The circulation of the upper limbs is maintained through collateral channels, which are presumably very similar to those formed in coarctation of the aorta. Thus pulsating arteries were found over the back in four cases in addition to our own patients. The flow of blood in these anastomotic vessels must, however, be from below upwards, as was noted by both Türk and Bittorf.

The absent pulse in the upper extremities, together with the vigorous pulse and the apparently high blood pressure in the lower limbs which many of these cases exhibit, has led to the application of the unsuitable term "reversed coarctation" to the anomaly by Giffin and by Lampen and Wadulla. A systolic reading of over 200 mm. Hg was obtained in the lower limbs in five cases. With such scanty material, however, it is difficult to be sure how far these pressures exceed the normal. Wendkos and Rossman (1943) carried out a study of the blood-pressure readings in the legs of 500 normal soldiers, excluding all subjects in whom the blood pressure in the arms exceeded 140/90. While the average figure was 154/91, in 25% the systolic pressure ranged from 170 to 195 mm. Hg and in 2% from 200 to 230. They stated that there was a direct relationship between the circumference of the thigh and the height of the blood pressure, and indicated the importance of an increase in the muscle mass in raising the pressure. Nevertheless, the readings given by Lampen and Wadulla are excessive, though the high pulse pressures in these patients were not satisfactorily explained. A reading of 190/110 in Giffin's case certainly seems high for a female aged 19 who is said to have been physically underdeveloped, and a pressure of 240/140 in our first patient, who weighed only 7 st. (44.5 kg.) would also appear to be abnormal. As is to be expected, cardiac hypertrophy was noted in several of the syphilitic cases. It is not mentioned in any of those of non-syphilitic origin, though the weight of the heart in Harbitz's patient was 470 g. No discussion on the possible cause of the raised arterial tension in the lower limbs in these patients would be profitable in the present state of our knowledge of the cause of hypertension in general.

Summary

Two rare cases observed by us in which there was virtually complete absence of the arterial pulse in the upper extremities, head, and neck, owing to arterial occlusion, are described. The cause of the obstruction in these cases was not determined.

Two groups of similar cases collected from the literature are discussed. In the first, occlusion is due to syphilitic aortitis either with or without an aneurysm of the arch. In the second group the aetiology is less clear. Atheroma may be the cause in certain cases, but evidence is produced which suggests that a form of arteritis is more often responsible. The high proportion of women below the age of 40 in the non-syphilitic group renders it unlikely that thromboangiitis obliterans is the cause.

The remarkably constant symptomatology common to both groups is described, the chief symptoms being cerebral and visual. Amongst the former, repeated faintness and syncope are common, while gross cerebral damage as evidenced by convulsions, hemiplegia, or death from cerebral softening may occur. Ophthalmological symptoms include repeated blurring of vision, progressive deterioration of vision, and cataract formation.

The course of the circulation, with special reference to the production of the symptoms, is described. Reference is made to a rise in the arterial tension in the lower limbs in certain cases.

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OBSERVATIONS ON THE BEHAVIOUR OF ERYTHROBLASTS CULTURED IN NORMAL AND "PERNICIOUS ANAEMIA" SERA

BY

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Attempts to account for the action of Vitamin B₁₂ and folic acid in megaloblastic anaemias have led to reconsideration of the classical theory of the aetiology of pernicious anaemia. One of the new hypotheses is that advanced by Lajtha (1950), based largely on the results of marrow culture experiments. He confirmed the observation of Osgood and Brownlee (1937) that if megaloblastic bone marrow from a patient with pernicious anaemia in relapse is cultured the megaloblasts disappear more rapidly when the medium contains normal serum than when it contains serum from an untreated case of pernicious anaemia. He set up cultures with media containing different proportions of pernicious anaemia serum, and considered that the figures for differential counts showed that more megaloblasts persisted in the medium containing the higher proportion of pernicious anaemia serum. Lajtha therefore suggested that there exists in the blood of patients with pernicious anaemia a factor inhibiting the maturation of megaloblasts into either erythrocytes or normoblasts. Thompson (1950) has published evidence in favour of this suggestion.

