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In view of the increasing interest in certain strains of *Escherichia coli* in relation to ulcerative colitis, the antibody responses to three strains (014, 055 and 0111) were studied in 86 patients by the indirect hemagglutination technique. The antibody titers of *Escherichia coli* 055 and 014 in colitis patients corresponded to those of the healthy population whereas 45% of patients had increased titers of *Escherichia coli* 0111, one of the more frequent strains in the Detroit area. It is suspected that the antibody reaction against certain strains of *Escherichia coli* depends on their local incidence and that increased titers are not specific for ulcerative colitis.


Involved facial tissues of better than four years' duration were treated ten years ago. To date the resolution of this process has persisted. The lymphedema per se was partially ameliorated by elevation of the bed at night and the use of penicillin G per os. This was followed by Jobst pumping of the face after a suitable mask was prepared for this patient. The nature of this process is reviewed and the factors involved discussed.


The results of operation for patients with thyroid carcinoma, excluding the poorly differentiated variety, producing widespread involvement of the neck region indicate that more extensive procedures, including total or near-total thyroidectomy and a cervical lymph node dissection on at least one side of the neck and anterior superior mediastinum, reduce the recurrence and mortality from this carcinoma. Thus, of 47 patients with this extent of carcinoma treated from 1952 through 1967 with total thyroidectomy and appropriate lateral cervical and anterior superior mediastinal lymph node dissection, carcinoma has reappeared in the neck or mediastinum in five patients, during follow-up periods averaging 7.9 years, with a single death occurring from medullary thyroid carcinoma. In contrast, of 19 patients with a similar extent of disease treated by lesser operative procedures during the same time period, recurrence developed in the neck in nine, in the mediastinum in four, and two died from thyroid carcinoma during follow-up periods averaging 12.5 years. Furthermore, of 32 patients with a similar extent of thyroid carcinoma treated with lesser operative procedures from 1924 through 1951, 17 developed recurrence in the neck and 12 died from the carcinoma during follow-up periods averaging 11.2 years. A policy is advocated of adapting the extent of operation to the evidence of gross extent of thyroid carcinoma at
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the time of the surgery. Although the preoperative presence of cervical lymphadenopathy usu­
ally dictates the need for cervical lymph node dissection, the status of the nodes, particularly
in the tracheo-esophageal groove and anterior superior mediastinal regions, is best
assessed at the time of operation.

Medullary thyroid carcinoma detected by serum calcitonin assay. M. A. Block,

Elevated levels of calcitonin in serum were found in 14 of 48 members studied from two
kindreds with familial medullary thyroid carcinoma. Thirteen of these individuals have
subsequently been operated on and the presence of the malignancy confirmed, in seven
of them before it was detectable by other examinations. Serum calcitonin determinations
are a valuable screening procedure for diagnosis and follow-up studies after operation.
The degree of elevation of this polypeptide in the serum appears to correlate with the
extent of disease. Since hyperplasia of parathyroids often develops in association with
familial medullary thyroid carcinoma, and parathyroid tumors (present in four patients in
this study) may occur, the parathyroid glands should be evaluated at operation and grossly
abnormal glands removed.

Plasma renin and blood pressure after sympathetic stimulation in normotensive
and hypertensive patients. J. R. Caldwell and O. A. Carretero. Amer J Cardiol,
29:466-9, Apr 1972.

We have investigated renin release and blood pressure in basal conditions, after six
consecutive cold pressor tests and after two hours of upright posture in 10 normotensive
subjects and nine hypertensive patients who had received a 10 mEq sodium diet for three
days. After cold pressor tests, normotensive subjects showed no significant change in plasma
renin activity, whereas hypertensive patients had increased plasma renin activity. After two
hours in the upright posture, both groups showed a significant increase in plasma renin
activity. The increase in plasma renin activity in the hypertensive patients after cold pressor
tests suggests that these patients have an increased sympathetic nervous system response to
noxious stimuli and that this enhanced sympathetic response is manifested by an increase
of plasma renin activity over the basal level.


