In Table II I have included as a failure any recurrence of retinal detachment, however limited and slight, as indeed this was in 4 cases.

The prospect of successful surgical treatment depends much on the type of case. The prognosis is reasonably good in early cases when the retinal tear is relatively small, easily accessible, the ocular tissues are in a good state of health, and an operation by a skilled surgeon is done within a month of the onset of the detachment. It is generally better when the retinal tear is in the lower half of the eye than when in the upper. Successes in early cases are about even in hypermetropes, emmetropes, and low and moderate degrees of myopia.

Large and multiple retinal tears are generally unfavourable, but not always so. One patient with 26 holes in a band of degenerative choroid and retina from 12 to 6 o'clock near the equator on the temporal side recovered after one operation and retained 6/9 vision. Other retinæ with large ragged rents occupying a quadrant of the eye have become reattached after operation and remained so.

The prognosis is slightly worse in deep detachments than in shallow ones on account of the distance of the retinal tear from the choroid. This is met and to some extent effectively dealt with by passing penetrating diathermy needles through the sclera and choroid sufficiently long to reach the retina but not perforate it. Interretinal fluid drains away and the detachment is shallower for subsequent diathermy applications. The prognosis is bad in long-standing cases. The incidence of success falls appreciably three months after the onset of detachment, but reattachment may occur after 4 and even 10 years, particularly when the lower half of the retina only is involved.

Extensive intraocular degeneration affecting the choroid, retina, and vitreous, total retinal detachment, high myopia, very low intraocular pressure and detachment in an aphakic eye, particularly when vitreous has been lost in the course of cataract extraction, and vitreous shrinkage are bad prognostic signs.

Detachment on the nasal side is less serious as regards rapid extension than is the case with detachment originating on the temporal side. In the former the attachment of the retina at the optic disk affords a barrier against sudden involvement of the macula, a complication which may occur within a day or two of a detachment originating in the upper temporal quadrant. When the macula has been stripped off vision is rarely better than 6/24, and is often less than this in spite of successful reposition. Metamorphopsia may also distress the patient for some months after operation when the macula has been involved.

The prognosis is bad in cases of retinal detachment associated with persistent inflammatory lesions of the choroid, sclera, and orbital tissues (orbital cellulitis). Such cases are unfavourable for operation, and if an operation is done through mistaken diagnosis the condition is aggravated and the detachment made worse.

Poor co-operation by the patient after operation and the persistence of marked local reaction with pain are unfavourable prognostic signs. The chances of success are also less favourable in operations which are repeated, although in some cases a fourth operation has resulted in reposition of the retina, the restoration of visual field, and a fair measure of sight.

Although the number of cases due to trauma peculiar to war is small (18 in this series) these few afford an indication of the seriousness of the prognosis and the difficulties which confront the surgeon in planning an operation on an eye which is often severely damaged as a result of either contusion or a penetrating wound, or both. The large splashes of blood on and sometimes beneath the retina which may organize into fibrous tissue bands and ultimately contract, the presence of large rents in the retina through which vitreous gel may have herniated into the interretinal space, and the lowered intraocular pressure are factors which militate against surgical success. In civil practice the counterpart of such cases is found in eyes with degenerative changes in the intraocular membranes and vitreous, commonly as a result of high myopia and senility. As the above statistics show, such cases are, for obvious reasons, rare in military practice.

Summary

This paper reviews 78 cases of retinal detachment occurring in officers and men of the Middle East Force from 1941 to 1943. The cases have been divided into five groups according to the main feature of their pathology. Seventy-six were operated on by the same technique; in one case operation was contraindicated and another underwent spontaneous recovery.

The prognosis is favourable in cases of retinal detachment due to cystic degeneration and to choroido-retinal degeneration, at any rate in young men of military age. It is least favourable in war injuries. The reasons for this are discussed.

