material is abundantly available in the child welfare clinics of the local authorities, and especially those attached to teaching maternity hospitals. What is needed is that all paediatric departments in medical schools should include infant and child welfare clinics as a part of their work in treatment, teaching, and study; that separate courses of instruction in child health should be given both to medical students and to pupil health visitors and midwives; and that this instruction should in the first place be mainly directed to the problems of infant health and should include the critical period of the first month.

In the U.S.A. paediatrics has long enjoyed the status of a major subject in the medical curricula. There has been a great fall in infant mortality in the leading American cities in the last 20 years, and it is reasonable to claim that this fall has been influenced by the high standard of paediatric teaching in the American medical schools. In most British medical schools paediatrics is still ranked as a "special" or minor subject. Until this great subject is given its right place in British medical education we cannot expect much improvement in its practice.

Practice

The general practitioner, the hospital practitioner or paediatrician, and the medical officers of the infant welfare and school medical services are at the disposal of mothers for the care and well-being of infants and children. The family doctor handles the problem at its centre, in the home, where the issue of health or disease is decided. He is well placed to make the greatest contribution to infant health, but complains that he is being ousted from it. The paediatrician is fully engaged in the problems of disease in children's hospitals—although a few paediatricians, attached to the welfare clinics of maternity hospitals, are beginning to take part in the health side of the problem. The medical officers of the child welfare clinics are busily engaged there, but form a semi-detached service. They see too little of the health problem in the home and are debarred from the intensive clinical study of the child in hospital. These three services have but slight contact with each other; their liaison is weak, and there is a good deal of recrimination between them. Indeed, each of them is open to attack: for the child welfare doctors and the family doctors have not received a proper training in child health; and the hospital doctors, expert in the problems of disease, have little experience either of home conditions or of the work of child welfare clinics.

It is agreed that this is a most unsatisfactory position; and a good deal of purposeful discussion is going on at the present time to improve it. In the draft interim report of the Medical Planning Commission (1942) plans are outlined to give general practitioners an increasing share in the work of welfare clinics. The British Paediatric Association has also recently brought together in conference paediatricians, general practitioners, child welfare medical officers, and medical officers of health to exchange views and to plan a co-ordinated health service for children. There are great difficulties to be overcome; and before a reorganized child health service can be brought into being there must be full and free discussion of its structure and conditions between all those who will operate it. What is needed is a service in which there will be two kinds of medical personnel—the family doctors carrying out the routine work in the home and the clinic, and the hospital physician advising and directing; while the health visitors will be at the disposal and under the supervision of both. This service cannot work without control; it must have administrative machinery, and must be "under authority." The general solution of this difficult problem of the controlling authority may be found in some local experiment of a co-ordinated child health service—some happy area where there are already friendly relations between the child welfare service, the family doctors, the children's hospitals, and the medical school.

The Fundamental Postulates of Child Health

The medical and nursing services are not the only elements in the complete plan necessary for child health. There are other fundamental postulates which must be provided: general sanitation on a high standard, achieving cleanness and counter-infection in the city, the street, and the air overhead; houses with liberal accommodation and suitable equipment for parents and children; an income-level sufficient to provide food and

the other necessities of life. The central postulate of all is the mother herself; in the last resort the health of the child depends upon the mother's health, her knowledge of her craft, and her devotion. The nurse and the doctor may give her health and knowledge; but the ultimate responsibility for the care of the child rests with the mother, and the centre of the child's life is the home. Day nurseries and nursery-schools cannot take the place of good homes. Minders, be they ever so mindful, cannot take the place of mothers. The family is a human society—the oldest, the smallest yet the greatest, of all human societies. If the family is to be secure and stable it must have all these things that have been mentioned; and it must also be governed by moral and religious laws as well as by the laws of economics, medicine, and hygiene.

Sir William Beveridge has given us his design and plan for national security and health, and has said that "the foundations of healthy life must be laid in childhood." Not unlike his plan, but with a theocratic as well as a democratic foundation, is the Psalmist's dream of a happy and secure society:

That our sons may grow up as the young plants:

That our daughters may be as the polished corners of the temple.

That our garners may be full and plenteous with all manner of store: . . .

That there may be no decay: no leading into captivity, and no complaining in our streets.

Happy are the people that are in such a case:

Yea, blessed are the people that have the Lord for their God.

Psalm 144.

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SOME ASPECTS OF THE CHEMOTHERAPY OF PNEUMONIA

BY

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That the value of chemotherapy in pneumonia has, in a general way, been proved is a reasonable assumption. The present analysis is put forward in the belief that certain aspects of the results obtained with sulphonamides are not sufficiently or generally appreciated.