The method employed by these workers is a modification of that described by Osgood and Brownlee (1937), using a fluid culture medium: this has the great advantage over methods employing a solid medium in that

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quantitative estimation of the changes occurring is possible. In the published results of the experiments of Lajtha and of Thompson the changes observed have been expressed as proportionate changes within the erythroblast population derived from differential cell counts performed on slides. Lajtha (1950) states that calculated absolute counts obtained by applying these changes of proportion to the total cell count confirm that they represent real, and not merely relative, changes in the numbers of cells.

In view of the possible errors introduced by the counting methods employed and the possibility of variations in the proportion of erythroblasts to other cells, as may well occur in such experiments, we thought it necessary to investigate this assertion.

A preliminary step was to devise a method of counting one element of a bone-marrow suspension with a known degree of accuracy; the method adopted is described elsewhere (Sharp, Feinmann, and Wilkinson, 1952), together with a suggested modification, use of which will lessen counting labour. Briefly, an estimate of known accuracy of the count of the total nucleated cells per unit volume is made; the estimate of the proportion that the marrow element forms of the total nucleated cells, also of known accuracy, is derived from differential counts on a series of cover-slip smears. An estimate of the number of the cells concerned per unit volume may thus be obtained. Application of a formula gives the error of this estimate.

The culture technique we have used is described in detail, since, so far as we are aware, an account of the important modifications of Osgood and Brownlee's (1937) method, largely introduced by Lajtha, has not appeared in the literature, and we have found strict attention to details of technique to be essential.

Materials and Methods

1. Universal containers (30 ml.) roughly graduated at 4-ml. intervals were used for storing fluids and as culture vessels. The internal rubber caps of these were wrapped in "cellophane" to prevent contact of rubber with the culture. The internal surfaces of containers used as culture vessels were treated to prevent adherence of cells of the granulocytic and monocytic series (Lajtha, personal communication) by exposure for a few seconds to liquid dimethyldichlorosilane (Dow-Corning), care being taken that all parts of the surface came into contact with the fluid, followed by washing with running tap-water for two days and then in distilled water for seven days. The assembled containers were sterilized in the autoclave at 15 lb. (1.05 kg. per cm.²) pressure for 30 minutes.

2. All-glass syringes, needles, and Salah sternal puncture needles were "siliconed" by the process described, stored in large test-tubes with non-absorbent wool plugs, and dry sterilized at 160° C. for one hour.

3. Pasteur pipettes and Wintrobe haematocrit tubes were not "siliconed," since it was found that such treatment prevents adequate mixing of the cell suspensions in a narrow tube. The specimen is in contact with these "unsiliconed" glass surfaces for only a few minutes, so that adhesion of cells to the untreated surface is unlikely to be a serious factor.

4. "Siliconed" watch-glasses.

5. Gey's salt solution (Gey and Gey, 1936) was used:

	g./litre		g./litre
NaCl	8.000	Na ₂ HPO ₄ .2H ₂ O ..	0.150
KCl	0.370	KH ₂ PO ₄	0.030
NaHCO ₃ ..	0.227	MgSO ₄ .7H ₂ O ..	0.070
CaCl ₂ anhyd. ..	0.170	Glucose	1.00
MgCl ₂ .6H ₂ O ..	0.210		

It should be noted that quantities of the concentrated stock solutions recommended in the above paper do not give the final concentration of salts desired. The solution was filtered through sintered glass and stored at 4° C. in universal containers, approximately 18 ml. in each.

6. Counting and staining materials are detailed elsewhere (Sharp, Feinmann, and Wilkinson, 1952).

7. Human serum was obtained under sterile conditions and stored in universal containers at 4° C. Serum stored longer than 28 days was not used.