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NUTRITIONAL IRON DEFICIENCY ANAEMIA IN WARTIME

PART III: THE HAEMOGLOBIN LEVELS OF SCHOOL- CHILDREN AND PREGNANT WOMEN IN 1944, COMPARED WITH THE LEVELS IN 1942 AND 1943

BY

L. S. P. DAVIDSON, B.A., M.D., F.R.C.P.Ed.&Lond.

G. M. M. DONALDSON, M.B., Ch.B., M.R.C.P.Ed.

S. T. LINDSAY, B.Sc.

AND

M. H. ROSCOE, Ph.D., M.B., Ch.B.

In previous papers (Davidson *et al.*, 1942, 1943, 1944) the haemoglobin levels of various groups of people representative of different sections of the Edinburgh population have been reported. Of these groups the two that showed the highest incidence of anaemia were the municipal primary-school children and the pregnant women. They have therefore been investigated further, the last examination in the summer of 1944 being made two years after the original one. The estimation of the haemoglobin was made with the Haldane haemoglobinometer under standard conditions recommended by the Haemoglobin Survey Committee of the Medical Research Council and using apparatus which had been standardized by the National Physical Laboratory.

School-children (7-13 Years in 1944)

Children from two schools (Schools I and III, Davidson *et al.*, 1944) have now been investigated on five occasions in the past two years. It has not been possible to test all the children each time, but none have been included in the present report who were not tested on the first occasion.

The mean haemoglobin levels found for the two schools on the five dates, together with the number of children tested, are shown in the accompanying Table and also graphically in the Chart.

Table showing Mean Haemoglobin Levels of School-children and Pregnant Women on Various Dates in 1942-4

	1942	1943		1944 June
		June	Dec.	
<i>School I:</i>				
Mean Hb % ..	82.9 (347)	83.1 (149)	87.1 (40)	86.0 (110)
St. Dev. ...	7.2	6.8	4.8	8.8
				6.1
<i>School III:</i>				
Mean Hb % ..	77.5 (96)	81.9 (42)	87.5 (28)	85.8 (56)
St. Dev. ...	4.6	6.7	6.6	8.1
				5.4
<i>Pregnant women:</i>				
Mean Hb % ..	77.0 (64)			86.8 (61)
St. Dev. ...	7.3			7.2

Numbers of children in parenthesis.

It will be seen that there has been a considerable rise in the mean haemoglobin level in the past two years, School I having risen from 82.9% to 87.5%, and School III from 77.5% to 90.8%. Both these increases are statistically significant—that is, more than twice the standard error of the mean. For the greater part of the time there was no significant difference

between the levels of the two schools; but School III, which started lower, was on the final test significantly higher than School I. No explanation for this has been found. It would also appear from the figures that the increases have tended to occur in the spring months (see Chart).

Chart showing mean haemoglobin levels of school-children and pregnant women, 1942-4.

Since the same children have been tested throughout the period their average age has risen by two years, and it might therefore be thought that the rise in the haemoglobin level was due to this. That aspect has been investigated by comparing the mean haemoglobin levels of the children, divided into two-yearly age groups. It was found that the slight increase present with advancing age could not account for the rise in the haemoglobin levels between the first and final readings. No difference between the sexes was observed.

As was reported by Davidson and Donaldson (1944) children from School I were given ferrous sulphate for three months, and those from School III ferrous sulphate and ascorbic acid for six months. The improvement resulting from this treatment was apparent, especially among the younger children, up to a year from the conclusion of medication. The haemoglobin figures for these children were accordingly not included in the mean levels recorded for 1943. By June, 1944, there was no difference between the levels of those who had had treatment and those who had not, so the haemoglobin levels of both groups have been included in calculating the means for the last examination.

Pregnant Women

A comparison has been made between the haemoglobin levels of pregnant women from the same antenatal clinic in 1942 and 1944, grouped according to the trimester of pregnancy and the number of pregnancies. The results show a progressive fall in the haemoglobin level during the course of pregnancy, which was most marked in the case of women who had had three or more pregnancies. In each group the figures for 1944 are approximately 10% higher than those for 1942. Thus it was found (Table; Chart) that in 1942 the mean haemoglobin level of 64 primiparae in the second trimester was 77.0%, while in 1944 61 primiparae, at the same stage of pregnancy, had a mean of 86.8%—an increase of 9.8%.