The Value of Aetiological Diagnosis

It is well known that in a large proportion of pneumonias the causal organism is a pneumococcus, and that among pneumococcus pneumonias there is considerable variation in the severity of the illness caused by different serological types. It is not so well known that there are differences in the fatality rates when cases receive sulphonamides. In Glasgow, where over a long period of time the commonest type of pneumococcus has been Type II, carrying a high fatality rate, the results of chemotherapy have been less impressive than in the South of England, where the more benign Type I infection is prevalent. My own figures in two relatively large series of cases (Table I) may be cited. The material comprises all

TABLE I

Type	Pre-sulphonamide		Sulphonamide	
	Cases	Deaths	Cases	Deaths
I	172	13 (8%)	64	2 (3%)
II	198	58 (29%)	160	20 (12%)
III	27	4 (15%)	48	15 (31%)
V	—	—	8	1 (12%)
VII	—	—	26	4 (15%)

cases admitted in which the notified diagnosis of "acute primary pneumonia" was confirmed. The great majority conformed to the lobar type of consolidation. Sulphapyridine was given by mouth; after a preliminary dose of 2 g., treatment was continued with 1 g. four-hourly until the temperature had been normal for a period of two to three days. I have included the results obtained with chemotherapy in

Type V and Type VII infections, since clinically, in respect of course and severity, they behave very similarly to Type II infections.

I have been the more convinced of the accuracy of the picture to be drawn from these figures by collecting together a number of cases treated in different Glasgow hospitals (Anderson, 1940). In so far as Type I and Type II pneumococcus infections are concerned the result is the same: Type I infections are now usually mild, death resulting from some complicating condition often unconnected with the pneumonic process; whereas Type II infections are more severe and still carry an appreciable fatality rate. The results obtained in Type III infections are more variable; the most important factor here is the age of the person infected. In the older age groups infections with this type are severe and often fatal; but when younger persons are infected the illness produced by Type III pneumococci is milder and the fatality rate low. During 1939-40 and into the beginning of 1941 the Type III cases were predominantly among the older age groups and carried a correspondingly high fatality rate. These figures are, I believe, sufficient justification for stressing the necessity for the continuation of pneumococcus typing, even when the sulphonamides are being used.

The Age of the Patient

In analysing my own figures I have been impressed by the increased importance of age in the results obtained by chemotherapy in pneumonia. In Table II the total figures for Type I, II, and III infections have been divided into two groups, below and above 40 years.

TABLE II.—Results in Respect of Age in Type I, II, and III Pneumococcus Infections

	40 Years and Under		41 Years and Over	
	Cases	Deaths	Cases	Deaths
Pre-sulphonamide ..	288	40 (14%)	109	35 (32%)
Sulphonamide ..	151	6 (4%)	121	31 (26%)

It is clear that the reduction in fatality is much more impressive under the age of 40 than above it. If Type II infections alone are considered we find that the fatality rate under 40 has fallen from 22 to 4%, whereas in the older age group the fall is from 46 to 25%. Further, an analysis of 69 consecutive deaths from pneumonia of persons over the age of 11 years who received sulphapyridine has shown that no fewer than 56 (81%) of these patients were 41 years of age or over. In Cruickshank's analysis (1942) of cases of pneumonia treated in the Glasgow Fever Hospital from 1918 to 1928, only 40% of the deaths of patients above the age of 11 occurred in those over 45 years old: 68% of my deaths are in this age group.

Effect of Age and Bacteraemia

Table III shows the results of an analysis of 168 cases examined by blood culture on admission to hospital.

TABLE III.—Effect of Age and Bacteraemia on the Outcome of Pneumonia

Age	Non-bacteraemic		Bacteraemic	
	Cases	Deaths	Cases	Deaths
40 years and under ..	70	2 (3%)	20	3 (15%)
41 years and over ..	56	9 (16%)	28	13 (47%)

($\chi^2=14.4$; P =less than 0.01)

This table contains some important data. The first inference to be drawn from it, of course, is the importance of the presence of bacteraemia when treatment is begun. But the occurrence of bacteraemia must be regarded either as a gain for the pneumococcus in its invasive capacity or as a loss for the host in his defensive capacity. There is some reason for believing that the risk of the development of bacteraemia increases as age advances. May it not be that the relative failure of sulphapyridine in those over the age of 40 with bacteraemia is due more to the impoverished defences of the host, which have allowed invasion to occur, than to the actual presence of bacteraemia itself? Our present conception of

recovery from acute infections lays much emphasis upon the causative "virus," its different attacking mechanisms, and the immunological changes which it causes in the human host. Just because it is more nebulous and difficult to define we tend to set aside the non-specific or tissue resistance, although we fully appreciate its importance in the host's chances of recovery.