Culture Technique

It was found, using the ordinary bacteriological sterile technique, that all operations could be performed on an open bench without fear of contamination; it was unnecessary to keep a room specially for this culture work.

At the beginning of an experiment containers of the sera to be used and of Gey's solution were warmed in an incubator at 37° C. Sternal marrow puncture was performed by the usual technique, 2 ml. of marrow being extracted by sudden forceful suction; it was found that in cases where any difficulty was experienced in aspirating the marrow clotting tended to occur and the cellularity of the resulting specimen was almost invariably too low for culture purposes. A few drops of aspirate were used for making diagnostic smears, and the remainder was introduced rapidly into 18 ml. of warm Gey's solution in a universal container and thoroughly agitated. Heparin was not added to the Gey's solution in view of the evidence that it may inhibit mitosis (Paff *et al.*, 1947; Heilbrunn and Wilson, 1949). We did not encounter clotting of specimens freely aspirated.

After mixing for approximately 10 minutes the suspension was centrifuged at 2,000 r.p.m. for 15 minutes, the supernatant liquid removed, and the volume made up to approximately 10 ml. with Gey's solution. We found that transfer of accurate volumes of fluid from a syringe by piercing the rubber cap of a container as described by Osgood and Brownlee was difficult and apparently unnecessary. The new suspension was thoroughly agitated and a nucleated cell count was made; depending on this count, the volume was adjusted to give a nucleated cell count of 15,000–20,000 per c.mm. The final volume achieved decided how many experiments could be performed with the material available.

"Siliconed" syringes and needles were used to set up cultures in warmed siliconed universal containers. The composition of these is shown in Table 1.

TABLE I

Marrow Suspension	Pernicious Anaemia Serum	Normal Serum	Gey's Solution	Concentration of Serum in Medium
1 ml.	2 ml.	0	2 ml.	40% P.A.
1 "	3 "	0	1 "	60% "
1 "	0	2 ml.	2 "	40% normal
1 "	0	3 "	1 "	60% "

Each culture bottle was thoroughly agitated for two minutes, after which approximately 2 ml. of the contents was removed by Pasteur pipette. About 0.5 ml. of this was taken for an immediate pH estimation by glass serum electrode, sufficient for nucleated cell counts was placed on a "siliconed" watch-glass, and the remainder introduced into Wintrobe haematocrit tubes and spun at 3,000 r.p.m. for approximately 30 seconds. The supernatant liquid was removed and the deposit thoroughly agitated by repeated aspiration into a Pasteur pipette; drops from this pipette were made into 12 to 30 cover-slip smears by the usual technique. These represented the "zero hours" preparations and estimations.

The remaining 3 ml. of the culture, forming a layer 7 to 8 mm. deep, was incubated for 48 hours at 37° C. Specimens were then taken for incubation on blood agar as a test of sterility, and pH estimations, cell counts, and smears were taken as before.

It was found essential to make the initial differential cell counts from "zero hours" preparations and not from the diagnostic smears made direct from the sternal puncture needle. In the medium used there is a tendency for the pattern of nuclear chromatin to "open out," so that a marrow specimen which appears mainly "normoblastic" in the diagnostic smears is often found to be mainly "megalo-blastic" in the "zero hours" preparations.

The methods of counting the nucleated cells and of staining and differential counting of smears are detailed elsewhere (Sharp, Feinmann, and Wilkinson, 1952).

Experiments

Sternal marrow was obtained from three patients and used for 20 culture experiments. The patients were suffering from untreated pernicious anaemia in relapse; all had haemoglobin levels between 35 and 40% (4.2 to 4.9 g./100 ml.) and reticulocytes 2% or less, and they fulfilled the recognized diagnostic criteria. The marrows from patients A and B were cultured in their own sera and that from patient C in pernicious anaemia serum from another untreated patient of the same blood group whose haemoglobin level was 36% (4.3 g./100 ml.) and reticulocyte count 1.2%. Each marrow was cultured in normal serum of its own group.