Discussion

It is thus apparent that both the school-children and the pregnant women have in 1944 a much more satisfactory haemoglobin level than in 1942. This increase in the mean haemoglobin is due to a marked improvement in those who were most anaemic. Thus it was found that a mean increase of 11.7% had occurred in those children whose haemoglobin was less than 80% in 1942, whereas those who had a level of 80% or more showed a mean increase of only 2.6%. Or, put in another way, while in 1942 39.3% of the children had haemoglobins of 80% or less, in 1944 only 12.3% were at or below this level.

It is impossible to be certain of the cause of this improvement. It would appear from the data given in the Report of the Special Joint Committee, set up by the Combined Food

Board, on Food Consumption Levels, 1944, that there has been no material increase in the gross amounts of foodstuffs available for civilian consumption in this country between 1942 and 1943-4. Qualitatively, however, there has been an increase in the calcium, iron, and vitamin B available, the last two owing to the replacement of white flour by national wheatmeal flour. McCance and Widdowson (1940) give figures of 0.66 mg. per oz. for national wheatmeal bread and 0.28 mg. per oz. for white bread. In the course of a study of school-children's diets being made in Edinburgh it has been found, using the above figures for iron in bread, that the calculated daily iron intake of 20 children varied from 14 to 26 mg.—mean 19 mg. If the same amounts of white bread had been eaten instead of wheatmeal the iron intakes would have been from 9 to 21 mg., with a mean of 14 mg.

In Edinburgh during the past two years there have also been an increase in the number of children having school milk and an improvement in the school meals, both of which factors may have raised the protein intake of the children. The children reported on here have been divided into groups according to whether they were having school dinners or not. In Dec. 1943, those with school dinners had improved more than those without; but by June, 1944, there was no difference in the haemoglobin levels of the two groups. The school meals thus do not appear to be an important factor. Again, whereas the school milk may have raised the protein intake of the children, the pregnant women had not received any supplementary rations when the tests were made, on their first visit to the clinic, so there is no reason to believe that their protein intake is better than it was two years ago.

For the above reasons we consider that the increase of iron in the diet has been the chief factor responsible for the raised haemoglobin levels. It is also possible that the increase of calcium and vitamin B has facilitated the absorption of iron—the former by precipitation of the phytin, the latter by improvement of absorption.

Summary

A survey of the haemoglobin of school-children and pregnant women, made in Edinburgh during the past two years, has shown that there has been a progressive rise in the mean haemoglobin levels of these two sections of the population. The cause of this rise is discussed, and evidence is put forward to suggest that the introduction of national wheatmeal flour has been an important contributory factor.

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INDUSTRIAL PROBLEMS IN THE MIDDLE EAST

BY

A. MICHAEL CRITCHLEY, M.D., D.P.H.

Lieut.-Col., R.A.M.C.

AND

I. HARVEY FLACK, M.D.

Captain, R.A.M.C.

During four years of war industrialization has taken place on a scale hitherto unknown in the Middle East. For security reasons details cannot be given, but it may be stated that a large number of R.E., R.A.O.C., and R.E.M.E. workshops and factories have been set up for the manufacture of articles ranging from anti-tank mines to hospital bedsteads. Other large units repair and maintain tanks, guns, vehicles, and instruments. These installations have presented industrial problems varying from those met with in the United Kingdom at the time of the Industrial Revolution to tetra-ethyl-lead (T.E.L.) hazards. All this has taken place in countries with a predominantly agricultural economy and little or no pre-war industry. Many thousands of fellahin who had previously known only the bullock-cart and the ancient plough of biblical pattern have become fitters, welders, blacksmiths, and the like.