

Oxford, for their help and encouragement. I am also grateful to Dr. O. Chance, St. Luke's Hospital, Dublin, and Dr. J. P. O'Riordan, National Blood Transfusion Association of Ireland, for giving me the opportunity to collect blood samples.

REFERENCES

- Biggs, R., Douglas, A. S., and Macfarlane, R. G. (1953). *J. Physiol. (Lond.)*, **122**, 554.
- Brambel, C. E., Corwin, A. H., and Capone, V. A. (1955). *Amer. J. med. Sci.*, **230**, 276.
- Brinkhous, K. M., Smith, H. P., Warner, E. D., and Seegers, W. H. (1939). *Amer. J. Physiol.*, **125**, 683.
- Crafoord, C., and Jorpes, E. (1941). *J. Amer. med. Ass.*, **116**, 2831.
- Ferguson, J. H., and Glazko, A. J. (1941). *Amer. J. Physiol.*, **134**, 47.
- Gormsen, J. (1959). *Brit. J. Haemat.*, **5**, 257.
- Holger-Madsen, T. (1961). *Thrombos. Diathes. haemorrh. (Stuttg.)*, **6**, 125.
- , and Schiøler, M. (1960). *Ibid.*, **4**, 261.
- Howell, W. H., and Holt, E. (1918). *Amer. J. Physiol.*, **47**, 328.
- Klein, P. D., and Seegers, W. H. (1950). *Blood*, **5**, 742.
- Lyttleton, J. W. (1954). *Biochem. J.*, **58**, 15.
- O'Brien, J. R. (1960). *J. clin. Path.*, **13**, 93.
- Poller, L. (1956). *Clin. Sci.*, **15**, 55.
- (1960). *J. clin. Path.*, **13**, 226.
- Quick, A. J. (1938). *Amer. J. Physiol.*, **123**, 712.
- Silverman, S. B. (1948). *Blood*, **3**, 147.
- Waugh, T. R., and Ruddick, D. W. (1944). *Canad. med. Ass. J.*, **51**, 11.
- Ziff, M., and Chargaff, E. (1940). *J. biol. Chem.*, **136**, 689.

The January 1963 Issue

THE JANUARY 1963 ISSUE CONTAINS THE FOLLOWING PAPERS

Recent studies of the urobilin problem c. J. WATSON

The haemolytic activity of an iron carbohydrate complex J. FIELDING with the technical assistance of GILLIAN M. SMITH

Microdetermination of calcium and magnesium in biological materials C. H. BOWDEN and VALERIE J. PATSTON

Antiglobulin sera: comparison between serological tests and immunoelectrophoresis G. C. JENKINS

Simplified quantitative methods for bacteriuria and pyuria JAMES MCGEACHIE and ARTHUR C. KENNEDY

The differentiation of Enterobacteriaceae infecting the urinary tract P. F. MILNER

A comparison of quantitative methods in the investigation of urinary infections R. A. OSBORN and A. J. SMITH

Mima polymorpha infection J. BRODIE and A. HENDERSON

'Hand, foot, and mouth disease' associated with Coxsackie A5 virus T. H. FLEWETT, R. P. WARIN, and SUZANNE K. R. CLARKE

Bronchopulmonary moniliasis in the newborn ALENA LINHARTOVÁ and W. CHUNG

Hepatic and cardiac necrosis in a patient with prostatic carcinoma given ϵ -aminocaproic acid F. NOUR-ELDIN and T. F. DRAISEY

Familial histiocytic reticulosis (familial haemophagocytic reticulosis) VALERIE J. MARRIAN and N. G. SANERKIN

Antibody elution from red blood cells HARRY RUBIN

The Anti-A and anti-B antibody content of pooled plasma J. DARNBOROUGH

The relation of the isoagglutinins in pooled plasma to the haemolytic anaemia of burns E. TOPLEY and J. P. BULL, W. d'A. MAYCOCK, A. E. MOURANT and D. PARKIN

Technical methods

Estimation of plasminogen in biological fluids by agar/fibrinogen gel diffusion R. D. THORNES

A rapid capillary test for out-patient anticoagulant therapy L. POLLER

Modification of an extraction technique for estimation of Evans blue in plasma MICHAEL HOBBSLEY and JOAN THURN

A portable micro-centrifuge G. F. GREEN

Acrylic picture varnish for thin stained films MAIR THOMAS

Obituary (Earl Judson King)

The Association of Clinical Pathologists: 69th Meeting

Book reviews

Ninth International Congress of Haematology

Copies are still available and may be obtained from the PUBLISHING MANAGER,

BRITISH MEDICAL ASSOCIATION, TAVISTOCK SQUARE, W.C.1., price 18s. 6d.

previous therapy, is disturbing and must give rise to doubts about the efficacy of cautery (and biopsy) of the cervix as a treatment for chronic cervicitis. More happily, these findings suggest that there is little, if any, short-term relationship between chronic inflammation of the cervix with its associated epithelial abnormalities and carcinoma of the cervix.

