

OPSOMMINGS VAN VOORDRAGTE : SUMMARIES OF PAPERS

GESAMENTLIKE TWEEJAARLIKSE KONGRES : JOINT BIENNIAL CONGRESS

Die volgende is opsommings van voordragte wat op die Gesamentlike Tweejaarlikse Kongres van die Suid-Afrikaanse Hartvereniging, Die Interniste Vereniging van Suid-Afrika (M.V.S.A.) en die Suid-Afrikaanse Vereniging vir Endokrinologie, Metabolisme en Suikersiekte, vanaf 5-9 Oktober 1964, in Pretoria voorgelê is:

The following are summaries of papers submitted at the Joint Biennial Congress of the South African Cardiac Society, The Association of Physicians of South Africa (M.A.S.A.) and the Society for Endocrinology, Metabolism and Diabetes, on 5-9 October 1964, in Pretoria:

OPENINGSREDE : OPENING ADDRESS

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'n Oorlewering uit die Griekse mitologie vertel dat die reus Antaeus sy krag telkens hernieu het deur met die aarde in verbinding te tree. Op soortgelyke wyse kan en word die klinici versterk deur herhaalde voeling met chemie, fisika, fisiologie of patologie. Daarmee behou hulle 'n vaste wetenskaplike grondslag en hou hulle die voete op die aarde. En dit word steeds nodiger want in hierdie ontploffende tydperk van nuwe uitvindinge, nuwe tegnieke en nuwe durf word die geneeskunde in die geselskap van slegs 'n paar ander vakgebiede steeds in die voorste lopies gevind. Enersyds is dit waarskynlik te danke aan die owerhede se wete dat die groot verbeeldingryke projekte van more veral onderworpe is aan die beperkinge van die menslike gestel wat hulle moet uitvoer. Andersyds is dit te danke aan die ingeskerpte bewuswording by die publiek weens moderne kommunikasie-middels van sy liggaam se lewensvermoëns, van sy plig om dit te versorg en van sy wil om lank en gesond te wil lewe.

Diegene wat hulle 'n bietjie nabetrachtend oor die begrip 'mediese wetenskap' wil besin, besef spoedig dat hierdie twee woorde slegs in 'n breë verband gebruik kan word. Hulle is omvattend van die hele spektrum van natuurwetenskappe met betrekking tot gesondheid—daar is geen enkele wetenskapsgebied eie aan die geneeskunde nie. Die geneeskunde is die vrug van 'n verskeidenheid van wetenskappe en word deur hulle almal gevoed. Alhoewel die mens die uiteindelijke doelwit en proefveld vir ons kenne en kunne is, dien die hele omvattende veld om ons gedagtes indringend te kondisioneer en op 'n breë vlak ontvanklik te maak om die latere kliniese proef waardig te wees. Uit die wetenskappe word dan een samebindende diensgeneeskunde gebore.

Nog meer fundamenteel as enige vertakking van kennis is die gedagte wyse, die denkhouding, wat ons steeds optimaal moet kweek in albei sy hoofaspekte, nl. die ontvanklikheid vir nuwe idees en 'n steeds vernieuende waarnemingsvermoë.

For it is this receptivity to new ideas and this capacity to make fresh observations which can keep medicine as a career perennially fresh, intellectually challenging and completely absorbing, e.g. to take a new look at the reliability of a well-used tool such as the electrocardiograph by an exhaustive, composite serial test such as that of Hinkle and his associates; to appreciate that thyroid metabolism uses among others an adenosine triphosphatase activated by Na and K, dependent on Mg, and sensitive to strophanthin; and, at the counterface, to find next to lactate as the chief energy substrate during physical effort, particularly in athletes, the thyroid hormones deeply involved in the rate of myocardial metabolism. I particularly welcome the awakened activity in the intricate field of human myocardial metabolism, not only because of a long-standing personal interest but as evidence of the need for delving into the more fundamental factors of myocardial contraction in health and in failure. A revision of the concept of cardiac tone is also most desirable with an analysis of the components in diastolic distensibility as a function of tone, e.g. tone influenced by such a variety of factors in common with systems elsewhere: the energy-rich phosphates, the enzyme group, Ca, the β -receptors for the catecholamines linking up again with the whole amine biochemistry, and metabolism which is a growing focus of interest not only in heart muscle but also in smooth muscle. And yet again we should not view vascular smooth muscle as one homogeneous tissue with a common reaction to stimuli. The different concentrations of

a tono-actinomysin-like substance in various vessel walls is a timely indication of this fact.

These few instances have been lightly touched upon merely to underline the necessity for an integrated approach to the subject of clinical medicine and to heed the sage counsel: you may not divide the seamless coat of learning. It would be absurd to consider that a vascular system, a nervous system or a heart could have a separate existence. It is only in the organized function of the living organism that they achieve reality. This interdependence or interrelationship finds confirmation in many examples, but is particularly well reflected in the multiple-endocrine and metabolic-disease syndrome. In the quality of interrelationship this society becomes sister to the Endocrine Society by virtue of a mutual interest in the heart, also to be observed as an endocrine organ. Samuel Butler once stated: 'Life is the art of drawing sufficient conclusions from insufficient premises'. He might also have been describing, somewhat poignantly, the plight of investigators seeking to understand the involved metabolic processes in intact living man.

We in our lifetime, have seen intact living man being artificially fractured and fractionated into a growing host of specialties—a process which has reached its efflorescence in the last few decades. If this is to be our guide or keynote, the modern medicine in this high-living era stands before a new projection: from geriatrics into pluriiatrics.

Die tema in die gedagtegang bly: hou bymekaar wat uit hul aard bymekaar hoort—die natuurlike integrasie van die basiese en die kliniese vakke. En waar, miskien weens tegnieke redes, die proses van vertakking, soos op chirurgiese gebied, wenslik was, moet die geneeskundige familie dit verwelkom dat 'n vak soos interne geneeskunde as samebindende element dien wat die afgeleë takke aan die stam verbind hou en die verbinding weer na ander takke kan help voer, sodat die beeld as 'n geheel nie verlore gaan nie en ons die belangrike perspektief behou.

Op enige vlak in die natuur is daar die verskynsel van oppervlakspanning, die krag wat steeds probeer om die kontakvlak tussen twee onmengbare entiteite, soos olie en water, so klein as moontlik te hou. Dit is te wyte aan die aantrekkende kragte tussen die molekule van 'n homogene bevolking en die afwesigheid van vergelykbare aantrekkende tussen heterogene molekule. Met die gebruik van 'n seeplose wasmiddel kan die oppervlakspanning tot nul verminder word sodat die twee stowwe meng en 'n bruikbare emulsie vorm. Die mate van oppervlakspanning wat daar in 'n fakulteit of hospitaal bestaan, kan gereedelik en tot voordeel opgehef word deur die wasmiddel van spanwerk in navorsing en in gemeenskaplike belang in die uiteindelijke doelwit van dit alles—die pasiënt.

Staubesand stel dit graag só: 'die lewe begin 'n vaatafsluiting'. Met die oog op die ductus arteriosus sou ons kon byvoeg: en word voortgesit deur 'n vaatafsluiting en—gedagtig aan die groot getalle vaatsiektes—word dikwels ook met 'n vaatafsluiting beëindig.

Ons mediese wetenskap benodig oop vate vir verbinding tussen sy onderdele en vir die goeie funksie van die geheel. Ek meen dat die program van u verrigtinge, wat ek graag hiermee ope verklaar, in ruim mate daarvan getuig.

In opening this conference I feel assured that the variety in the programme is a reflection of our receptivity for new ideas and the capacity to make fresh observations.

HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY

M. NELLEN, W. BECK, L. VOGELPOEL, A. SWANEPOEL AND V. SCHRIRE

Obstruction to left ventricular ejection may occur at several sites, the commonest being at valvular level. Less commonly a discrete narrowing may be caused by a fibrous band at sub-valvular level, and rarely a constriction occurs in the proximal part of the aorta above the aortic valves.