Age, Bacteraemia, and the Process of Resolution

One further set of figures may be supplied. In my hands, one of the most disturbing features of the case of pneumonia receiving chemotherapy has been the frequency with which convalescence is delayed by what might almost be termed the failure of resolution. Table IV shows the incidence of the condition in a series of unselected cases in respect of the two factors already discussed—namely, age and bacteraemia.

TABLE IV.—Age, Bacteraemia, and the Incidence of Delayed Resolution

	Cases	Cases with Delayed Resolution
Non-bacteraemic	165	21 (13%)
Bacteraemic	59	15 (26%)
40 years and under	151	17 (11%)
41 years and over	121	27 (22%)

The figures in Table IV show that the incidence of delayed resolution is much higher in those over 40 years and in those with bacteraemia. Again it seems to me that it is not sufficient merely to say that this complication is occurring in the severer case. In the person over 40 years old and in those with bacteraemia the "tissue resistance" may be lacking; it might be reasoned that failure to restore the inflamed lung to normal is likely to be due to a failure of tissue resistance. Many of the cases upon which I have performed a necropsy have been found to show upon their tenth or twelfth day a totally hepatized lobe, in which microscopically there is great increase of connective tissue, the fibrin being interwoven by strands of fibrous tissue.

Discussion

It is a natural tendency of the enthusiastic clinician to produce fatality rates as low as he can make them. Where the factors which influence the fatality rate are few little harm can result. But where, as in pneumonia, the factors which influence the fatality rate are many, then it is desirable that he should not undercolour the shadows. These figures have been selected to emphasize the fact that the introduction of the sulphonamide group of drugs has not removed pneumonia from that group of diseases which still requires intensive study. There is evidence that age now assumes an even more important place in prognosis than it did in the pre-serum or pre-sulphonamide days, and that the risk of death, or of a prolonged convalescence, is much greater in those who are past the middle stage of life. A close relation is also shown between outcome and the presence of bacteraemia when treatment is begun.

These findings suggest that with the introduction of the newer sulphonamides the last word on the treatment of pneumonia has not yet been written. There apparently remains a broad age group in which the disease has a high relative prevalence and in which the individual's chance of recovery, once he is attacked, is less favourable. Nor can it be too greatly emphasized that the loss of a life between the ages of 40 and 60 years constitutes a severe economic blow; for by this time the individual's responsibilities in society and in family life are often greatest. A problem exists, and must be faced, in regard to the more effective treatment of these "bad risk" cases. In the light of our present knowledge three lines of approach may be discussed.

In the first place the combination of chemotherapy with type-specific serums or vaccines must be considered. Comparative trials of combined treatment and of sulphonamides alone have been reported from America (e.g., Plummer *et al.*, 1941). The results do not encourage a belief that added benefit is secured by combined therapy. My own final assessment of a small group of cases does not bear out the promise of the earlier results (Anderson and Cairns, 1940). Serum-and-drug treatment was given to 33 patients with Type II pneumo-

coccus pneumonia. In respect of those over 40 years of age the fatality rate was 25%; delayed resolution was noted in 29%. These findings confirm, on a small scale, the reports of the larger American studies. Vaccines have also been used in two series of Glasgow cases. Dick (personal communication) treated alternately two groups of cases in 1941-2—one with sulphapyridine alone, the other with sulphapyridine plus autogenous vaccines. In respect of fatality rates and incidence of delayed resolution there was no difference between the two groups. My own small experience with type-specific stock vaccines is similarly discouraging. Fleming (1939) has produced strong experimental evidence in support of the use of the combined methods of treatment as compared with either alone. The apparent failure of combined therapy in man must thus be earnestly considered; for since, alone, both achieve a beneficial effect the argument in favour of their combination seems a strong one. It may, of course, be that the fatality rate has been reduced to its lowest level by means of chemotherapy and that those who now die represent a non-resistant population in whom the infection runs a course too rapid for successful intervention. Such a view would be disquieting; but it should in its own way direct attention to the individual, underlying failure which permits lowered resistance to the infection. May it not be, on the other hand, that chemotherapy in man achieves its effect by a host-response different from that of specific serotherapy? The non-specific nature of the action of sulphonamides does not perhaps receive the attention it merits: one drug is successful in infections due to a wide range of micro-organisms. The finding in severe cases of pneumonia—many of which would previously have ended in death—that the return of the consolidated lung to normal is a long slow process suggests that tissue resistance is an essential adjuvant of chemotherapy.

It may finally be asked whether a more intensive course of chemotherapy during the preliminary stage of treatment might not be worthy of trial in these patients over the age of 40. The use of age alone as the criterion might be advocated, since it would seem reasonable that for beneficial effect intensive therapy should be used during the first 24 hours, before the results of blood culture could be known. It would, finally, seem especially desirable when the results of chemotherapy in pneumonia are reported that emphasis be placed upon the analysis of the cases in respect of the type of infecting pneumococcus, the age of the patient, and the presence or absence of bacteraemia when treatment is begun.