In our hands the method employed was not invariably successful. Other experiments were performed, but were discarded for purely technical reasons, the most common being that adequate counting of a sufficient number of smears was not possible. The most common cause of failure was making the cover-slip smears too thin, the resultant damage to cells rendering a high proportion unrecognizable. In some experiments clumping of leucocytes, particularly polymorphonuclears, despite a constant mixing technique, and in others the appearance after incubation of numerous reticulum cells resembling erythroblasts, made accurate differential counting impossible. A rise of incubating temperature to over 38° C. was usually associated with haemolysis and destruction of the culture. Use of serum of a different blood group from that of the marrow resulted in either agglutination or haemolysis.

It should be noted that the stored serum is at all times in contact with air; consequently, the pH of the medium initially is usually high—for example, 7.8. Change of pH of the medium during the experiment has been variable and unpredictable; the tendency towards an acid pH on incubation observed in some cases is probably due in part to the accumulation of lactic acid (unpublished data).

Although the appearance of cells in tissue culture under such conditions is not normal, we have found it possible to use the criteria advocated by Israëls (1948) for recognition of cells. Differential counts were performed by two observers (E. L. F. and J. S.). Controlled studies indicated that we were unable to differentiate proerythroblasts from early megalo-blasts in a reproducible manner. For this reason proerythroblasts and megalo-blasts have been considered as one group and are hereafter referred to as "P. + M."

A protocol of one experiment is given in the Appendix.

Results

In Tables II and III the absolute number per cubic millimetre of P. + M. in the various media before and after incubation is indicated.

Interpretation of Results

In 40% pernicious anaemia serum there is a significant decrease in numbers of P. + M. in one of six experiments. In 60% pernicious anaemia serum the decrease is significant in three of five experiments. A significant fall occurred in three of four experiments in 40% normal serum and in all five experiments in 60% normal serum. Comparison of results in this way assumes that the rate of change of num-

TABLE II.—P. + M./c.mm. Before and After Incubation in Media Containing 40% and 60% Pernicious Anaemia Serum

Exp.	Time Hrs.	40% Pernicious Anaemia Serum				60% Pernicious Anaemia Serum			
		P. + M./c.mm.	S.E.	Difference 0-48 hrs.	(S.E. of D.) × 2	P. + M./c.mm.	S.E.	Difference 0-48 hrs.	(S.E. of D.) × 2
A ₁	0 48	305 155	98 51	} 150	222				
A ₂	0 48	304 259	124 90						
B ₁	0 48	511 251	125 113	} 260	337				
B ₂	0 48	722 288	148 133						
C ₁	0 48	879 347	266 107	} 532	574				
C ₂	0 48	549 260	150 107						
A*	0 48					369 113	119 46	} 256	256
A ₁	0 48					374 111	111 55		
B ₁	0 48					423 165	110 78	} 258	270
C ₁	0 48					734 301	172 126		
C ₂	0 48					709 329	174 95	} 380	396

TABLE III.—P. + M./c.mm. Before and After Incubation in Media Containing 40% and 60% Normal Serum

Exp.	Time Hrs.	40% Normal Serum				60% Normal Serum			
		P. + M./c.mm.	S.E.	Difference 0-48 hrs.	(S.E. of D.) × 2	P. + M./c.mm.	S.E.	Difference 0-48 hrs.	(S.E. of D.) × 2
A ₁	0 48	324 16	88 11	} 308	178				
A ₂	0 48	354 9	95 11						
B ₁	0 48	495 13	152 14	} 482	306				
B ₂	0 48	500 131	190 76						
A ₇	0 48					311 22	119 25	} 289	244
A ₈	0 48					321 15	144 13		
B ₄	0 48					542 51	177 31	} 491	360
C ₅	0 48					681 23	203 21		
C ₆	0 48					808 17	186 18	} 791	374

bers of P. + M./c.mm. under these conditions is a linear function. In order to avoid this assumption, the results have been further analysed in the following manner:

The mean numbers, averaged over marrows, of P. + M./c.mm. at zero hours have been calculated for all experiments in media containing pernicious anaemia serum and for all experiments in media containing normal serum. The former mean is 535.92 and the latter 528.11. The difference between these means is not significant: $t = 0.19$; d.f. 11; $0.9 > P > 0.8$.

