and ketoacidosis 19.7 per cent. The fetal survival was adversely affected by the last but not by the first two. Early timed delivery has been practiced during the time covered by this study. The overall fetal survival using caesarean section is 88 per cent. Assiduous diabetic control and prenatal care followed by early timed delivery employing caesarean section appears to be the plan of management most likely to result in a successful outcome in the average case. The role of female sex hormones is controversial, but they probably should be used in selected cases. Sterilization and interruption of pregnancy in the average case are not indicated. Only by close co-operation between internist, obstetrician and pediatrician will the present tragic fetal loss be eradicated.

*From Edsel B. Ford Institute for Medical Research.
T waves are normally positive in right precordial leads only during the first twenty-four hours of postnatal life and then in a small percentage of cases after the first decade. There is a direct correlation between the incidence of positive T waves in right precordial leads and elevation of right ventricular mean pressure, hypothetical in the case of the normal newborn, proved numerically in cases of pathologic right ventricular hypertrophy after the first day of life. Three precordial lead patterns are described which, in infancy at least, correspond within certain limits to progressive degrees of right ventricular hypertrophy. The first is represented by a single-peaked RS deflection of normal measurements, followed by a positive T wave in leads from the right side of the precordium. The second is represented by the superimposition on the former pattern of right bundle branch block, in which the detection of pathologic right ventricular hypertrophy is certain from the configuration of QRS, but with inverted T waves in leads from the right side of the precordium. The third is represented by an R wave of 100 per cent amplitude (of RS), frequently preceded by a true initial Q wave, and followed by a positive T wave in right precordial leads. A fourth pattern which has been described is represented by the so-called “barrage” type of Donzelot, with right ventricular potential variations (of right ventricular hypertrophy plus right bundle branch block) extending across the entire precordium. With QRS or T-wave evidence of right ventricular hypertrophy in right precordial leads, the occurrence of T-wave inversion in leads from the left side of the precordium, with or without the administration of digitalis, constitutes strongly presumptive evidence of associated left ventricular hypertrophy, if these leads (V₅ or V₆) represent the potential variations derived from the epicardial surface of the left ventricle. In infants with electrocardiographic evidence of predominant left ventricular hypertrophy, the presence of positive T waves in right precordial leads is considered evidence of associated right ventricular hypertension (and probably hypertrophy) if the amplitude of R in Lead V₁ equals or exceeds 40 to 50 per cent of the total amplitude of RS in the same lead. The probability of this sign indicating associated right ventricular enlargement decreases as the R wave amplitude in Lead V₁ decreases to 20 or 30 per cent or less of the total amplitude of RS in this lead. The observations reported herein, and their significance, are not necessarily limited to the period of infancy. However, in order to establish accurate diagnostic criteria for older children and adults, separate numerical criteria will have to be established for each successive age group.