The efficacy of renal revascularization has been established in the treatment of hyper­
tension resulting from stenosis of the renal artery or its branches. The most commonly per­
formed type of renal revascularization is aorto-renal bypass. While autogenous saphenous
vein is preferred for this purpose, the use of prosthetic materials may be necessary under
certain conditions. Two patients are presented, each of whom underwent right renal
revascularization with a teflon graft. Postoperatively, thrombosis of the graft occurred, re­
quiring secondary nephrectomy. In one patient, the teflon graft was ligated and the kidney
removed, in another the teflon graft was taken off its origin from the aorta, and a teflon
pledget placed on the aorta. Each patient subsequently developed aortoduodenal fistula, with
massive hemorrhage into the gastrointestinal tract, one year following nephrectomy and
two months following nephrectomy, respectively. The two patients described in this paper are
the first reported cases of aortoduodenal fistula following nephrectomy for thrombosis of an
aorto-renal bypass graft. It seems probable that in each case pulsatile erosion of the duodenum
by the teflon remnant occurred. It may be postulated that once erosion of the bowel wall
had begun, focal necrosis of the duodenum developed. It is stressed that should thrombosis
of a teflon aorto-renal bypass occur, and nephrectomy be necessary, all prosthetic material
be removed. In addition, tissue should be interposed between the duodenum and aortic
suture line.
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An 11-year-old white boy had symptomatic erythropoietic protoporphyria (EPP) and Klinefelter's syndrome. To the authors' knowledge, this is the first report of such an association. The patient's relatives were screened for EPP with use of fluorocyte counts. Erythropoietic protoporphyric patients with active disease respond poorly to antihistaminics, antimalarials, and topically applied sunscreens. Recently, however, beta-carotene has been shown to be effective in suppressing the photosensitivity of these patients. Consequently, our patient was instructed to drink three to four large glasses of carrot juice or mixed vegetable juice daily. He became carotenemic within three weeks and his sunlight tolerance increased from 10 to 30 minutes to an almost indefinite exposure time.


The patient was an obese woman who was struck by an automobile while standing in a "safety zone". She sustained multiple fractures of the left leg and a ligamentous injury of the right knee. She was short of breath and a film of the chest showed the left pleural cavity to be nearly totally filled with abdominal viscera. After immobilization of the lower extremities, prompt left thoracotomy revealed an extensive hernia of the diaphragm involving both left and right leaflets and the pericardial portion. She recovered after a stormy postoperative course which involved respiratory assistance by tracheostomy for three weeks. Definitive orthopedic procedures were carried out two months after the accident, and an operation for non-union of the fracture of the femur was done a year later. No record of such an extensive rupture of the diaphragm was found in the review of the available literature.


With increasing frequency, laparoscopy is being used in diagnosis and treatment. This report, surveying experience with 182 patients, emphasizes the safety and usefulness of laparoscopy. The indications and contraindications are reviewed with specific attention to the conditions which do not enhance the usefulness of the laparoscopy and decrease its effectiveness. Problems related to pneumoperitoneum, previous surgery, infertility, chemotherapy, ectopic pregnancy, pelvic mass and pelvic pain are considered in detail as they relate to laparoscopy. Of particular interest is the usefulness of the laparoscope for excluding extra uterine pregnancy. The distinct knowledge that no extra uterine pregnancy exists leads to more accurate management of patients with preplexing problems of vaginal bleeding, possible pregnancy and pain. From the negative standpoint, when a distinct pelvic mass of significant size was palpable, the laparoscope added little additional diagnostic information. From a pragmatic viewpoint, the technique of laparoscopy can be readily learned by a physician practicing gynecologic surgery. Interpretation of findings is not difficult; however, achieving maximum benefit from the laparoscope requires frequent utilization and a high degree of efficiency.


Catecholamine excretion in urine was assessed in a group of unstressed acyanotic infants and children and in a comparable group of children with cyanotic forms of congenital heart disease. Twenty-four hour excretion of epinephrine (E), norepinephrine (NE), 3-methoxy-4-hydroxymandelic acid (VMA), dopamine (DA), and metanephrine and normetanephrine combined (MN + NMN) was measured in all individuals. Significant elevations of DA
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were found in the cyanotic patients when compared with the controls, with control values being 8.53 µg/kg/24 hr compared with values in the cyanotic subjects of 17.09 g/kg/24 hr (P<0.001). Likewise, MN = NMN values were significantly elevated in the cyanotic subjects, control values being 43.25 µg/kg/24 hr and those of the cyanotic patients 90.51 µg/kg/24 hr (P<0.025). The E, NE, and VMA values showed no significant differences, although in the cyanotic patients the tendency was of elevation over control values. The presence of elevated amounts of DA in the urines of cyanotic individuals indicates an increased release of this neurohormone in the stressed individuals. The presence of elevated amounts of MN + NMN in the urine of cyanotic patients further supports this finding and indicates that secretion of E and NE is in actuality also increased.