Calculation of similar means at 48 hours gives a result of 234.38 for media containing pernicious anaemia serum and 33.5 for those containing normal serum. The difference between these means is highly significant: $t = 10.95$; d.f. 11; $P < 0.01$. This indicates a significantly greater decrease in numbers of P. + M. in media containing normal serum than in those containing pernicious anaemia serum.

The mean number of P. + M./c.mm. at zero hours in media containing 40% pernicious anaemia serum was 378.33 and in media containing 60% pernicious anaemia serum 505.33. The difference between these means is, however, not significant: $t = 1.64$; d.f. 5; $0.2 > P > 0.1$.

The comparable means at 48 hours were 259.83 for 40% and 197.3 for 60% pernicious anaemia serum. The difference between these means is also not significant: $t = 2.2$; d.f. 5; $0.1 > P > 0.05$.

The results therefore demonstrate no significant difference in the behaviour of the numbers of P. + M. in media containing 40% and 60% pernicious anaemia serum.

The data have been analysed to find if there is evidence of any individual difference in behaviour of the three marrows in these experiments. For each of the marrows, A, B, and C, the difference between the average numbers of P. + M./c.mm. in experiments using media containing 40% and those using 60% pernicious anaemia serum has been calculated separately at zero hours and at 48 hours. The variance of these differences around the mean difference has been compared with the total variance of estimates of the numbers of P. + M./c.mm. around the mean numbers for all experiments using pernicious anaemia serum, at each period.

At zero hours:

The variance of the difference = 18,622.5 (d.f. 2)

The total variance = 15,407.1 (d.f. 5)

$$z = 1.1513 \log_{10} \frac{18,622.5}{15,407.1} \\ = 0.0946$$

At 48 hours:

The variance of the difference = 4185 (d.f. 2)

The total variance = 2036.9 (d.f. 5)

$$z = 1.1513 \log_{10} \frac{4185}{2,036.9} \\ = 0.36$$

The 5% point of the distribution of z is at 0.8777, so that neither of the calculated values of z is significant.

There is thus no evidence that the individual marrows responded differently in respect of change in numbers of P. + M./c.mm. in the two concentrations of pernicious anaemia serum.

Discussion

These results confirm the reports of previous investigations that there is a difference between the action of pernicious anaemia serum and normal serum on megaloblastic bone marrow under the conditions of the experiments, and demonstrate that the difference is significant. It seems possible that the observed difference in behaviour of the marrow cells, as judged by morphological appearances, may be accompanied by biochemical changes in the media or histochemical changes in the cells capable of more exact measurement. Such studies may give information of fundamental value regarding the processes of normal and pathological erythropoiesis.

The results do not provide evidence for the presence of an inhibitory factor in pernicious anaemia serum, since no significant difference was observed between the effects of concentrated and dilute pernicious anaemia serum. It is recognized that the results do not rule out the possibility of a very powerful inhibitor active in such high dilution that the differences in its effect in the dilutions of serum employed were not measurable by this method. The concentrations of serum used, however, were closely comparable to those used by Lajtha.

Further evidence for the existence of an inhibitory factor has been put forward by Lajtha (1950). He reports culture of megaloblasts from normoblastic bone marrow in pernicious anaemia serum; these mainly appeared after 72 hours'

incubation. In our hands the preservation of the culture at 72 hours was usually poorer than at 48 hours, and in cultures of five normoblastic marrows in pernicious anaemia serum the only definitely recognizable erythroblast in 72-hour cultures has been the late normoblast.