Recently a fourth type of obstructive deformity has been described, and different titles have been given by different workers, either stressing the obstructive or familial aspect. We find hypertrophic obstructive cardiomyopathy as being the most acceptable.

The first lead to the fact that functional obstruction might occur in the left ventricle was provided by Sir Russel Brock who, in 1957, described functional obstruction of the left ventricle in a patient with a gradient between the left ventricle and aorta owing to a mass of hypertrophied ventricular muscle. This was thought by him to be the result of systemic hypertension.

In 1958 Teare, a pathologist, described the condition as 'asymmetrical hypertrophy of the heart' in young adults in whom generalized cardiac hypertrophy was associated with massive bulging of the septum into both ventricular cavities, leading to obstruction of the inflow and outflow of blood.

In 1960 Goodwin and Teare described the clinical syndrome in 8 patients and in the same year described a family who presented with signs of obstruction to left ventricular outflow, the condition resembling aortic valvar stenosis. The patients had in common ventricular hypertrophy out of proportion to the existing pressure load on the ventricle.

In 1960 Braunwald and Morrow *et al.* emphasized the characteristic moment-to-moment change in the intraventricular gradient as seen on withdrawal traces from low to high left ventricle. There is also a high end-diastolic pressure attributable to stiffness of the muscle with slow and incomplete diastolic relaxation.

In 1962, and later in 1964, Braunwald reported on the haemodynamic alteration in this condition induced by isoproterenol, which has a strong inotropic effect while dilating the systemic arterial bed, and contrasted this with the effect of methoxamine, which is a peripherally-acting pressor amine with no inotropic effect. In addition, he reported on the

effect of digitalis, pronethalol (a beta-adrenergic receptor blocker), and on the effects of exercise and sublingual nitroglycerine and the valvular manoeuvre. He ascribed increase of the intraventricular gradient to reduction of ventricular dimension, and lessening of the gradient to the increase in ventricular dimension as seen by sewn-on radio-opaque clips on cine-angiography.

We have investigated 4 cases of obstructive cardiomyopathy in the Cardiac Clinic, University of Cape Town, and have studied the effects of intravenous phenylephrine or neosynephrine, a peripherally-acting pressor amine with similar action to methoxamine; inhalation of amyl nitrite and intravenous isoproterenol, and have measured the changes in intraventricular pressure gradients in all cases. However, we have paid particular attention to the alteration of the systolic murmur in these cases, which this paper mainly presents, and we have compared the effect of phenylephrine on the murmur in this condition with the ejection murmur in 10 cases of aortic valvar stenosis.

We have shown that in 3 out of 4 cases the haemodynamic responses to vasoactive drugs was as previously described and we have also shown that the change in the ejection murmur reflected the change in the haemodynamic situation. Amyl nitrite increased the gradient and intensified the systolic murmur; with phenylephrine the gradient is abolished and the murmur almost so; and with isoproterenol the gradient and the murmur is intensified.

However, in 1 case the situation was not influenced as in the above 3, and this might indicate a different syndrome or a failing unresponsive myocardium in this condition. It is possible, as has been suggested, that patients with this condition do not constitute a homogeneous group in their responses to sympathetic stimulation.

In 10 cases of discrete aortic valvar stenosis phenylephrine had a variable effect in keeping with the variable change in stroke volume—slightly increasing the murmur in 5, showing no change in 3, and a slight decrease in 2—suggesting that the narrowed orifice in aortic stenosis remains relatively fixed in contrast to the striking change in hypertrophic obstructive cardiomyopathy which it may clinically resemble.

CHIRURGIESE BEHANDELING VAN OBSTRUKSIE VAN LINKER VENTRIKULÊRE UITVLOEIBAAN AS GEVOLG VAN ASIMMETRIESE VENTRIKULÊRE HIPERTROFIE

L. DU PLESSIS, P. MARCHAND EN D. FULLER

Op hierdie tyd is daar nog nie veel bekend oor die doeltreffendheid van chirurgiese behandeling vir hierdie toestand nie. Vir hierdie rede word 2 pasiënte met idiopatiese hipertrofiese sub-aortiese stenose gepresenteer wat operasie ondergaan het.

'n Kort opsomming van die kliniese, pre-operatiewe hemodinamiese bevindings en chirurgiese tegniek is gegee. Die intra-operatiewe drukkemeterings is bespreek.

Die bevindings met linker hartkateterisasie 7 en 9 maande na operasie was beskikbaar en sekere gevolgtrekkings is hiervan gemaak.

FURTHER EXPERIENCES WITH U.C.T. PROSTHESES

C. N. BARNARD

Two and a half years have elapsed since the University of Cape Town cardiac prostheses were first developed. Some months later a similar valve was used to replace an organically diseased tricuspid valve and, in a modified form, for tricuspid replacement in Ebstein's anomaly. Based on the same principle (a ball-type valve without a cage) a prosthetic aortic valve was later developed and has been used during the past 1½ years for the correction of all acquired aortic valvular lesions.

The subsequent modification of the mitral prosthesis—to reduce the incidence of small embolic phenomena encountered in a number of mitral replacement cases and to make the valve more effective at rapid heart rates—was also described.

An analysis of the experience with these valves was reported; the mitral, aortic, tricuspid and multivalve replacement series being described independently.

All patients were severely disabled. Progressive deterioration in function and failure to respond to medical treatment were the indications for valve replacement. The techniques used were described. Immediate and late deaths and their causes, and the incidence of postoperative complications were discussed. Postoperative follow-up studies were presented.

The U.C.T. prostheses can be inserted with low operative risk. They function adequately once inserted and continue to function satisfactorily for long periods.

THE USE OF PROSTHETIC VALVES IN THE SUB-CORONARY POSITION

DENIS FULLER, PAUL MARCHAND, ERNST JOUBERT AND LOUIS DU PLESSIS

A review of the total experiences in Johannesburg of sub-coronary aortic valve prosthesis in 24 cases. This is the com-

bined experience of surgeons working in the Johannesburg General and Baragwanath Hospitals.

Twenty-four aortic valve replacements have been done using Muller valve for 3 and the Star Edwards valve in the remainder.

There have been 5 hospital deaths and 2 late deaths, one from the effects of bacterial endocarditis and the other, a

syphilitic, who died 4 months later. Two of the hospital deaths occurred in patients in whom aortic and mitral valves were replaced. All the remainder are well.

There was a review on the current literature on aortic valve surgery.

A REVIEW OF SURGICAL TECHNIQUES USED IN JOHANNESBURG FOR MITRAL VALVE SURGERY

L. DU PLESSIS, P. MARCHAND, D. FULLER AND E. JOUBERT

Forty-eight patients with dominant mitral regurgitation who were operated upon under cardiopulmonary bypass before May 1962, were reviewed. By correlating the pathological anatomy of the diseased valve, the surgical procedure and the operative result it became evident that only 1 of 4 surgical procedures were corrective. It was concluded from this review that the nature of the surgery had to be tailored to the pathological anatomy of every valve as assessed at operation.

Since May 1962 these surgical principles have been adopted in a further 54 patients with mitral regurgitation. An analysis

of these patients was again made and on the basis of the surgical procedure performed, were presented as 3 different groups: (1) reconstruction of the mitral valve by the use of pericardial inlay grafts, (2) total replacement with the Starr Edwards mitral valve prostheses, (3) annuloplasty and reconstruction of the chordae tendineae.

The advantages and disadvantages of each of these methods were discussed, as well as the pre- and postoperative haemodynamic findings in some of these patients.

CONSIDERATIONS IN THE CONSTRUCTION OF A FULLY ANATOMICAL WHOLE MITRAL VALVE FROM AUTOGENOUS TISSUES

J. C. VAN DER SPUY

The technique of manufacturing a whole mitral valve (ring, cusps and chordae tendineae) from autogenous pericardium and ilio-tibial tract at the time of operation was described and

illustrated. The more important anatomical and functioning features of the normal valve, upon which the construction of this prosthetic valve is based, were discussed.