There are scattered reports of patients with hypocalcemia and hyperphosphatemia in association with roentgenologic and histologic evidence of osteitis fibrosa. It is postulated that the underlying defect is a renal resistance to parathyroid hormone with a skeleton that is sensitive to the remodelling effects of parathyroid hormone, resulting in the bone defects of hyperparathyroidism. Two patients with a normal phenotype but with these clinical features are described. A secondary hyperparathyroid results from the renal resistance to parathyroid hormone. The condition probably represents a variant in the clinical spectrum of pseudohypoparathyroidism. A new classification of syndromes is described, depending upon whether or not the resistance to parathyroid hormone is 1) in the kidney, 2) in the bone, or 3) in both bone and kidney. The incidence is probably greater than has been recognized. To detect additional cases, all patients with biochemical findings of hypoparathyroidism, irrespective of the somatic features of pseudohypoparathyroidism, should have a careful roentgenologic survey of the skeleton. Additional study of bone biopsy specimens, parathyroid hormone end-organ resistance and measurement of plasma levels of parathyroid hormone will undoubtedly uncover individual variations in a continuous disease spectrum.


The author describes a manner of exposing illnesses of psychogenic or somatic origin with a high degree of confidence. A problem arising commonly in orthopaedic practice and frequently entangled with legal proceedings, it is based upon examining by two separate means some particular objective phenomenon such as muscle weakness, range of motion, back tenderness, and the like. In the first of these ways the patient is allowed to exercise voluntary control over the result of the test, and in the second it is performed in such a way that the patient remains totally unaware of it. When the first or direct test agrees in substance with the findings of the second or indirect test, somatic disease is indicated, but when the outcome of the indirect and direct tests conflict, psychogenic disability is exposed. This procedure in no way evaluates the presence or absence of malingering.


Post-traumatic renal artery aneurysms are rare and often not recognized until nephrectomy is the only possible therapy. An unusual case of traumatic segmental renal artery aneurysm in a solitary kidney, with calyceal fistula, blood clot ureteral obstruction, and acute renal failure is presented. Renal angiography showed an intrarenal aneurysm of the anteromedial segmental artery, with calyceal communication, in a solitary left kidney. At operation clip ligation of the aneurysm was performed in preference to nephrectomy or segmental nephrectomy. The postoperative course was uneventful, renal function returned to normal and blood
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Pressure has remained in normal range. This case underscores the value of angiography in selected cases of renal trauma. While the intravenous pyelogram in this patient was normal, save for clot obstruction, the aneurysm itself was apparent only in the angiogram. Although it is highly unlikely that the unique factors which made up this case will appear often, the management of this patient may be applicable to other situations.


Individual humoral immune status in 126 institutionalized retarded children (55 mongoloids and 71 others) were evaluated for quantitative and qualitative aspects of immunity. Quantitation of the major immunoglobulins (IgG, IgM, and IgA) in serum was measured by micro-double diffusion technique and quality of immunoglobulins was evaluated for specific antibody responses against common micro-pathogens. By immunoglobulin classification, the children studied demonstrated normal and excessive quantities of immunoglobulins, especially excesses in IgG and IgA. The antibody responses to enteric bacteria were found to be higher in the study groups than those established titers found in an asymptomatic population. Systemic humoral immune status of mongoloid children as well as non-mongoloid retardates were quantitatively and qualitatively competent to respond to antigenic stimulation to the micropathogens studied.


