was ambulant and wore bibs of towelling found he could reduce the number of bibs used from four to one daily. On rigidity the results on the whole were good, and excellent in one case. This was in a post-encephalitic who found he could walk with confidence while taking the tablets. Previously he could only shuffle after a chair. Its effect on tremor was not any better than that achieved by current therapy. One patient who could not read while taking hyoscine was able to read on the new treatment.

Side-effects.—Mental confusion occurred in one case. Recovery was complete when the tablets were discontinued. Two patients showed signs of euphoria during treatment; the feeling of well-being seemed out of proportion to the objective improvement noted. After the main trial, blood counts were performed on four patients, and six tablets of 10870 a day were prescribed for 14 days. Blood counts at the end of the period revealed no significant change in the number of leucocytes. No effects on bowel functions were observed. Dryness of the tongue and lips was noted in one case of paralysis agitans, but the patient felt well and did not complain of this particular symptom. No pupillary changes were seen, and the tablets did not interfere with reading. This was a welcome change in one patient, who normally needs 3/50 gr. (3.9 mg.) of hyoscine daily to control salivation.

Summary

A new parasympatholytic drug—Ciba 10870—has been tried out in 16 cases of Parkinsonism. The preparation relieved some of the most troublesome symptoms in every case, and in some cases produced very good results. Mental confusion occurred in one case and disappeared when the drug was stopped. No blood dyscrasias were observed during the trial.

If further trial confirms that prolonged administration is safe the preparation can be recommended for the relief of symptoms in Parkinsonism.

We are grateful to Drs. V. E. N. Allen, N. H. H. Golledge, A. W. Woolley, and Douglas Henderson for permission to carry out these trials on patients in their hospitals. We are indebted to Mr. P. J. Fowler, chief pharmacist, Southmead Hospital, for a supply of dummy tablets, and to Messrs. Ciba Ltd. for the tablets of No. 10870.

REFERENCE

Gianniotti, G., Gilberti, F., and Spizzirri, S. (1956). *Gazz. med. Ital.*, **115**, 71.

Speaking at the celebration of World Health Day at London University on April 12, the MINISTER OF HEALTH said that from its inception the United Kingdom had played an important part in the World Health Organization. In terms of money, said Mr. Walker-Smith, we were the third largest contributor. But we did not rate our contribution solely or even primarily in terms of money. We had supplied to the World Health Organization many of our experts in the varied fields of preventive and curative medicine, and we had placed at its disposal our facilities for training many hundreds of medical and health workers from all parts of the world. The Minister added that this country's interest had also been marked by the presence almost continuously since 1948 on W.H.O.'s executive board of a member designated by the United Kingdom. The chief medical officer at the Ministry of Health, Sir John Charles, was this year's chairman of the board. The celebration was arranged by the United Kingdom Committee for the World Health Organization and was held under the chairmanship of Professor C. FRASER BROCKINGTON. Other speakers included COUNTESS MOUNTBATTEN and Dr. P. M. KAUL, assistant director-general in charge of W.H.O.'s advisory services. After thanking the people of Britain for their constant support, Dr. Kaul said that W.H.O. was entering its second decade with a creditable record, the confidence of governments, and a store of experience.

OBSERVATIONS ON SOME "FAST" HAEMOGLOBINS: K, J, N, AND "BART'S"

BY

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Haemoglobin K

When we described the observation of haemoglobin K in a family of South Indian stock (Ager and Lehmann, 1957) we based our identification on a comparison kindly carried out by Dr. R. Cabannes of our "fast-moving" haemoglobin with the pigment described by Cabannes and Buhr in 1955. Its original designation had been haemoglobin I, and this was then altered to haemoglobin J (Cabannes, Duzer, Portier, Massonnat, Sendra, and Buhr, 1956). Finally, at the Congress of the International Society of Haematology in 1956 it was decided to name this haemoglobin K (see Lehmann, 1957). It was thought to be the same as Liberia II, discovered independently by Robinson, Zuelzer, Neel, Livingstone, and Miller (1956). There was one discrepancy: haemoglobin K did not separate from haemoglobin A on acid electrophoresis, but Liberia II showed some separation.