From the practical point of view, a less pessimistic attitude would seem to be justified, at least if the present series of patients can be considered representative. In cases in which there remains considerable doubt about the histological appearances, even after full clinical investigation, a conservative approach seems reasonable and would justify the adoption of less drastic treatment. In young women, repeated cytological examination is all that is required, although simple hysterectomy may be

employed for patients past the menopause or for those who do not desire further children.

I wish to thank the British Empire Cancer Campaign for a research grant, the Council of Europe for a medical fellowship, and Professor A. C. Lendrum for reading the script. I am particularly grateful to Professor James Walker for his constant encouragement and help.

REFERENCES

- Foraker, A. G., and Reagan, J. W. (1956). *Cancer (Philad.)*, 9, 470.
Galvin, G. A., Jones, H. W., and Te Linde, R. W. (1955). *Amer. J. Obstet. Gynec.*, 70, 808.
Koss, L. G., and Durfee, G. R. (1961). *Diagnostic Cytology and its Histopathologic Bases*, Ch. 8. Pitman Medical, London.
McKay, D. G., Terjanian, B., Poschychinda, D., Younge, P. A., and Hertig, A. T. (1959). *Obstet. and Gynec.*, 13, 2.
Norden, J. G. (1961). Personal communication.
Park, W. W. (1956). *Lancet*, 1, 701.
—, and Lees, J. C. (1950). *Arch. Path.*, 49, 73.
Saphir, O., Leventhal, M. L., and Kline, T. S. (1959). *Amer. J. clin. Path.*, 32, 446.

Broadsheets prepared by the Association of Clinical Pathologists

The following broadsheets (new series) are published by the Association of Clinical Pathologists. They may be obtained from Dr. R. B. H. Tierney, Pathological Laboratory, Boutport Street, Barnstaple, N. Devon. The prices include postage, but airmail will be charged extra.

- 3 The Detection of Barbiturates in Blood, Cerebrospinal Fluid, Urine, and Stomach Contents. 1953. L. C. NICKOLLS. 1s.
- 4 The Estimation of Carbon Monoxide in Blood. 1953. D. A. STANLEY. 1s.
- 5 The Identification of Reducing Substances in Urine by Partition Chromatography on Paper. 1953. G. B. MANNING. 1s.
- 6 The Paul-Bunnell Test. 1954. R. H. A. SWAIN. 1s.
- 7 The Papanicolaou Technique for the Detection of Malignant Cells in Sputum. 1955. F. HAMPSON. 1s.
- 13 The Identification of Serotypes of *Escherichia coli* Associated with Infantile Gastro-enteritis. 1956. JOAN TAYLOR. 1s.
- 14 The Determination of Serum Iron and Serum Unsaturated Iron-binding Capacity. 1956. ARTHUR JORDAN. 1s.
- 16 Preservation of Pathological Museum Specimens. 1957. L. W. PROGER. 1s.
- 17 Cultural Diagnosis of Whooping-cough. 1957. B. W. LACEY. 1s.
- 18 The Rose-Waaler Test. 1957. C. L. GREENBURY. 1s.
- 20 Investigation of Porphyrin/Porphyruria. 1958 (reprinted 1962). C. RIMINGTON. 2s.
- 23 The Dried Disc Technique for Bacterial Sensitivity Tests. 1959. R. W. FAIRBROTHER and J. C. SHERRIS. 1s.
- 24 Safe Handling of Radioactive Tissues in the Laboratory and Post-mortem Room. 1959. R. C. CURRAN. 1s.
- 26 The Periodic Acid-Schiff Reaction. 1959. A. G. E. PEARSE. 1s.
- 28 Daily Fatty Acid Excretion. 1960. A. C. FRAZER. 2s.
- 29 The Preparation of Bone for Diagnostic Histology. 1960. D. H. COLLINS. 2s.
- 30 Control of Accuracy in Chemical Pathology. 1961. G. H. GRANT. 4s.
- 31 Investigation of Haemorrhagic States with Special Reference to Defects of Coagulation of the Blood. 1961. E. K. BLACKBURN. 4s.
- 32 Detection of Resistance to Streptomycin, P.A.S., and Isoniazid in Tubercle Bacilli. 1961. R. CRUICKSHANK and S. M. STEWART. 2s.
- 33 The Laboratory Detection of Abnormal Haemoglobins. 1961. H. LEHMANN and J. A. M. AGER. 4s.
- 34 Titration of Antistreptolysin O. 1961. H. GOODER and R. E. O. WILLIAMS. 2s.
- 35 The Estimation of Faecal 'Urobilinogen'. 1961. C. H. GRAY. 2s.
- 36 Quantitative Determination of Porphobilinogen and Porphyrins in Urine and Faeces. 1961. C. RIMINGTON. 3s. 6d.
- 37 The Paper Electrophoresis of Serum and Urinary Proteins. 1961. G. FRANGLIN and N. H. MARTIN. 4s.
- 38 The Augmented Histamine Gastric Function Test. 1961. M. LUBRAN. 2s.
- 39 Investigation of Haemolytic Anaemia. 1961. J. G. SELWYN. 2s.
- 40 Short Term Preservation of Bacterial Cultures. 1962. E. Joan Stokes. 2s.
- 41 Serological Tests for Syphilis. 1962. A. E. WILKINSON. 6s.
- 42 The Determination of Glucose 6-Phosphate Dehydrogenase in Red Cells. 1962. T. A. J. FRANKERD. 2s.
- 43 Mycological Techniques. 1962. R. W. RIDDELL. 3s. 6d.