A variety of experimental technics has been used to determine gastroesophageal reflux, including manometery, roentgenography, acid perfusion, esophagoscopy and pH reflux test. No single method has generally been accepted as a standard test. Based upon available evidence, monitoring pH in the esophagus currently represents the most sensitive method for measuring gastroesophageal reflux. This clinical investigation was undertaken to determine if an intraesophageal pH electrode would provide a more sensitive means for the detection of gastroesophageal reflux, and to study the esophageal and gastric pH in normal subjects as well as in patients with hiatus hernia. In this report the method and the clinical applications have been described and the results are presented of 48 experiments in 11 normal subjects and 17 patients with hiatus hernia and symptoms suggestive of esophagitis. The esophageal pH ranged from 6 to 6.5 in normal subjects and 4.5 to 6.5 in the study group. The gastric pH ranged from 1.9 to 3.8 in normal and 1 to 3.2 in the control group. The location of gastroesophageal junction, as indicated by a sharp pH gradient zone, was determined at 42 to 45 cm from the nostril in 98% of the cases. This test proved to be a simple procedure and a more sensitive means for the detection of gastroesophageal reflux. In this study pH monitoring proved to be 41% more sensitive in determining gastroesophageal reflux than the standard roentgenographic technic.


The diagnosis "acne" embraces many variants of a disease which involves the pilosebaceous system of the skin. Well-recognized severe forms include acne conglobata, cystic acne and tropical acne, all of which are resistant to treatment. A particularly disabling, but fortunately less common, variant is acute febrile ulcerative acne with polyarthralgia, which is associated with considerable toxicity. The features of this type are (a) sudden onset (b) severe ulceration (c) toxicity as demonstrated by fever and polyarthralgia (d) failure to respond to usual antibiotic therapy, and (e) favorable response to debridement in combination with steroid therapy. Despite the response of the acute cutaneous manifestations of this disease, episodes of mild recurrent arthralgias and malaise may persist for many years. Three patients are described and the course of the disease and its treatment discussed.
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A micromethod was developed to measure kininogenase activity in urine. It is based on the enzymatic property of the urinary kallikrein which releases peptides (kinins) with a vasodilator effect when incubated with substrate (kinogen). The method consists of the incubation of 1 ml urine with plasma substrate preparation for 20 min. at 37°C. The kinins released are estimated by comparing their vasodilator effect on the perfused hind leg of a dog with the vasodilator effect of a standard preparation of synthetic bradykinin. To inactivate the kininases present in the urine and plasma, the latter was heated for 3 hr at 56-58°C and phenanthroline was then added to the incubation mixture. The heating of the plasma also inactivates the kallikrein inhibitor and the plasma prekallikrein. With this method, kininogenase activity was measured in eight normal rats from which urine had been collected in 24-hr periods for 3 days. The average activity for each day was 1.64 ± 0.26 (SEM), 1.65 ± 0.13, and 1.64 ± 0.18 µg bradykinin/ml urine per min incubation.


This protein-losing enteropathy of apparent congenital origin occasionally requires an abdominal operation to establish the diagnosis. Diagnosis requires demonstrated dilated lymphatics in the wall of the intestine after elimination of numerous other causes of its clinical manifestations, not always provided by peroral mucosal biopsies of the intestine or other currently available procedures. Of three patients having this disease, two presented primarily with chylous ascites and the third had an unusual manifestation of blood loss from the intestine. Since primary intestinal lymphangiectasia is only one prominent manifestation of a congenital hypoplasia of lymphatics which is variably diffuse in its anatomic distribution, rarely restricted to a segment of the intestine, resection of an intestinal segment or other operative procedures are not of real benefit. The abnormality of intestinal lymphatics appears to result in steatorrhea as a prominent manifestation in some patients, whereas chylous ascites dominates in others. Lymphangiograms can be of value in indicating extent of the disease. Dietary restriction of fat to medium chain triglycerides and supportive measures are helpful in controlling manifestations. Spontaneous remissions are common.


The incidence and progression of renal osteodystrophy and soft tissue calcification in 16 patients undergoing maintenance hemodialysis (MHD) for 8 to 38 months at Mount Sinai Hospital, Los Angeles, were determined by clinical and roentgenographic observation. The most common symptom was pruritus, which occurred in every patient. Ocular, periarticular or arterial calcification, usually asymptomatic, appeared or worsened during MHD in at least 13 patients. Roentgenographic signs of hyperparathyroidism were present in 9 of 10 patients who underwent dialysis for more than one year, and appeared or progressed during dialysis in at least five. Stress fractures and reduction in bone density occurred in three patients. The mean serum levels immediately before and after dialysis were calcium 9.16 and 10.28 mg/100 ml, inorganic phosphate 7.94 and 3.85 mg/100 ml, blood urea nitrogen 87.5 and 25.7 mg/100 ml, and creatinine 12.97 and 5.08 mg/100 ml. The increment in serum calcium during dialysis was partly due to the high calcium level of the dialysate (6.87 ± 0.58 mg/100 ml), but there was considerable variation between patients which was only partly explained by individual differences in the correction of hyperphosphatemia and uremia. Although some patients showed a fall in predialysis serum phosphate levels in the first few months, high levels eventually developed in all; this constituted the most striking difference between the present series and that reported from Fulham Hospital, London, in which the incidence of osteodystrophy and soft tissue calcification was much lower. This difference
resulted partly from insufficient ingestion of phosphate-binding antacids and inadequate control of dietary phosphate intake, but it may also have reflected a more severe disorder of parathyroid cell proliferation (mitotic autonomy) in uremic patients in Los Angeles than in London.