The changes in number of a cell type during culture must be a complex process involving cell division, maturation, and degeneration. To what extent each of these factors is operative in a particular culture cannot at present be determined using this culture technique. While there is evidence from other sources that transition of megaloblast to normoblast may take place *in vivo* on the institution of suitable treatment (Horrigan *et al.*, 1951), there is no conclusive evidence that such a change occurs under the conditions of these experiments. It would appear hazardous, therefore, to postulate that the effects *in vitro* of therapeutic agents added to the culture medium are identical with those occurring on exhibition of these agents *in vivo*.

Summary

Megaloblastic bone marrow from cases of pernicious anaemia has been cultured in media containing pernicious anaemia and normal sera respectively.

When incubated for 48 hours in media containing normal serum the decrease in numbers of proerythroblasts and megaloblasts is significantly greater than when the media contains pernicious anaemia serum.

No evidence has been found that the difference is due to an inhibitory factor in pernicious anaemia serum.

Appendix : Protocol of Counts of Experiment A₂ at 0 Hours

(a) Percentage of Erythroblasts which are P. + M.—The counts contributing to this mean are shown in Table A.

TABLE A

Cover-slip No.	Proerythroblasts per 100 Erythroblasts	Megaloblasts per 100 Erythroblasts	P. + M. 100 Erythroblasts	(Difference from Mean) ²
14	6	40	46	25
15	4	34	38	169
16	7	52	59	64
17	5	62	67	256
18	6	48	54	9
19	1	52	53	4
20	14	49	63	144
21	8	46	54	9
22	14	25	39	144
23	14	22	36	225
24	8	52	60	81
25	7	33	40	121
Total	94	515	609	1,251
Mean	8	43	51	

$$\text{Standard deviation of P. + M. mean} = \sqrt{\frac{1251}{11}} = 10.7.$$

(b) Percentage of Total Nucleated Cells which are Erythroblasts.—The counts contributing to this mean are shown in Table B.

TABLE B

Cover-slip No.	Erythroblasts per 100 Total Nucleated Cells	(Difference from Mean) ²
14	46	119
15	25	102
16	50	222
17	21	199
18	29	37
19	41	35
20	20	228
21	34	1
22	55	396
23	34	1
24	31	17
Total	386	1,357
Mean	35.1	

$$\text{Standard deviation of this mean} = \sqrt{\frac{1357}{10}} = 11.7.$$

(c) *Total Nucleated Cell Count*.—Suspension diluted 1/10 in three pipettes, each of which was used to fill a separate counting chamber.

Number of cells counted in the three chambers 67, 65, and 73 respectively. Mean number of cells counted = 68.

Dilution factor = 1/25

∴ Total nucleated cell count = 1,700/c.mm.

Coefficient of variation of this count:

$$= \sqrt{\frac{100^2}{n} + \frac{4.6^2}{n_c} + \frac{4.7^2}{n_p}}$$

Where n = the number of cells counted.

n_c = the number of counting chambers used.

n_p = the number of pipettes used.

$$= \sqrt{\frac{100^2}{205} + \frac{4.6^2}{3} + \frac{4.7^2}{3}} = 7.96\%$$

∴ Standard Deviation = 136

Calculations:

(i) The percentage of P. + M. of total nucleated cells:

$$\left(\frac{\text{i.e., } a \times b}{100}\right) = \frac{51}{100} \times 35.1 = 17.9$$

The standard deviation of this product is obtained from the formula:

$$\sigma = \sqrt{\sigma a^2 \cdot \sigma b^2 + \sigma a^2 \cdot \bar{b}^2 + \sigma b^2 \cdot \bar{a}^2}$$

where $\bar{a}$ is the mean percentage of erythroblasts which are P. + M. and σa is its standard deviation, and $\bar{b}$ is the mean percentage of total nucleated cells which are erythroblasts and σb its standard deviation.