We have now compared our haemoglobin K with eight other samples of haemoglobin K kindly sent by Drs. G. M. Edington, G. L. Robinson, and F. Vella respectively and with one sample of Liberia II sent to us by the American workers. There was no difference at alkaline paper and starch electrophoresis (Fig. 1). However, at acid electrophoresis (paper, *p*H 6.5) Liberia II showed some slight separation from haemoglobin A, whereas all the haemoglobin A + K samples moved as one band. All the haemoglobin A + K samples, however, had a smaller proportion of the fast-moving haemoglobin than of haemoglobin A. In Liberia II the proportion was more than 50%. When haemoglobin A was added to the Liberia II sample so that the proportion of the "fast" haemoglobin (which of course in acid electrophoresis would move more slowly than A) became 25% no separation from A occurred at acid electrophoresis. Furthermore, if haemoglobin K was eluted after starch electrophoresis and haemoglobin A was added to it in a proportion of 50% a faint separation of the resulting mixture was seen on paper electrophoresis at *p*H 6.5.

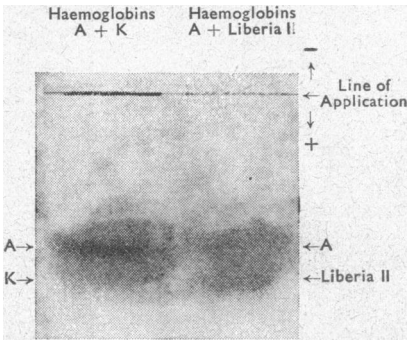


FIG. 1.—Comparison by hanging strip paper electrophoresis at *p*H 8.6 of haemoglobin mixtures A + K and A + Liberia II. The mobilities are the same in both samples.

Thus there is no demonstrable difference between the Liberia II sample and haemoglobin K, and we have at present no reason to assume that the two haemoglobins are different. At a recent conference in Istanbul it was decided to reserve the letter N for Liberia II until this

apparent discrepancy of the electrophoretic behaviour at *p*H 6.5 had been clarified.

Haemoglobin J and Haemoglobin N

We have for some time been concerned with the electrophoretic behaviour at *p*H 8.6 of two blood samples from

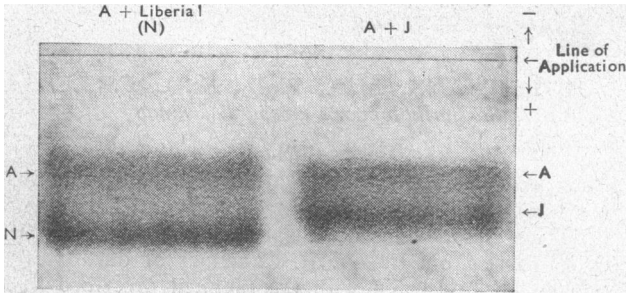


FIG. 2.—Comparison by hanging strip paper electrophoresis at *p*H 8.6 of haemoglobin mixtures A+J and of A+Liberia I (N). Note that Liberia I (N) moves faster than J.

West Africa. One was from an Igalla sent to us by Dr. J. H. Walters from Nigeria, and the other from a Dagomba sent to us by Dr. G. M. Edington from Ghana. These haemoglobins moved faster than haemoglobin K and more slowly than haemoglobin H. We assumed that these two specimens were examples of haemoglobin A+Liberia I or J. Liberia I had been described in West Africa by Robinson *et al.* (1956) as migrating at *p*H 8.6 between K and H or I, and had been thought to have the electrophoretic properties of haemoglobin J. In 1957 several samples of haemoglobin J came into our possession, notably from Colonel Crosby (McCabe, Lange, and Crosby, 1957) and Dr. A. B. Raper (1957), from Dr. L. D. Sanghvi and Mr. P. K. Sukumaran, from Dr. F. Vella, from Dr. Lie-Injo Luan Eng, and from Dr. J. Stijns.

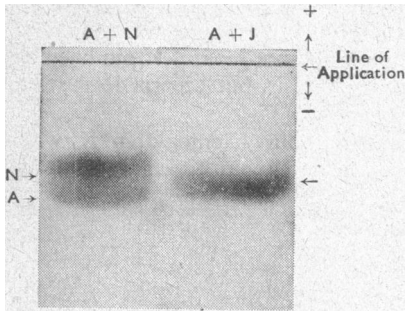


FIG. 3.—Comparison by hanging strip paper electrophoresis at *p*H 6.5 of haemoglobin mixtures A + N and A + J. Note that A + J form a single band, but A and N separate. At acid *p*H the haemoglobins move towards the negative pole, and A is faster than N.