HAEMODYNAMICS FOLLOWING REPLACEMENT OF THE MITRAL VALVE WITH THE U.C.T. LENTICULAR PROSTHESIS

W. BECK, D. FERGUSSON, C. N. BARNARD AND V. SCHRIRE

Postoperative haemodynamic studies were performed in 8 subjects following replacement of the mitral valve. In 5 instances a comparison was made with the pre-operative findings at cardiac catheterization. The great clinical improvement seen in most cases was reflected in the findings of this study which indicate slight residual mitral stenosis without incompetence.

In two subjects severely elevated pulmonary vascular resistance fell markedly following the relief of left atrial hypertension. In 5 postoperative cases the effect of exercise was studied: the increased heart-rate, shortened diastole and

increased cardiac output resulted in an increased gradient across the valve, and an increased pulmonary artery pressure accounted for the continued impairment of exercise tolerance in most cases. In 2 cases the clinical improvement was slight; one of these died 18 months after surgery from severe systemic hypertension, the result of renal artery stenosis.

Poor left ventricular contractility observed on cine-angiography and due to unknown causes appeared to be associated with the less satisfactory results in the other case. Small cerebral emboli occurred in 50% of the cases studied, of which only one has a persistent aphasia.

EXERCISE STANDARDS FOR THE EFFORT ELECTROCARDIOGRAM CAPABLE OF PRODUCING EQUAL STRESS IN SUBJECTS OF VARYING WEIGHT

B. VAN LINGEN, P. D. SEAWARD AND W. A. ODENDAAL

In a study of 81 subjects it was found that at similar work loads the pulse rate was faster in lighter subjects than in heavy subjects, confirming that an equal work load produces unequal stress in subjects of varying weight. However, the pulse rate during exercise showed a linear relationship to the speed of work, indicating that this type of exercise produces an equivalent physiological stress in subjects of varying weight. Both age and sex, which affect the working capacity, will need consideration in the establishment of standards which produce

an equal physiological stress in subjects of varying weight.

It was suggested that the speed of work be used to produce an equivalent physiological stress in subjects of varying weight. The inclusion of dynamic ECG stress tests will require that the test procedure be prolonged for at least 5 minutes to produce a 'steady state'. A two-step device should be replaced by a single step so as to make the recording of the dynamic electrocardiogram easier.

TRANSSEPTAL LEFT HEART CATHETERIZATION: A REVIEW OF 100 CASES PERFORMED BY THE BROCKENBROUGH TECHNIQUE

G. E. GALE AND J. B. BARLOW

Experience with 100 transseptal left heart catheterizations by the Brockenbrough technique was described.

In this study the chief use of this technique was in the accurate assessment of mitral valve disease. It enabled left atrial pressures to be recorded directly and gradients across the mitral valve to be measured. Its use in combination with retrograde aortic catheterization made possible the measurement of aortic valve gradients in severe aortic stenosis. Selective left heart cine-angiography through the Brock-

enbrough catheter was of greatest value in demonstrating ventricular septal defects, in showing the exact site and extent of aortic coarctation and in demonstrating obstructive cardiopathy. Left-sided intracardiac phonocardiography was also performed.

It was concluded that despite the value of the information obtained, this method should be applied with great circumspection in view of its inherent risks.

MIOKARDIOPATIE AS GEVOLG VAN ARGEMONE MEXICANA VERGIFTIGING

A. J. BRINK, C. M. LEWIS EN H. W. WEBER

Kliniese waarnemings is gemaak op 3 pasiënte wat vergiftig is met die saad van *Argemone mexicana* (blou dissel). Die bevindings was hoofsaaklik dié van kongestiewe hartversaking in assosiasie met 'n uitgesproke edeem wat die gevolg kon gewees het van meegaande haarvaatskade en die teenwoordigheid van anemie.

Daar was kliniese en laboratorium bevindings wat op miokardiale aantasting gedui het en hartvergroting en long-

edeem in 2 pasiënte gesien. Kardiale kateterisasie-bevindings en arteriële bloedgasstudies is uitgevoer.

'n Soortgelyke beeld kon in 3 honde aangebring word deur die gebruik van die saad. Die patologiese bevindings in die organe van die honde en veral die miokardium is nagegaan. Die histologiese bevindings in die harte van die honde is nie soortgelyk aan dié van die verskillende tipes menslike miokardiopatieë nie.

LONGDIFFUSIE BY PASIËNTE MET INTRAKARDIALE SEPTALE DEFEKTE

A. J. BRINK EN C. M. LEWIS

Koolstofmonoksied diffusie oor die alveolêre-kapillêre membraan is bepaal in 'n reeks van 17 normale mense tussen die ouderdomme van 17 en 45 jaar, asook in 16 pasiënte met intrakardiale septale defekte. Gebruik is gemaak van die vereenvoudigde Milledge-tegniek waarvolgens 'n pallado-sulfiet indikator die CO-konsentrasie aangedui het voor en na 'vaste stand' inaseming van 0.01% koolgas. Waardes vir CO-persentasie opname by pasiënte met intrakardiale septale defekte was gemiddeld 22.3% hoër as dié by normale mense. Dié verskil was hoogs betekenisvol ($P < 0.0005$). Na aanleiding hiervan (en die moontlikheid dat 'n groter beskikbare pulmonêre oppervlakte met verhoogde pulmonale bloedvloei in die afwesigheid

van aansienlike pulmonale hipertensie gepaard gaan) is pogings aangewend om 'n korrelasie te bevestig tussen CO%-opname, onderskeidelik, pulmonale vloeï-indeks, % links-na-regs aftakking, en pulmonale arteriële weerstand. Ook is die CO%-opname vergelyk met röntgenologiese indrukke van pulmonale bloedvloei in die betrokke pasiënte. 'n Reeks röntgenogramme van pasiënte sonder aantoonbare kardio-pulmonêre aantasting is ook voorgelê vir beoordeling as kontrole vir die gevalle waar 'plethora' te verwagte was. Die waarde van bepaling van longdiffusie as 'n siftingstoets in gevalle van verdagte septale defekte word bespreek.

SYSTOLIC CLICKS AND MULTIPLE VENTRICULAR EXTRASYSTOLES IN A MOTHER AND SON

W. F. SCOTT

A woman aged 62 years was presented who has a systolic click and has been known, for many years, to have runs of ventricular extrasystoles following exercise. Her son aged 22 years was also presented. He has two systolic clicks. Since his earliest years he can remember his pulse becoming irregular

after effort. The ECG taken after effort showed that the irregularity was due to multiple ventricular extrasystoles. His brother was also discussed since he has a soft systolic murmur and a widely split second sound.

ANEURYSMAL DILATATION OF THE MITRAL VALVE CUSPS

JOHN B. BARLOW, C. K. BOSMAN AND W. A. POCOCK

Evidence had previously been produced to show that apical late systolic murmurs are caused by mitral regurgitation and that mid-late (i.e. non-ejection) systolic clicks result from a fibrosed or lengthened chorda tendinea of the mitral valve. The common association of a late systolic murmur and a mid-late systolic click has long been well recognized.

We have encountered patients with these auscultatory find-

ings, abnormal electrocardiograms and angiocardiographic appearances of massive dilatation of the mitral valve cusps. It is possible that this previously unrecognized 'syndrome' sometimes has a hereditary factor. It is also possible that the prognosis is not always good and that sudden death may occur.

Preliminary data on this unusual 'syndrome' was presented.

CALCIFICATION OF THE MITRAL VALVE

F. A. MEINTJIES

The significance of calcification of the mitral valve as recorded in recent literature was noted, and the pathological changes described.

Of 225 cases in which mitral valve surgery was performed at Pretoria during the past 5½ years, calcification was found in 37 (16½%) with a slight preponderance in males. With reference to heavy calcification there is an appreciably higher

incidence in males, and when it does occur in females it appears in the higher age group (average 53 years).