$$\text{i.e., } \sigma = \sqrt{\frac{(10.7^2 \times 11.7^2) + (10.7^2 \times 35.1^2) + (11.7^2 \times 51^2)}{100}} \\ = 7.2$$

(ii) The number of P.+M./c.mm. (i.e., $\frac{(a \times b)}{100} \times c$)

$$= \frac{17.9}{100} \times 1700 = 304.$$

The standard deviation of this figure

$$= \sqrt{\left(\left(\frac{7.2}{100}\right)^2 \times 136^2\right) + \left(\left(\frac{7.2}{100}\right)^2 \times 1700^2\right) + \left(136^2 \times \left(\frac{17.9}{100}\right)^2\right)} \\ = 124$$

We wish to thank Professor Bartlett and Miss N. Goodman for their help with the statistical aspects of this study; Mr. A. Duval for deriving the formula for the standard error of the product of two independent variables; and Dr. L. G. Lajtha for giving us a full account of his methods. The work was supported by a grant from the Medical Research Council and was carried out during the tenure by one of us (E. L. F.) of a B.M.A. scholarship.

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NORWEGIAN SCABIES

BY

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In September, 1950, some female patients in the dermatological and tuberculosis wards at University College Hospital complained of itching spots. These wards were next to each other and were staffed by the same nurses. Intensely itchy scratched papules were scattered over the waist, buttocks, and thighs, while one patient had papules on the arms and a few vesicles on the palms. On the whole the eruption suggested scabies, but we could not find burrows in any of the cases, nor was there any trace of mites on scraping areas of skin and examining the scales microscopically.

Within a few days seven nurses had complained of itching. They all showed scattered scratched papules on the arms, and some of them on the thighs. Again after careful examination it was impossible to make a certain diagnosis in the absence of burrows and with the atypical distribution of lesions. It was decided to treat patients and nurses for scabies, and indeed there was a satisfactory response to paintings with emulsion of benzyl benzoate.

During October other cases occurred in these two wards, the total affected being 12 ward patients, 17 nurses, 1 ward maid, and 2 medical staff. By this time three cases had been seen with typical scabious burrows in which the acarus was found.

Thus we were confronted with an explosive outbreak of scabies confined to two wards, where both patients and nurses were affected, and in which most of the cases were atypical. At this point Dr. W. Freudenthal drew our attention to a similar puzzling epidemic of highly infectious scabies that had occurred at Breslau in 1927 (Hahn, 1928), where the source of infection was eventually found to be a case of Norwegian scabies that had not at first been recognized. In looking for a case of this kind we remembered a woman with a scaling dermatosis in which the diagnosis was uncertain. She had been in the dermatological ward from August 31 till October 18, 1950, when she had been transferred to a ward for chronic sick at St. Pancras Hospital. This patient was re-examined and was found to be swarming with scabies mites, the scaling and density of parasitization fitting the picture of mild Norwegian scabies.

Within the next few days several old ladies in the ward at St. Pancras Hospital complained of itching. They were found to have scratched papules on the waist, thighs, and buttocks, and a few had lesions on the arms, but burrows were not seen. Nurses were found to be affected with extremely itchy papules on the arms. When the source of infection had been removed, no fresh cases appeared among the nursing staff, but during the next two months further cases gradually incubated among the patients in that ward. In fact, every patient who had been in the ward at the time when the case of Norwegian scabies was untreated became infected. The total was 24 ward patients, 10 nurses, and 1 ward maid. Burrows were found in two of the cases that had incubated scabies very slowly, but the rest were atypical and showed no burrows or lesions of the wrists and fingers.

According to *Time* (June 16) there has been great public interest in the United States in the new drug isonicotinic acid hydrazide. The Food and Drug Administration has now authorized the general use of the drug on any doctor's prescription, and so great has been the public demand that Macy's, the well-known store in New York, advertised in the *New York Times* that they were able to supply it.