precipitation of proteins from the serum, neither liberates iron from contaminating haemoglobin, and both have proved reliable in practice. The results by the three methods are shown in Table VI and indicate that the Teepol method is as satisfactory as the other methods. The sera used covered a wide range of iron values.

DISCUSSION

The method described depends on the release of iron from its complex with transferrin. This release is achieved by the combined action of Teepol and ascorbic acid. Teepol alone slowly liberates the iron, as shown by a gradual decrease of optical density at a wavelength of 470 m μ when it is added to serum. The addition of ascorbic acid, with consequent lowering of the pH value, accelerates liberation and the iron is completely released at a pH of 6.3. This is of interest, because without Teepol Schade, Reinhart, and Levy (1949) showed that the iron-transferrin complex is not completely dissociated at a pH of 6.3. Teepol also acts as an anionic detergent and prevents precipitation of plasma proteins.

In the described method the system of blanks is the same as that employed in the serum iron method developed by Beale, Bostrom, and Taylor (1961). Thus, only one blank (the water blank) need be set up regardless of the number of sera to be tested, because each test solution acts as its own 'internal' blank.

The Teepol method can also be used with bathophenanthroline instead of orthophenanthroline. It is not necessary to sulphonate the bathophenanthroline as is usually required, because it is soluble in buffered Teepol solution. The advantage of using bathophenanthroline is that its complex with iron has a more intense colour at equivalent concentrations of iron than the complex with orthophenanthroline. A less sensitive colorimeter can be used for measuring the optical densities, but bathophenanthroline is more expensive than orthophenanthroline.

The Teepol method has also been used for measuring iron in urine chelated with diethyltriaminopenta-acetic acid. It has been found that iron is not released from this chelate solely by lowering the pH value, and Trinder's (1956) method of measuring serum iron cannot be used. The only modification of the Teepol method necessary is that the tube or cuvette containing all reagents is placed for 20 minutes in a water bath at 96° to 98°C. to develop the colour with orthophenanthroline. The contents of the tube are cooled before the optical density is measured.

The Teepol method for measuring serum iron is simpler and more rapid for hospital laboratory use than other methods which have been described. No claims are made that it is more accurate than the methods currently in use, but it is believed that it is reliable for clinical purposes. The importance of treating glassware and other apparatus to remove contaminating iron must be emphasized.

SUMMARY

A rapid method for determining iron in serum is presented. The iron is extracted and measured without pre-

cipitation of the serum proteins, and only three reagents—a detergent (Teepol), ascorbic acid, and orthophenanthroline—are used. The method can be applied to both fresh and frozen sera and the results are not affected by haemolysis. Recovery of added ferric iron is quantitative. The new method has been compared with the methods of Kaldor (1953) and Trinder (1956).

I wish to thank Shell Chemical (Aust.) Pty. Ltd. for supplying the different batches of Teepol for testing.

REFERENCES

- Beale, R. N., Bostrom, J. O., and Taylor, R. F. (1961). *J. clin. Path.*, **14**, 488.
 Kaldor, I. (1953). *Aust. J. exp. Biol. med. Sci.*, **31**, 41.
 Kitzes, G., Elvehjem, C. A., and Schuette, H. A. (1944). *J. biol. Chem.*, **155**, 653.
 Ramsay, W. N. M. (1953). *Biochem. J.*, **53**, 227.
 Schade, A. L., Oyama, J., Reinhart, R. W., and Miller, J. R. (1954). *Proc. Soc. exp. Biol. (N.Y.)*, **87**, 443.
 —, Reinhart, R. W., and Levy, H. (1949). *Arch. Biochem.*, **20**, 170.
 Trinder, P. (1956). *J. clin. Path.*, **9**, 170.
 Webster, D. (1960). *J. clin. Path.*, **13**, 246.