The clinical picture was assessed, and the procedures performed were mentioned, noting the immediate results, and considering the necessity or otherwise for open-heart surgery in this connection.

THE CLINICAL AND DIAGNOSTIC FEATURES OF CALCIFICATION OF THE MITRAL VALVE ANNULUS

F. ZIADY

The clinical features of 5 cases of calcified mitral annulus were described. All were females, 70 years of age or older.

Cardiac complaints of some severity were present in 3 of the 5. All had apical systolic murmurs; 3 of them also had the murmur of aortic stenosis. The use of amyl nitrite showed

interesting changes of fundamental physiological significance in the murmurs. The clinical, electrocardiographic and radiologic features were described.

A cine film demonstrated the radiological features observed in 2 of the cases.

GIANT T-WAVE INVERSION, WITH PARTICULAR REFERENCE TO ITS OCCURRENCE AFTER STOKES-ADAMS ATTACKS

D. JACOBSON AND V. SCHRIRE

This paper drew attention to a definite electrocardiographic syndrome of massive T- and U-wave inversion with long QT interval associated with Stokes-Adams attacks in complete heart block. Only a small number of cases (13) have been reported and in most of these the specific nature of the changes had not been recognized. The paucity of reports relates not only to its rarity but also to lack of recognition of the syn-

drome in the English and American literature.

Five new cases, all females, were described. A further 9 instances of giant T-wave inversion were presented in an attempt to elucidate the pathogenesis of the post-Stokes-Adams ECG pattern. This was discussed and it was suggested that the changes may be cerebral rather than ischaemic in origin.

METABOLIESE WAARNEMINGS BY MIOKARDIOPATIE

A. J. BRINK EN C. M. LEWIS

Miokardiopatie met endokardiale verdikking, trombusvorming en miokardiale fibrose word ook in ons inrigting waargeneem. Die patologie tas veral die linker ventrikulêre apeks aan en ook die regter ventrikulêre apeks. 'n Reeks van 20 bewysde outopsiegevalle het bevestig dat 17 uit die 20 van dié tipe is wat deur Becker beskrywe is en 3 het die patologiese kenmerke van dié tipe wat deur Löffler beskrywe is met 'n

eosinofiliese infiltraat in die miokardium. Studies i.v.m. koronêre bloedvloei deur die N₂O-metode is op sommige van die pasiënte uitgevoer en beperkte waarnemings is tot dusver gemaak t.o.v. die opneem van suurstof en die verbruik van glukose, piruvate en laktate. Geen bepaalde gevolgtrekkings kon as nog gemaak word nie omrede van die beperkte gevalle en omrede van probleme met bestaande tegnieke.

METABOLIESE WAARNEMINGS BY HAMSTERS MET ERFLIKE HARTSIEKTE

L. M. OPIE, A. J. BRINK EN A. LOCHNER

Die spiermetabolisme by 'n ras goue-bors Siriese hamsters wat spier- en miokardiale nekrose spontaan ontwikkel, is bestudeer. Die volgende voorlopige waarnemings is genoem:

1. Snitte wat voorberei is van perifere spier en diafragma het geen verandering in metabolisme van piruvate of palmitaat getoon nie. Ook is daar geen verandering in suurstofopname wanneer dit met kontrole hamsters vergelyk word nie. Die volgende abnormaliteite is egter in die hartspier waargeneem:

1. In die geperfuseerde hamsterharte is die spoed van

glukose en van palmitaat skynbaar vermeerder en die suurstofopname in die geheel is ook vermeerder.

2. Histochemiese studies het aangedui dat miokardiale suksiniese dehidrogenase aktiwiteit vermeerder was in vergelyking met kontrole hamsters. D.P.N. diaforase aktiwiteit was verminder in vergelyking met die kontrole waardes.

Op grond van hierdie bevindings lyk dit waarskynlik dat daar 'n biochemiese letsel in die hartspier van hierdie hamsters is en verdere studies word nog uitgevoer.

METABOLIESE STUDIES OP ROTHART-SNITTE MET VERWYSING NA pH-VERANDERINGE

M. A. MULLER EN L. H. OPIE

Verskillende buffers (tris, Krebs III bikarbonaat en fosfaat), substrate (glukose en piruvate) en veranderinge in pH (6.8-8.0) van die inkuberende media is gebruik om die metabolisme van rothart-snitte te bestudeer. Hierdie metode is gebruik ten einde enige uitwerkings van pH op die meganiese funksie van die hart uit te skakel. Respirasie, substraat-opname en metaboliet-produksie is gemeet en die volgende resultate is verkry:

Met beide piruvate 5 mM of glukose 10 mM as substraat en tris as buffer is 'n stimulasie van respirasie by lae pH-waardes (6.8) en 'n onderdrukking by hoë pH-waardes (8.0)

waargeneem. Met piruvate is die piruvaatopname, laktaat en ¹⁴CO₂-produksie vermeerder met 'n styging in pH. Met glukose is die ¹⁴CO₂-produksie verminder met 'n styging in pH maar piruvaat- en laktaat-produksie styg.

Met gebruik van Krebs III bikarbonaat-buffer en piruvaat as substraat word rofweg dieselfde spoed van respirasie as met tris gemeet, met 'n minder merkbare onderdrukking aan die alkaliese kant.

In 'n fosfaat-buffer word 'n ietwat hoër spoed van respirasie waargeneem, maar dit bly konstant oor die pH bestek van 6.8 tot 7.6.

METABOLIESE VERANDERINGE BY DIE ROTHART AS GEVOLG VAN TEMPERATUUR-WISSELING

F. BURGER, L. H. OPIE EN A. LOCHNER

Ernstige biochemiese veranderinge vind plaas in geïsoleerde hartweefsel wat blootgestel word aan hoë temperature (41-46°C) vir 'n tydperk van 1 uur.

Gedurende perfusering van die rothart verminder die miokardiale inhoud van adenosien trifosfaat progressief en die vorming van kreatien, ammonia en melksuur dehidrogenase vermeerder soos die temperatuur van die perfusaat styg vanaf 35 tot 44°C.

Glukose metabolisme van die geperfuseerde hart was bestudeer by temperature van 35 tot 42.5°C. By die hoogste

temperatuurwaardes is die verhoogde glukose opname verklaarbaar deur 'n gelyke verhoging in laktaatforming maar glukose-oksidasie is onveranderd; die glikogeensintese wat gevind word by laer temperature verander tot glikogenolise. Palmitaat oksidasie styg by 41°C in vergelyking met 35 en 39°C maar die titreerbare opname is onveranderd.

By rothart ventrikulêre snitte styg ammonia-produksie by 44°C. Miokardiale suurstof-opname was verhoog by 44°C maar merkbaar onderdruk by 46°C.

CLINICAL EXPERIENCE WITH ELECTRICAL PACING OF THE HEART

M. ZION, I. W. P. OBEL, P. MARCHAND, D. FULLER AND J. B. BARLOW

Details were presented of the authors' total experience of internal electrical pacing of the heart in heartblock. The use of the catheter electrode and of intramyocardial electrodes

with their implanted or external units, was described.

Complications and difficulties were described. A follow-up of over one year in the earlier cases was presented.

It was concluded that electrical pacing constitutes a great advance in the management of heartblock, and that many lives can now be saved which would previously have been

lost. While electrical pacing is an established therapeutic procedure, further research is necessary to improve on methods of pacing.

CLINICAL AND EXPERIMENTAL EXPERIENCES WITH ELECTRICAL PACEMAKING OF THE HEART

P. MARCHAND, C. JAROS, I. OBEL AND M. ROGERS

Our experience with the treatment of 12 patients with total heartblock were analysed. Most of these were treated by more than one technique of artificial pacing of the heart. The techniques used were: (1) temporary pacing through a bipolar right ventricular electrode introduced through the external jugular vein, (2) permanent pacemaking with the unipolar electrode in this position, (3) implanted pacemakers, and (4) surface-implanted electrodes with an external pacing unit.