The samples from Colonel Crosby and Dr. Lie-Injo Luan Eng had a higher proportion of J than the others, but all behaved identically and all differed from our two haemoglobin samples. We also obtained a specimen of Liberia I from the American workers, and this showed the properties of our two West African specimens (Figs. 2 and 3). The "fast" component moved at alkaline *p*H faster than J but more slowly than H. At acid *p*H it separated clearly from A towards the anode, which haemoglobin J does not, regardless of whether it is at low proportion or whether it is at the higher proportion seen in the specimens from Colonel Crosby and Dr. Lie-Injo Luan Eng. In the resin chromatogram at *p*H 6 of Huisman and Prins (1955) haemoglobins A and J form a single band but Liberia I and haemoglobin A separate, Liberia I moving between haemoglobins A and F. We communicated our observations to the American authors, who have agreed with us about these differences, and, as Liberia I is unlike all known fast haemoglobins, it has also been agreed that it should be allotted the letter N, which had been originally reserved for Liberia II, if that should have proved to be different from haemoglobin K.

We should like to take the opportunity to stress that identical electrophoretic behaviour is not a final proof of identity (see also Ager, Lehmann, and Vandepitte, 1958). At present we can use only techniques available, and it may well be that, in future, haemoglobins thought to be the same may turn out to be different. We know of at least three examples where haemoglobins have the same electrophoretic properties on paper electrophoresis at *p*H 8.6 and *p*H 6.5 but differ in other respects: S and D (solubility and agar electrophoresis), A_2 and E (amino-acid sequence), L and the "Galveston type" (resin chromatography). Haemoglobins H and I behave identically at *p*H 8.6 but differ at *p*H 6.5.

The following may be another example of such a differentiation.

The Bart's Haemoglobin

We have observed in an infant aged 4 weeks, who was under the care of Dr. A. W. Franklin in the Kenton Ward of St. Bartholomew's (Bart's) Hospital, a haemoglobin which on paper electrophoresis at *p*H 8.6 is virtually identical with Liberia I (or N) (Fig. 4). However, at *p*H 6.5 it moves between N and H. On chromatography at *p*H 6 it is the fastest human haemoglobin so far seen, and moves in advance of haemoglobin H. In some respects it resembles the new "fast" haemoglobin seen by Fessas and Papaspyrou (1957) in a Greek infant. Their haemoglobin was associated with thalassaemia and was not found in either parent. Its concentration fell with that of the foetal haemoglobin, and it had almost disappeared at the age of 4 months, but, unlike haemoglobin F, this haemoglobin was not resistant to denaturation by alkali. In the present instance the investigation of the child's haemoglobin was actually initiated by Mr. A. S. Kyrke-Smith, who noted on a routine investigation for anaemia numerous target cells and suggested that the child should be examined for thalassaemia. In neither parent was found an increase of haemoglobin A_2 or foetal haemoglobin. However, both had a low M.C.H. and a slightly decreased osmotic fragility of their red cells, and although the serum iron level was not high it was within

The Bart's Haemoglobin

	Infant	Father	Mother
Haemoglobin type	40% A 36% F 24% "Bart's"	A	A
Haemoglobin (g./100 ml.)	10·1	14·2	11·8
Red cells (10^6/c.mm.) ..	4·06	5·28	4·85
Packed cell volume (%) ..	32	48	40
M.C.V. (cubic microns) ..	79	91	83
M.C.H. ($\mu\mu$g.)	25	27	25
M.C.H.C. (%)	32	30	30
Reticulocytes (%)	3	1	1
Fragility NaCl (%) ..	0·45–0·15	0·45 0·25	0·45–0·25
Appearance of cells ..	Target cells numerous; anisocytosis; poikilocytosis	Target cells in moderate number	Target cells in moderate number
Serum iron μg./100 ml. ..	55	79	68