On the basis of the response to EDTA-induced hypocalcemia and the pretreatment plasma calcium level, 5 grades of severity of hypoparathyroidism are defined. The plasma levels (mean ± SE in mg/100 ml) of calcium (Ca) and phosphorus (P) in 62 patients with surgical hypoparathyroidism (SHP) from a single hospital were: Grade 1-Ca 9.29 ± 0.09, P 3.49 ± 0.11 (n = 11); Grade 2-Ca 8.80 ± 0.06, P 3.58 ± 0.24 (n = 10); Grade 3-Ca 8.06 ± 0.08, P 3.85 ± 0.17 (n = 14); Grade 4-Ca 6.99 ± 0.06, P 4.96 ± 0.18 (n = 22); Grade 5-Ca 5.62 ± 0.16, P 5.97 ± 0.23 (n = 16). Nine patients were included in two or more grades on different occasions. There was a significant inverse correlation between Ca and P levels (r = 0.748, p 0.001). Comparison of the results with those from other series of SHP, idiopathic hypoparathyroidism (IHP) and pseudohypoparathyroidism (PHP) suggests the following conclusions: 1) There is a clear demarcation of abnormal from normal plasma Ca levels in IHP, but not in SHP or PHP. 2) IHP is on the average a more severe disorder than PHP which in turn is more severe than SHP. 3) The plasma P level falls with increasing age in IHP and in normal subjects but not in PHP. 4) Plasma P levels in adults are the same in IHP and SHP for the same degree of hypocalcemia, but are higher in PHP than in either SHP or IHP. 5) Mild (grade 3) cases of SHP are characterized by hypocalcemia, normophosphatemia and a high rate of spontaneous improvement with time, whereas mild cases of PHP may have normocalcemia and hyperphosphatemia. 6) The plasma P in IHP, PHP and SHP is higher in the United States than elsewhere. 7) A fall in parathyroid hormone secretion has a progressively greater effect on the plasma P level as zero secretion is approached. 8) Most patients with SHP retain some functioning parathyroid tissue even after many years. 9) Failure of this tissue remnant to regenerate may be partly due to permanent parathyroid ischemia as a result of thyroid surgery.


Megacolon generally becomes manifested during infancy or early childhood. Four patients 16-21 years of age received excellent results following the performance of the Swenson Pull-through procedure. Classical megacolon presents no great problem in diagnosis, but not all patients with megacolon present the classical and pathological picture. Every patient with severe constipation and megacolon deserves a thorough evaluation and appropriate treatment.


Lipid and lipid-free tissue ratios have been accurately determined using dual beam X-ray absorptiometry, with $^{106}$Cd as the source of radiation. Its Ag $K_\alpha$ doublet (22.162 and 21.988 keV) and the 87.7 keV $\gamma$ provide greater sensitivity for detection of tissue components (by a factor of 2.6) than $^{125}$I and $^{241}$Am. Beam monochromaticity, essential for differential absorptiometry, is simply achieved with Pd filtering. Body composition ratios were measured with $^{106}$Cd on in vitro animal tissue samples to an accuracy of 2 per cent.
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The symptoms of gallbladder disease are reviewed with emphasis upon the character of the pain as referred from the parietal peritoneum and distinct from true visceral pain. The author analyzes the management of cholecystitis with and without stones and the complications of gallbladder disease associated with diabetes mellitus and coronary artery disease. It is possible to identify supersaturated bile in potential stone formers. The formation of gallstones is considered from the newer knowledge of lithogenic bile, in the hope we are approaching an era of rational medical therapy.