The difficulties and complications of each of these methods of pacing the heart were analysed and as a result of this experience a concept of an ideal pacemaker has been developed.

In the experimental laboratories the problem of pacemakers has been tackled from basic principles and an attempt was made to study the function of the healthy and damaged conduction systems within the heart.

THE USE OF INTRACARDIAC ELECTRODE CATHETERS IN THE SHORT-TERM MANAGEMENT OF NON-SURGICAL HEARTBLOCK

A. SWANEPOEL, W. BECK, D. JACOBSON AND V. SCHRIRE

The need for an effective and simple method of temporarily pacing the heart was outlined. Techniques of internal electrode catheter insertion and operation were defined. Indications were

discussed with reference to experience at Groote Schuur Hospital.

STOORNISSE VAN VET- EN KOOLHIDRAAT-METABOLISME AS MOONTLIKE OORSAAK VAN ISGEMIESE HARTSIEKTE

WILLIAM H. DAVIS

Twee groepe is onderskei: (i) 'n hiperglukemiese of sg. vertraagde suikerkurwe-groep, en (ii) 'n hipoglukemiese groep waar dit moontlik is dat koolhidraat swak geabsorbeer word en

vette dan metaboliseer word om energie te verskaf. Die waarde van dieetkundigeterapie is bespreek.

AUSCULTATORY AND PHONOCARDIOGRAPHIC DIAGNOSIS OF VENTRICULAR SEPTAL DEFECT WITH AND WITHOUT PULMONARY STENOSIS

L. VOGELPOEL, V. SCHRIRE, W. BECK AND M. NELLEN

This study attempted to correlate the phonocardiographic and haemodynamic findings in 200 patients with ventricular septal defect (VSD). In 40 there was associated pulmonary-outflow tract obstruction.

Subjects with isolated VSD were grouped according to the pulmonary arterial pressure and the size of the left-to-right shunt. In type I, the pulmonary systolic pressure was virtually normal, being less than 40% of the systemic systolic pressure. In type II there was moderate pulmonary hypertension, the pulmonary systolic pressure ranging from 40-80% of the systemic systolic. In type III there was severe pulmonary hypertension, the pulmonary systolic exceeding 80% of the systemic systolic pressure. Type I was subdivided into type Ia—minute VSD with shunt less than 10%, type Ib with shunt less than 40% and type Ic with shunt greater than 40%. Type III was subdivided into: type IIIa with shunt greater than 40% and type IIIb with a bidirectional or dominant right-to-left shunt.

The PCG findings showed a wide spectrum correlating well with the haemodynamic changes. Criteria were defined which should enable a valuable contribution to the diagnosis and prognosis to be made from the PCG alone. These were discussed.

Subjects with combined VSD and pulmonary-outflow tract obstruction (PS), whether valvar or infundibular, were analysed separately because the presence of PS greatly modified

the auscultatory signs. As in isolated VSD a wide spectrum of syndromes existed. The patients were grouped according to the degree of left-to-right shunt and the right ventricular systolic pressure.

In type I (small VSD with mild PS) the shunt was less than 40% and the RV systolic pressure less than 50 mm.Hg. In type II (moderate VSD with mild PS) the shunt exceeded 40% and RV systolic pressure ranged from 50-80 mm.Hg. In type III the RV systolic pressure ranged from 80 mm.Hg to equal the systemic systolic pressure. This was further subdivided into type IIIa (large VSD with moderately severe PS), wherein the shunt exceeded 40%; type IIIb (large VSD with severe PS)—acyanotic Fallot's tetralogy—with shunt less than 40%; type IIIc (large VSD with very severe PS)—classical Fallot's tetralogy (analysed elsewhere). In type IV severe PS was associated with small VSD.

The PCG findings were rather similar in each group where a left-to-right shunt existed. Accurate haemodynamic diagnosis from the PCG alone was therefore much less easy than in isolated VSD. However, using the criteria to be described, combined with the response to vasoactive drugs and the data from clinical examination, ECG and X-ray appearances, it should be possible to reach a reasonably accurate bedside diagnosis.

The value of the PCG in diagnosing associated conditions and in long-term follow-up were discussed.

HARTSIEKTE BY 'N BESONDERE FAMILIE

J. M. COMBRINK EN P. J. KLOPPERS

Vyf geslagte van 'n familie is beskryf waarvan verskeie lede oorlede is na oefening of opgewondenheid. Sinkopie-aanvalle kom algemeen voor. Kliniese ondersoek van hierdie persone

het merkwaardig min afwykings. 'n Konstante abnormaliteit is 'n verlengde QT-tyd.

THE TESTING OF PHYSICAL WORK CAPACITY IN DISABLED SUBJECTS

P. D. SEAWARD, W. A. ODENDAAL AND B. VAN LINGEN

It has been demonstrated that when subjects of varying weight are exercised at similar work loads lighter subjects work closer to their maximal pulse rate or oxygen uptake than do heavier subjects. In order to produce an equivalent physiological stress in subjects of varying weight it is incorrect to use a similar work load. However, the speed of work has shown a linear relationship to the pulse rate during exercise and it is suggested that a similar speed of work produces an equivalent physiological stress in subjects of varying weight.

In order to assess the pulse rate during exercise it is necessary to relate this to the speed of work. Heavier subjects, as compared with lighter subjects, of necessity will have a

higher ventilation and oxygen uptake doing work at a similar speed. Under these circumstances ventilation and oxygen uptake are best related to both the speed of work and the subject's weight, or their work load. Oxygen uptake and ventilation during exercise can be profitably related to each other with reference to the speed of work or the weight of the subject. This arises from the fact that oxygen uptake is a measure of the stress of the exercise and both oxygen uptake and ventilation are related to the weight of the subject.

The utilization of these concepts were demonstrated by the use of clinical data.

THE BIOCHEMICAL EFFECTS OF DEXTROSE AND WATER PRIMING OF THE PUMP FOR OPEN-HEART SURGERY

I. W. P. OBEL, P. MARCHAND AND L. DU PLESSIS

More than 25 patients with various diagnoses were subjected to open-heart surgery on cardiopulmonary bypass. Degrees of haemodilution of the priming blood with 5% dextrose water were used and the patients were studied biochemically. Acidosis and electrolyte changes followed. The level of serum potassium in particular, fell—largely through urinary loss. This resulted in a number of clinical syndromes. Metabolic acidosis was a

consequence of dextrose water haemodilution and this was largely due to the pH of dextrose water being low. All the patients studied had been off diuretics for at least 7 days before operation and had been given potassium by mouth pre-operatively. From the experience and results obtained, we decided to modify our priming fluid.

FACTORS INFLUENCING ACID-BASE BALANCE DURING CARDIOPULMONARY PROCEDURES

K. B. VETTEN AND P. GOOSEN

An account of early experiences in this field was given. The importance of pre-operative tranquillizers and premedication was stressed. The induction and maintenance of anaesthesia was discussed. During the period of bypass such factors as duration of the bypass, freshness of the blood, diluents (sodium bicarbonate), hypothermia, and helium are important.

A possible explanation was suggested in relation to Kreb's cycle, this being an incomplete metabolism of excess dextrose.

The necessity of hyperventilation and intermittent hyperinflation following bypass, and the necessity of tracheostomy under certain conditions, were stressed.

FUNCTIONAL ANATOMY OF THE BASE OF THE HEART

J. C. VAN DER SPUY

The functional anatomy of the base of the right ventricle, base of the left ventricle, right ventricular outflow tract, left ventricular outflow tract, tricuspid ring, mitral ring, membranous

part of the interventricular septum, as also the function of the mitral valve and the functions of the tricuspid valve were discussed.