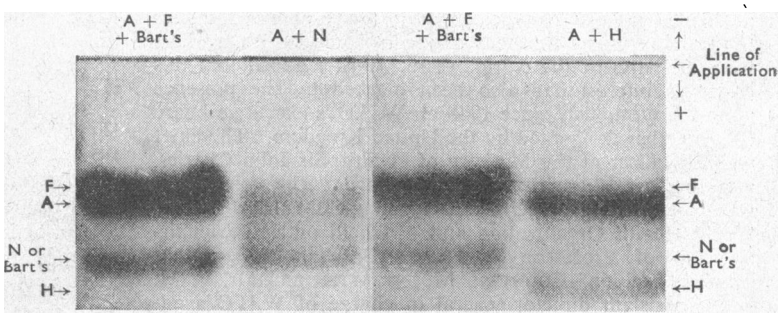
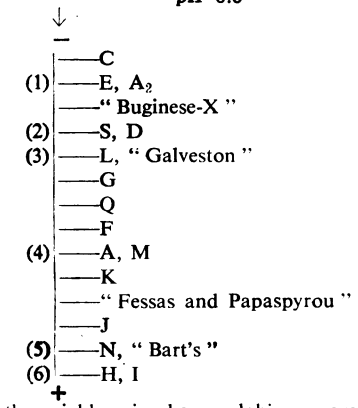


FIG. 4.—Comparison by hanging strip paper electrophoresis at *p*H 8.6 of haemoglobin mixtures A + H, A + F + Bart's, and A + N. Note that N and Bart's have under this condition almost the same mobility and are both migrating rather nearer to H than to A.

normal limits. Everything suggested a true parentage, and the examination of nine blood-group systems kindly carried out by Miss Elizabeth W. Ikin, of the Blood Group Reference Laboratory, fully supported this assumption.

One difference between the Bart's haemoglobin and that of the Greek workers is the mobility on paper electrophoresis at *p*H 8.6, where Fessas and Papaspyrou (1957) indicate the position of their haemoglobin as being faster than K and slower than J, whereas haemoglobin Bart's migrates faster than J and more slowly than H and in fact almost identically with N. Furthermore, when haemoglobin Bart's was isolated by elution after electrophoresis from starch or paper and after chromatography, it was found that in its ultra-violet spectrum the tryptophan fine structure band was of the type up to now thought to be characteristic for haemoglobin F. Dr. G. H. Beaven, of the Medical Research Council Laboratories, Hampstead, kindly confirmed this remarkable observation. Haemoglobin Bart's also resembles haemoglobin F by being resistant to alkali denaturation, though not to the same extent as haemoglobin F. In the standard 1-minute alkali denaturation test of Singer *et al.* (1951) only rather less than half of haemoglobin Bart's becomes denatured. It is already clear that the classical methods for recognizing haemoglobin F—study of alkali denaturation and determination of the ultra-violet spectrum—can be misleading unless the presence of the Bart's haemoglobin has been excluded by electrophoresis or chromatography.

Position of Haemoglobin Variants on Paper Electrophoresis at pH 8.6



Not all the neighbouring haemoglobins separate when mixtures are submitted to paper electrophoresis at *p*H 8.6.

(1) Preliminary experiments indicate difference in amino-acid sequence (personal communication by Dr. V. M. Ingram).

(2) Different solubility of reduced haemoglobin (Itano, 1953); A+S mixtures separate and A+D mixtures do not separate on agar electrophoresis at *p*H 6.2 (Robinson *et al.*, 1957).

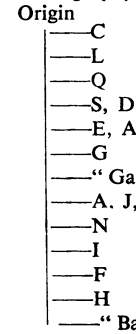
(3) Differences on open boundary electrophoresis (acid) and on resin chromatography (Schneider and Haggard, 1957).

(4) Differences in the spectrum of the methaemoglobin (Hörlein and Weber, 1948); different mobility on starch electrophoresis at *p*H 7.2 (Gerald *et al.*, 1957).

(5) See present paper.

(6) Different mobility on paper electrophoresis at acid *p*H (Rucknagel *et al.*, 1955).

Position of Some Haemoglobin Variants on Resin Chromatography at pH 6



* " Galveston " does not separate from haemoglobin A, the mixture forms a diffuse band.