The authors studied 11 patients with the hypoplastic left heart syndrome, defined as atresia of the aortic or mitral valve, or both, with normally related great arteries and intact ventricular septum. Group I (8 cases) comprised patients with early distress, ashen cyanosis and feeble or absent peripheral pulses in the presence of a hyperdynamic precordium and death in the first week of life. Group II (3 cases) comprised patients with good peripheral pulses, marked cyanosis and survival for more than one week. Both groups had characteristic electrocardiographic and radiographic findings. In Group I, values for pulmonary oxygen saturation were elevated with pressures moderately increased, whereas in Group II, oxygen saturation values were greatly lowered with markedly increased pressures. All patients had hypoplastic ascending aorta, large patent ductus arteriosus and diminutive left ventricle, left atrium and foramen ovale. Three of eight had abnormalities of the coronary sinus. A positive correlation can be made between the clinical appearance and the hemodynamic findings which may allow selection for palliative surgical procedures.


Use of a mechanical food pump in conjunction with a small-bore polyethylene tube has heightened the usefulness and improved toleration of tube feeding. When necessary, the tube can be placed beyond the point of obstruction in the mouth, esophagus or stomach, in order to maintain alimentation. With this method and a properly selected diet, the patient will receive adequate calories and have less derangement of electrolytes than with intravenous feeding. The materials available for feeding and the means of avoiding complications from tube feeding are discussed.


A 65-year-old white man with chronic granulocytic leukemia manifested a variety of worsening atrial rhythm disturbances during his progressive clinical deterioration over a one-year period. At autopsy, leukemic infiltration involving the sinus node was evident. It is tempting to assume a cause and effect relationship from these findings. Unexplained abnormalities in cardiac rhythm in patients with leukemia should alert the clinician to the possibility of involvement of the heart by cellular infiltrate or hemorrhage. Such knowledge might help curtail the morbidity of these patients, for sometimes the arrhythmia may be amenable to local, palliative treatment.
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Previous statistical studies by the authors lent strong support to an aggressive policy of case selection in the surgical treatment of asymptomatic abdominal aortic aneurysms. To test further the value of narrow operative contraindication, they surveyed the clinical course of 156 patients with such lesions, who had been deemed unfit for surgical treatment between the years of 1952 and 1971. Among the 127 patients who never came to operation, 90 died during the 20-year followup period. Although organ-fixed atherosclerosis (mostly coronary) was the leading cause of death (55.0%), rupture of the aneurysm continued to be an important source of loss of life (27.8%). Generally, the findings corroborated the validity of an aggressive surgical approach and emphasized the prognostic threat of aneurysmal size and arterial hypertension in the nonsurgically-treated patient.


Lobav et al. in Leningrad, and workers at this laboratory have been working on the idea of using x-rays from radioactive sources for x-ray diffraction analysis. The original technique using iron-55 is described. Recently, a new and more intense source has been constructed at Oak Ridge National Laboratories. With the new source it was possible to produce LIF diffraction patterns of the same density and resolution as before, but with a reduction in exposure time from 116 hours to 20 hours and an increase in resolution by a factor of two over the data reported previously. Thus the concept of using x-rays from an isotope for powder diffraction has changed from a laboratory curiosity into a technique with practical possibilities. The application to this work of a position sensitive proportional counter as developed by Semmler is also discussed.


The surgical biopsy of the lung revealed two general types of tissue, according to ultrastructure. The first was "normal," except for minimal changes in some areas, viz the basement membrane tended to be somewhat split, thickened and edematous, and contained small amounts of collagen, the endothelium occluded some of the blood vessels, and some of its mitochondria were altered, being malformed, lacking in cristae, swollen or containing lipoid material. The second type of tissue was manifestly abnormal, possessing all of the same changes, but to a more marked degree. In addition, the usual attenuated epithelium had been replaced by large cuboidal cells and the basement membrane was frequently absent. The alveolar septa were greatly thickened to many microns, and were edematous and filled with vast deposits of collagen. Septal macrophages were frequent and contained unidentifiable crystalline inclusions, either free in the cytoplasm or within lysosomes. Large areas of collagen were identifiable with the crystals. The occlusion of blood vessels (or their absence), the proliferation of collagen and thickening of the septa, and the changes in epithelium, basement membrane and endothelium would all help explain the interference with the gas transfer mechanism in this lung.