RAPID DIGITALIZATION WITH ACYLANID

D. KRIKLER

It was felt that there might be considerable practical benefit if single-dose oral digitalization could be shown to be safe and effective. Two separate trials were conducted under different circumstances. At the Baragwanath Hospital, Johannesburg, 25 African patients were treated by Dr. L. Schamroth; the majority suffered from rheumatic heart disease. In a series

of 50 White patients seen in consultant private practice in Salisbury, ischaemic heart disease was the commonest cause of cardiac failure. The results in both groups showed that acetyl-digitoxin (Acylanid), given in a single dose averaging 2.0 mg. is a safe, simple, rapid, effective and convenient method of digitalization.

AMOEBIC PERICARDITIS

ERNST JOUBERT

A review of the literature of amoebic pericarditis was given. One case treated surgically was described in detail. A plea

was made for this new surgical approach.

LONGSTRUKTUUR EN -FUNKSIE

M. A. DE KOCK

Die longe bestaan uit relatiewe delikate weefsel en gedurende lewe is daar 'n balans tussen die vloei en distribusie van bloed. Die ondersoek van gekollabeerde longweefsel waardeur geen bloed of lug beweeg nie, is onrealisties as die verband tussen longstruktuur en longfunksie bestudeer wil word. Die tegniek om longweefsels vinnig te vries deur middel van propaan en

Ns, soos beskryf deur Staub en Storey, maak dit moontlik om die onderlinge verwantskap tussen funksie en longstruktuur onder verskillende toestande na te gaan. Snitte en vars gevriesde longe is getoon om verskillende aspekte van funksionele anatomie in die normale long en in patologiese toestande te demonstreer.

DIE REGTER PREKORDIALE ELEKTROKARDIOGRAM BY REGTER VENTRIKULÊRE HIPERTENSIE

G. P. HUMAN

Ondersoek van die regter prekordiale kardiogram en tydsverhoudings hiervan met die intrakavitêre EKG in 80 gevalle van regter ventrikulêre hipertensie dui op die wesenlike ooreenkoms van rsR' en qR-komplekse as synde verteenwoordigend van

hipertrofie van die crista supraventricularis; die groot R-golf in die regter prekordiale kardiogram word veroorsaak deur depolarisasie van die verdikte vry wand van die regter ventrikel.

OEFENINGSTUDIES BY PASIËNTE MET MITRAALKLEPLETSELS

C. M. LEWIS

'n Reeks pasiënte met mitraalklepletsels is bestudeer uit die oogpunt van die hemodinamiese en metaboliese respons tot fisiese werkverrigting. Gebruik is gemaak van standaard hart-kateterisasie tegnieke tesame met trapmeul spiro-ergometrie om verskeie parameters onder rustende omstandighede te bepaal asook by werksbeladings wat gestel is volgens die pasiënt se funksionele vermoë. Die meeste pasiënte was in staat om stapoefening uit te voer teen 'n spoed van 33—50 m./sek. en 'n helling tussen 0 en 6 grade. Pulmonale, sistemiese en pulmonale, kapillêre wigdrukke is voor en tydens oefening bepaal.

asook die kardiaal uitwerping, hartslagvolume, arteriële weerstand, ens. Arteriële bloedmonsters en ook hepatiese veneuse monsters is versamel vir bloedgasstudies, pH-bepalings, hematokrit lesings en analise vir inhoud van verskeie koolhidraat substrate en vry-vetsure. Die voordele van trapmeulwerkverrigting en die vertikale liggaamshouding in die bepaling van funksionele vermoë asook die besondere probleme verwant aan bogemelde tegnieke en verskeie verskynsels en bevindings wat uit die kliniese toepassing daarvan voortvloei, is bespreek en geëvalueer.

EKSPERIMENTELE ISOLERING VAN BRONGIALE ARTERIES SONDER TORAKOTOMIE

M. A. DE KOCK

Die brongiale arteries voorsien die brongiale boom tot by die terminale brongioli wat anatomies en embriologies afsonderlik van die alveolêre deel van die long is. Die laasgenoemde deel word deur die pulmonêre arterie voorsien. Die brongiale arteries voorsien ook die intratorakale deel van die vagus senuwees, vasovasorum van die pulmonêre arterie in die aorta, en het dus 'n belangrike invloed op die normale fisiologie van die longe en in patologiese toestande. Die isolasie van die brongiale arteries vir eksperimentele doeleindes is tegnies

baie moeilik en verg uitgebreide chirurgie as gevolg van die groot variasie van hul anatomie. 'n Nuwe metode is ontwerp om die brongiale arteries in honde te isoleer sonder die doen van 'n torakotomie tydens die eksperiment. 'n Metaalbuis met 'n ballon aan elke punt word deur die abdominale aorta in die torakale aorta geplaas. Wanneer die ballonne opgeblaas word, word die segment van die aorta vanwaar die brongiale arteries hul oorsprong het geïsoleer, terwyl die lumen van die buis bloed deurlaat na die abdominale aorta.

URINARY CALCIUM AND RENAL STONE—A REAPPRAISAL

M. MODLIN

More than 90% of renal stones are calcium-containing and the role of calcium in their genesis has occupied the minds of investigators for a considerable time with extraordinarily little success. The relation between urinary calcium and the formation of calcium-containing renal stone was critically re-appraised from several aspects. The daily output of calcium and its role in the genesis of renal stone was considered. The solubility of the stone-forming salts and the factors controlling this were outlined as some degree of crystallization is an

absolute requirement for stone formation. Newer concepts of calcification as applied to renal stone formation were presented. Studies of urinary ionized calcium in relation to renal stone formation were discussed.

Renal stone formation in the Bantu is rare. A comparative study of calcium fractions in the urine of normal White and Bantu subjects was presented and compared with a similar study in patients with renal stone.

THE UPTAKE OF ¹³¹I-LABELLED TRIIODOTHYRONINE BY RED CELLS AND RESIN AS TESTS OF THYROID FUNCTIONRALPH E. BERNSTEIN, *Electrolyte and Metabolic Research Unit, South African Institute for Medical Research, Johannesburg*

The factors involved in measuring the uptake from whole blood of ¹³¹I-triiodothyronine by human red cells were investigated, and compared with a method developed for the resin uptake of this labelled compound from serum. The results for healthy subjects of different age, sex and racial groups were

presented. The problems involved in the use of these *in vitro* tests for the diagnosis of thyroid dysfunction and their advantages were considered.

This study was supported by a grant from the Atomic Energy Board, Republic of South Africa.

SWEAT ELECTROLYTE SECRETION IN HYPERTHYROIDISM

KOPPEL I. FURMAN

The dynamic patterns of heat-induced sweat electrolyte secretion are markedly affected by the physiological state of the thyroid gland. Increased potassium and relatively decreased sodium secretion is noted in the sweat of hyperthyroid patients subjected to heat stress. A similar increase in sweat potassium secretion can be induced in normal (euthyroid) subjects

following oral administration of thyroid hormones; however, the effect on sweat sodium in these instances is variable depending on the subjects' state of heat-acclimatization.

The hyperthyroid sweat electrolyte patterns observed were compared to those occurring in normal heat-acclimatized and non-acclimatized subjects.

GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY (DRUG SENSITIVITY OF RED CELLS): INCIDENCE AND CLINICAL IMPLICATIONS IN SOUTH AFRICA

RALPH E. BERNSTEIN, *Electrolyte and Metabolic Research Unit, South African Institute for Medical Research, Johannesburg*

The sex-linked inherited deficiency of red cell glucose-6-phosphate dehydrogenase may lead to an acute, severe, self-limiting haemolytic anaemia on exhibition of many drugs used in medical practice. The incidence of the defect was determined for various South African groups. It is rare in Whites of various racial origins as well as in Coloureds, Indians and Malays. The incidence varied from 2% to 15% in the Bantu, depending on the geographic and tribal source of the groups studied; generally, its occurrence was low in the Transkei and Natal, moderate in the central regions, and higher in the

Transvaal and Portuguese East Africa.