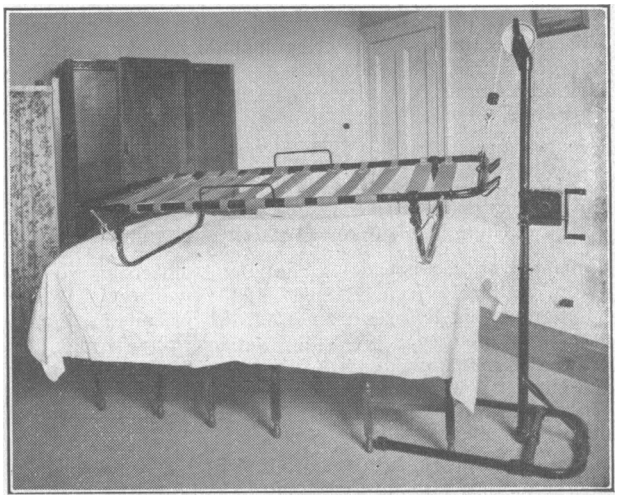
REFERENCES

Ager, J. A. M., and Lehmann, H. (1957). *Brit. med. J.*, **1**, 1449.
—— —— and Vandepitte, J. M. (1958). *Lancet*, **1**, 318.
Cabannes, R., and Buhr, L. (1955). *Pédiatrie*, **10**, 888.
—— Duzer, A., Portier, A., Massonnat, J., Sendra, L., and Buhr, J. L. (1956). *Sang*, **27**, 580.
Fessas, P., and Papaspyrou, A. (1957). *Science*, **126**, 1119.
Gerald, P. S., Cook, C. D., and Diamond, L. K. (1957). Ibid., **126**, 300.
Hörlein, H., and Weber, G. (1948). *Dtsch. med. Wschr.*, **73**, 476.
Huisman, T. H. J., and Prins, H. K. (1955). *J. Lab. clin. Med.*, **46**, 255.
Itano, H. A. (1953). *Arch. Biochem.*, **47**, 148.
Lehmann, H. (1957). *Blood*, **12**, 90.
McCabe, M. E., Lange, R. D., and Crosby, W. H. (1957). *Amer. J. Med.*, **23**, 329.
Raper, A. B. (1957). *Brit. med. J.*, **1**, 1285.
Robinson, A. R., Robson, M., Harrison, A. P., and Zuelzer, W. W. (1957). *J. Lab. clin. Med.*, **50**, 745.
—— Zuelzer, W. W., Neel, J. V., Livingstone, F. B., and Miller, M. J. (1956). *Blood*, **11**, 902.
Rucknagel, D. L., Page, E. B., and Jensen, W. N. (1955). Ibid., **10**, 999.
Schneider, R. G., and Haggard, M. E. (1957). *Nature (Lond.)*, **180**, 1486.
Singer, K., Chernoff, A. I., and Singer, L. (1951). *Blood*, **6**, 429.

Medical Memoranda

The Exeter Nursing-aid

Anyone who has attempted to care for the immobile patient in the home knows of the difficulties both for the sick person and for the attendants. It is to alleviate these burdens that the Exeter nursing-aid has been produced. It embodies many novel features designed to increase the comfort of the patient, and the nursing is made so much easier that the need for skilled attention is either greatly reduced or made entirely unnecessary. Moreover, use of this apparatus makes possible the earlier return from hospital of patients who have been retained solely for nursing



The apparatus.

needs. It also makes possible the postponement or elimination of the need to remove a helpless patient for institutional care. The strain on the nurse or relation is greatly reduced and the distress of the patient considerably relieved.

Many criteria were taken for its production. Although it had to lift a heavy patient safely and smoothly, it still had to be light enough to be easily transportable by a district nurse. It had to be simply assembled and dismantled and to require no maintenance. It had to make lifting the patient so easy that the need for skilled nursing was either reduced or entirely absent. Finally, it had to be cheap.

In an attempt to meet these requirements a unit has been designed having a leg, a sleeve, and two hooks at its end. By joining two completely identical units a stretcher frame is formed with the two halves held together by handles through the sleeves. Bands, each entirely detachable, span the frame and can be passed under the patient when the stretcher is resting on the bed. The sleeves allow for adjustment of the length of frame for different sizes of bed.