ADDENDUM

The Shell Chemical Company has replaced Teepol 710 with Teepol 610. The difference in these detergents appears to be solely in the concentration of 'active matter' present. Teepol 710 contains 40% 'active matter'; Teepol 610 contains 34%.

If Teepol 610 is used the reagents become:—

Teepol-acetate buffer solution 45.9% solution of Teepol 610 in water. . . .

Orthophenanthroline solution 0.5% solution of orthophenanthroline in a 37.6% solution of Teepol 610 in water.

Relief for tax payers in Britain

INCOME TAX ALLOWANCE ON SUBSCRIPTIONS

The attention of readers is invited to the arrangement with the Inland Revenue authorities for the allowance of subscriptions to this Journal as an expense for Income Tax and Sur-Tax purposes.

The allowance is governed by the provisions of Section 16, Finance Act 1958, but it is necessary to fulfil certain conditions, the chief of which is that the Journal should be recognized as necessary for your professional work or appointment.

In the cases of subscribers in practice who are normally assessed under Schedule D, the subscription paid can be an expense of the practice and can reduce the amount of net taxable income. Subscribers holding salaried appointments and assessed under Schedule E (P.A.Y.E.) can claim the subscription as an expense, the claim being made either by letter to the Inspector of Taxes or by the appropriate entry on the annual 'Return of Income and Claim for Allowances'.

coagulation and its disorders by the chemical isolation of so-called 'pure' clotting factors. A good deal of the argument centres on whether this has been done by Seegers and others who have tried to reproduce this work, and on the validity of the resulting conclusions.

The orthodox 'coagulationist' and routine haematologist will experience great difficulty with Seegers' terminology. He employs a system of nomenclature based on his own knowledge and experience with pure products. He does not readily concede common ground with the accepted international system of coagulation nomenclature or other pseudonyms widely used. He does not identify factor VII with autoprothrombin I because he states that he does not know what factor VII is.

The chapters on antithrombins, clot retraction, and his re-examination of the original cases of several of the recognized coagulation disorders make fascinating reading. The constant variation between the third and first person and the somewhat irrelevant admixture of philosophical quotations from the poets are, however, very distracting in a scientific work of this type. An example of his dogmatism is his rejection of the validity of the two systems of prothrombinase production. On this he writes:—

'In 1955 the concept arose, first in Oxford, that there are two different systems for the generation of prothrombinase in the body. I do not think there can be systems for generation of what does not exist; namely, prothrombinase.'

The statement which often recurs that Marcoumar has no effect on factor IX (autoprothrombin II) is hard to accept.

This is a useful, informative book for those interested in coagulation chemistry but its value to the general reader must be very doubtful.

L. POLLER

ELECTRON MICROSCOPY *British Medical Bulletin*. (Pp. ix + 179-254; 32 plates. 35s.) London: British Council. 1962.

This survey of current knowledge and developments in electron microscopy in relation to medical science is warmly recommended to all pathologists. Inevitably its

appeal will be more directly to academic workers who can discern possibilities of assistance with research problems, but it is equally fascinating to indulge in hypothetical extrapolation of the observations reported and consider where they can and will reach into the realm of diagnostic pathology. E. H. Mercer's account of the cancer cell, M.S.C. Birbeck's study of melanocytes, and the particularly beautiful work of S. J. Holt and R. M. Hicks on enzyme localization all have obvious links with hospital pathology, but it is perhaps unfortunate that the opportunity was not taken to survey the successful studies on human renal biopsies.

Microbiologists are particularly well served by excellent accounts of virus structure (M. A. Epstein), the viruses of tumours and warts (A. F. Howatson), virus structure studied by negative-staining techniques (R. W. Horne and P. Wildy), and bacterial structure (Audrey M. Glauert). These and many other topics cannot fail to provide interest and enlightenment, not only to those with access to electron microscopes but also to all who habitually use more modest instruments.

T. CRAWFORD

CORRECTION

The review of a book entitled 'Ionizing Radiation' and published in the *Journal for September, 1962 (J. clin. Path., 15, 488)* was written by H. E. M. Kay and not by N. G. Trott.

THIRD SYMPOSIUM ON ENZYMES IN CLINICAL CHEMISTRY

A symposium on multiple molecular forms of enzymes and their use in clinical diagnosis will be held at the New Academic Hospital, Ghent, Belgium, on Saturday 27 April 1963. The meeting will begin at 10 a.m. and end at about 6 p.m. Fee (including lunch) 100 Belgian francs (about 15s.). Readers interested in attending this meeting or in making a short communication are asked to write to: R. J. Wieme, Laboratory of the Medical Clinic, University of Ghent, Pasteurdreef 2, Ghent, Belgium.