The liability to drug-induced haemolytic anaemia and its mechanism was considered. A haemolytic episode of unknown origin in immigrants from Mediterranean countries of Bantu subjects, whose tribe is known to have a high incidence of glucose-6-phosphate dehydrogenase deficiency, should lead to tests for the exclusion of enzyme-deficient red cells as the basic cause.

The project was partly supported by the CSIR and the US Public Health Service, grant HE-05448.

FAMILIAL DISEASES IN THE SEPHARDIC JEWS OF RHODESIA

D. KRIKLER

There is a large community of Sephardic Jews in Rhodesia whose original home was on the Dodecanese island of Rhodes. Practically all members live in Salisbury, and the community is an inbred one with a high incidence of consanguineous marriages. The patterns of various diseases with a familial incidence was discussed, with special reference to polycystic

disease of the kidneys, diabetes mellitus, and familial Mediterranean fever. The latter condition was also found in a family of Iraq-descended Jews living in Salisbury. No cases of familial Mediterranean fever were found in members of other communities. None of the cases had amyloidosis.

BLOOD ENZYMES OF CLINICAL AND GENETIC INTEREST

RALPH E. BERNSTEIN, *Electrolyte and Metabolic Research Unit, South African Institute for Medical Research, Johannesburg*

Characteristic features of serum enzyme changes in liver and heart disease, myopathies and malignant disease were illustrated. Because of the ubiquitous nature of tissue enzyme and the mechanism of their transfer to the blood, serum enzyme assays often provide no absolute specificity in diagnosis. Nevertheless, useful additional information becomes available to the clinical chemist and the clinician from the interpretation of selected enzyme estimations. Serum iso-enzyme patterns provide some applications for the diagnosis of organ-specific disease.

Enzyme defects in red cells determine the cause of certain inherited haemolytic anaemias and haemoglobin disorders. (glucose-6-phosphate dehydrogenase deficiency, congenital non-spherocytic haemolytic anaemia, congenital methaemoglobinemia, and acatalasaemia will be considered); in addition, enzyme deficiencies in red and white cells and platelets may be used to detect various genetic disorders.

These studies were supported by US Public Health Service grant, HE-05448-03, and the CSIR.

GLOMECTOMY FOR ASTHMA

P. J. KLOPPERS

Removal of the carotid body as a treatment of asthma has been practised in Japan for some time. Lately this procedure has also been undertaken in other parts of the world.

A considerable number of cases have been treated in South Africa and an attempt was made to assess the results of the procedure.

THE ROLE OF LIVER DAMAGE AND MALNUTRITION IN IDIOPATHIC CARDIOMYOPATHY: SERUM B₁₂ AND RED-CELL THIAMINE CONCENTRATIONS IN SUBJECTS AND CONTROLS

K. J. KEELEY

Microbiological assay of serum B₁₂ and red-cell thiamine was performed in cases of idiopathic cardiomyopathy as well as in various control groups

Serum Vitamin B₁₂

Serum vitamin B₁₂ in 69 cases of idiopathic cardiomyopathy in congestive cardiac failure did not differ from those in 63 controls in congestive failure.

Initial high concentrations falling to normal values are believed to reflect a lessening of hepatic venous congestion: this pattern was observed irrespective of the aetiology of the heart failure. It was concluded that there is no significant association of liver disease with cardiomyopathy.

Red-cell Thiamine

The mean red-cell thiamine concentration of the cardiomyopathic group was slightly lower than in cases in congestive heart failure of varied aetiology. This was attributable to a number of cases in which values approached those found in frank beri-beri.

It was concluded that clinically recognized cardiomyopathy is not a single entity but is divisible into a majority of cases having a normal thiamine status and a minority comprising thiamine-deficient cases, which had not been diagnosed as beri-beri heart disease.

THE ULTRASTRUCTURE OF HUMAN MALIGNANT HEPATOMA CELLS

J. J. THERON AND R. C. P. M. MEKEL, *National Nutrition Research Institute, CSIR and Department of Medicine, University of Pretoria*

Electron microscopical studies of malignant hepatoma cells from Bantu patients showed that the nuclei of these cells were enlarged and assumed bizarre shapes. Various intranuclear inclusions were described. The parallel cisternae of the endoplasmic reticulum were dilated and contained finely granular proteinaceous material. These changes progressed and the endoplasmic reticulum was eventually encountered in the form of isolated dilated cisternae or 'lakes'. The mitoch-

ondria of the malignant cells showed striking abnormalities in size, form and in the arrangement of the cristae. Prominent changes were also noted in the cell membranes.

The significance of these findings was discussed and it was suggested that the described structural aberration in the endoplasmic reticulum could be regarded as a distinctive feature of the malignant hepatoma cells.

ALTERATIONS OF ENZYME ACTIVITY IN PRIMARY LIVER CANCER

R. C. P. M. MEKEL AND J. J. THERON, *Department of Medicine, University of Pretoria and National Nutrition Research Institute*

Serum glutamic pyruvic transaminase, alkaline phosphatase, lactic dehydrogenase, isocitric dehydrogenase and choline esterase were estimated in serum of patients with various liver diseases together with the routine liver-function tests. Diagnosis was always confirmed by biopsy. In most cases of malignant hepatomas the values of LDH, isocitric DHG and alkaline

phosphatase were raised especially in cases of poor histological differentiation of the tumour. The value of determination of above-mentioned enzymes for the differential diagnosis from other liver diseases and the course of the hepatomas was discussed.

THE BASIC FACTOR IN THE CAUSATION OF ATHEROSCLEROSIS

PERICLES MENOI, *Senior Physician, Johannesburg Hospital*

Basic and subsidiary factors in the causation of disease were considered in relation to the aetiology of atherosclerosis. Clinical evidence of the hypolipaeamic action of thyroid was presented.

These results are significant because of the aetiological link between hyperlipaemia and atherosclerosis and because we have, as yet, no generally accepted treatment of atherosclerosis. Evidence connecting hyperlipaemia with atherosclerosis was considered under two headings: experimental and clinical. In this evidence the role of thyroid insufficiency looms large and it seems likely that it is an important cause of hyperlipaemia. Clinical evidence strongly supported this view. This suggested an endocrine basis for the hyperlipaemia commonly en-

countered.

The basic principles of endocrine function were briefly considered particularly in relation to homeostasis. This brought us to the crucial question: If it is the function of the thyroid hormone to lower blood lipids, what hormone is responsible for their elevation? The answer is adrenaline: reasons for this conclusion were considered. The role of heredity in the causation of atherosclerosis was then discussed.

From the evidence presented we concluded that it is those who respond to stress in terms of hyperlipaemia who develop atherosclerosis. The basic factor in its development is defined as an inherited disturbance of endocrine balance characterized by thyroid insufficiency in relation to adrenaline excess.

RECENT OBSERVATIONS ON THE SKIN LESIONS IN ERYTHROPOIETIC PROTOPORPHYRIA

G. H. FINDLAY, *Section of Dermatology, University of Pretoria, and Director, Photobiology Research Group, CSIR*

Since the Porphyrin Congress held in Cape Town in September 1963, the writer realized that certain skin signs found in erythropoietic protoporphyria were misinterpreted, or else simply not recognized. The skin picture in this type of porphyria can in fact resemble lipid proteinosis rather closely. Indeed, the writer had no difficulty in proving that at least 3 of his cases of 'atypical lipid proteinosis' which had been seen several years before erythropoietic protoporphyria was

described, could on reinvestigation be shown to have the latter disease. A fourth case was since seen, by which time the diagnosis of erythropoietic protoporphyria was correctly made on the clinical signs alone, and later confirmed by biochemical tests.

The paper is concerned with the clinical, histological and pathogenetic features of the skin changes seen in erythropoietic protoporphyria.

DIE LEUKOSIET-TELLING IN AFRIKA EN SY VERHOUDING TOT HUIDPIGMENTASIE

H. P. WASSERMANN

Leukosiete wat deelneem aan aseptiese velinflammasie in nie-Blankes hanteer melaniene, en dit is voorgestel dat limfosiete melaniene plaaslik in die vel en ook deur die liggaam as geheel mag vervoer.

Toestande soos Addison se siekte, e.a. toestande met hiperpigmentasie toon dikwels absolute of relatiewe limfositose in die perifere bloed. 'n Limfositose en neutropenie is in die bloed van Bantoes gerapporteer sedert 1917 en soortgelyke bevindings is ook gevind in Amerikaanse Negers, Australiese Aborigines en Indiërs, en in hiperpigmenteerde rasse is bewyse van verminderde aktiwiteit van die bynierskors gerapporteer.

Die ongekontroleerde aard van studies het ons genoop om 100 elk normale Blankes, Bantoes en Kleurlinge by seespieël, in 'n area vry van malaria e.a. tropiese siektes te bestudeer. Alle persone was sosio-ekonomies bevoorreg, met normale hemoglobien-gehaltes, en subkliniese wanvoeding is op grond

van besinkingspoed geëlimineer. Verder is alle individue met 'n eosinofiel telling van meer as 400 selle/kub.mm. uitgesluit.

Die Wilcoxon-Mann-Whitney 2-monster rangtoets is gebruik vir die verwerking van statistiese gegewens (dr. N. F. Laubser en G. Rudolph, WNNR, Afd. Statistiek). Die gegewens is aangebied. Alle seleksie ten spyte, behou die Bantoe 'n hoogsbetekenisvolle neutropenie en betekenisvolle limfositose ten opsigte van die Blanke en Kleurlinggroepe.

Die voorkoms van omgekeerde neutrofiel-limfosiet verhouding is gevind by 9% Blankes, 16% Kleurlinge en 54% Bantoes en redes word aangevoer dat die Bantoe leukosietelling t.w.a. bynierkortexhipofunksie is met gevolglike vermeerderde ACTH en MSH sekresie. Laasgenoemde mag verband hou met huidpigmentasie asook met tekens van vermeerde RES funksie in Bantoes. Die verskil in siektepatroon van die Bantoe mag hieraan gewy word.

HALOGENATED PYRIMIDINES AS RADIOSENSITIZERS IN THE TREATMENT OF STOMACH CANCER

G. FALKSON

Some known facts regarding the mechanisms of the action of 5-fluorouracil and ionizing radiation and the ways in which they may act together to the advantage of the patient, were discussed. Data on 180 patients with stomach cancer were presented. The results indicate that a combined treatment of

fluorouracil and radiotherapy is superior to either form of treatment on its own.

It is concluded that although 5-fluorouracil will sensitize normal tissue to irradiation, tumour tissue sensitization is more significant.

THE VALUE OF TRIETHYLENE-IMINO-BENZOQUINONE (TRENIMON) IN THE TREATMENT OF CHRONIC LEUKAEMIAS AND LYMPHOMAS

S. K. SPIES

The results of treatment with a new antineoplastic agent, triethylene-imino-benzoquinone (Trenimon), were described. Clinical studies were limited to tumours of haemopoietic or lymphoreticular origin.

The drug can be used with good effect in chronic myeloid and lymphatic leukaemia, Hodgkins' disease and other lymphomas. Even cases resistant to other cytostatic agents often obtain dramatic remission—a feature in several of the cases

described in this series. Favourable effects on eosinophilic granuloma were also seen, but the other tumours treated responded more variably.

Distinct advantages of this drug are the absence of serious side-effects and the comparative ease of administration—as little as 2-3 capsules per week often being sufficient for maintenance treatment. No alopecia was observed with this drug.

BRONCHOCONSTRICTION: REFLEX AND LOCAL

M. A. DE KOCK

There is evidence of a complex nervous control of the airway size, and stimuli which reflexly constrict the airways have been described. Reflex bronchoconstriction seems to differ from the alveolar duct constriction as caused by histamine or micro-emboli injected into the pulmonary artery. Histamine injected into the bronchial arteries of dogs reflexly constricted airways innervated by vagal efferent fibres and resulted in a decrease in the volume of an isolated tracheal segment and

a marked increase in total lung resistance but only a small decrease in dynamic compliance. Right-sided injection of histamine resulted in a smaller change in total lung resistance, but a more marked decrease in dynamic lung compliance; the effects due to the right-sided injections were not blocked by vagotomy and were probably due to local effects of histamine on smooth muscle of the terminal bronchioles and alveolar ducts.

SOME ASPECTS OF INITIAL PULMONARY FUNCTION TESTS IN GOLD-MINERS

L. D. ERASMUS

A statistical analysis of a battery of pulmonary function tests in 462 gold-miners was presented with particular reference to the effect of altitude on pulmonary-function testing and comparison was drawn with previously published values. Special

mention was made of 2 groups; the first with unusually high normal values and the second with unexpectedly low values. Comments were made on the type of tests likely to be most valuable in large-scale surveys.

EPIDEMIOLOGICAL OBSERVATIONS ON ASBESTOS IN SOUTH AFRICA

G. K. SLUIS-CREMER, *Director, Miners' Medical Bureau*

The association between mesothelioma of the pleura and exposure to blue asbestos in the North-West Cape is now well documented. It is remarkable therefore that this has not been reported to occur in the Northern Transvaal asbestos fields. Mineralogical differences, and differences in intensity of production, the population at risk, and degrees of environmental

pollution, were examined and discussed.

A Pneumoconiosis Research Unit epidemiological survey on the two populations provided data on the prevalence of radiological changes and of asbestos bodies in the sputum in random samples of these populations. The findings will be discussed.

THE APPLICATION OF RADIOISOTOPES IN INTERNAL MEDICINE

C. R. JANSEN

This was a brief survey of the following diagnostic applications of radioisotopes:

Thyroid. ^{131}I -uptake test, PB^{131}I conversion ratio, thyroid scans.

Haematology. Red-cell mass and plasma-volume determinations; red-cell survival estimations; splenic sequestration; GI

blood loss; iron absorption studies; and Schillings test.

Kidneys. Renal function evaluation as studied by renograms; kidney scanning.

Scanning procedures of the brain, liver, heart, lungs and spleen.

INDIVIDUAL VARIATION IN RESPONSE TO VITAMIN D

C. DANCASTER

In 1957, soon after infantile hypercalcaemia became widely recognized, it was suggested that vitamin D might be a causative factor and that a small minority of infants were for some obscure reason abnormally sensitive to the vitamin D which had been added to their food. A wide spectrum of individual response has been suggested previously by Fanconi.

Further evidence is presented in support of this hypothesis. In ordinary vitamin-D deficiency rickets, 1 ml. of ostelin forte (equivalent to 600,000 units) was sufficient to heal 23 out of 28 cases. There were, however, 5 children who for some reason were resistant, and required much larger doses. In 8 others with rickets of equal radiological severity, adequate healing was effected by less than half this amount of vitamin D.

The individual response to sunlight exposure, probably the most important aetiological factor in rickets, also varies. Among 100 rickety children there were 14 who had been exposed to more than 2 hours of sunlight daily. In a control series, 4 children had only 10 minutes exposure to sunlight daily, but had no evidence of rickets.

Variable response to vitamin D is evident in some abnormal metabolic states where both resistance and sensitivity may occur. Resistance occurs in some of the renal tubular defects where one million units daily have been necessary to effect healing. Undue sensitivity to the toxic effects of vitamin D was discussed in sarcoidosis and myeloma, where 200,000 units daily had resulted in hypercalcaemia after only 5 days.

JUVENILE HYPOTHYROIDISM IN IDENTICAL TWINS

S. LOPIS

The simultaneous onset of hypothyroidism in identical twin sisters was described and possible aetiological factors sub-

mitted. Antibody studies by Doniach were presented and hereditary and auto-immune aspects discussed.