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RECEPTION TO PROF. SARKISOV

A largely attended reception was given on May 21 by the Society for Cultural Relations with the U.S.S.R. in honour of Prof. S. A. Sarkisov, representative of the Soviet Red Cross and Red Crescent, director of the Moscow Institute of the Brain, and vice-president of the Scientific Medical Council of the U.S.S.R. The Soviet Ambassador and Mme. Maisky were present, as well as many representatives of the medical services, British and Allied. The company were received by Mr. D. N. Pritt, K.C., and Mrs. Pritt, and a welcome to the guest of honour was spoken by Mr. Aleck Bourne. Prof. Sarkisov, who spoke in Russian, expressed his gratitude for this friendly welcome. Never in the history of mankind, he said, had the scientific and cultural values created by the centuries been exposed to such barbaric destruction as was taking place now. Therefore the growing tendency towards the establishment and widening of the collaboration between cultural, art, and scientific workers in the Soviet Union and the countries friendly to the U.S.S.R. was quite natural. He added that the Soviet intelligentsia, together with the whole Soviet people, were working to help the heroic Red Army against the invaders. As a representative of Soviet medical science he hoped to make scientific medical circles in Great Britain more closely acquainted with the work which Soviet medical men and women were carrying out both at the front and at the rear. He hoped also to become more closely acquainted with the work of the medical institutions of Great Britain in order that in turn he could make the Soviet public acquainted with them. He concluded with expressing his belief that the peoples of the two countries were bound not only in comradeship-in-arms but in an alliance for a long period after the war.

ENTERIC GROUP FEVERS IN PRISONERS
OF WAR FROM THE WESTERN DESERT

WITH SPECIAL REFERENCE TO PROPHYLACTIC
INOCULATION, JAN., 1941, TO FEB., 1943

BY

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Intelligence reports received during the latter part of 1940 indicated that fevers of the enteric group were of common occurrence among Italian troops in Libya. The first Libyan campaign—1940-1—resulted in the capture of unexpectedly large numbers of prisoners, and the available accommodation for their custody was at first stretched to its limit. Until this was adjusted the sanitation of the P.O.W. camps was inevitably of a makeshift type, and the complete lack of sanitary conscience which is common to the Latin races made control a matter of very considerable difficulty. In the circumstances it is surprising that a large-scale outbreak of bowel disease was avoided.

The 1940-1 Outbreak

A small wave of typhoid fever occurred in one of the camps, but by the end of January it was under control. This was achieved by the establishment of rigid sanitary discipline (and in justice it must be stated that the prisoners were quite easy to educate in these matters), by control of the "food-handling" personnel, and by inoculation. As regards inoculation, the supplies of British Army T.A.B. vaccine in the Middle East were inadequate for this unexpected demand, but a quantity of Italian vaccine which was captured along with other medical stores was used as follows. In the Geneifa camps, where the outbreak occurred, all prisoners who could not produce evidence of having been inoculated within two years were given two doses of 0.5 and 1 c.cm. of vaccine at ten days' interval: all others were given 0.5 c.cm. In the other camps, where only isolated cases had occurred, those who could produce evidence of having been inoculated within the previous nine months were not done, otherwise the dosage was similar.

The Summer, 1941, Outbreak

From Table I it will be seen that the incidence remained low until May, towards the end of which month cases of typhoid infection began to occur in considerable numbers. In June a major outbreak was in progress, which reached its peak in July, decreased in August, and came to an end in September. In June three cases of infection with *Bact. paratyphosum* A were identified, and in July there were more cases of this infection than of typhoid. This outbreak persisted through August and declined in September, to disappear in October. It will be noted that many cases were diagnosed on clinical grounds. The majority were treated in one hospital, and the volume of work was such that the laboratory was unable to carry out repeated tests on each case. It may be assumed, however, that the positive results obtained give a reasonable cross-section of the whole.

The cause of the outbreak need not be discussed here. A number of factors were contributory. It is probable that the infection was chiefly fly-borne, and it is of interest that no cases occurred among the staffs of the P.O.W. camps.

The prisoners at this time were, in the main, those captured in the 1940-1 campaign, who were inoculated in January. In the interval reinoculation with Italian vaccine had been carried out as it fell due. Large stocks of this vaccine had become available, and in June, when it was clear that an outbreak was imminent, all prisoners were reinoculated with a further two doses (0.5 c.cm. and 1 c.cm.) of Italian vaccine. This had little obvious effect, and in early August, when adequate supplies of British Army vaccine were received, two-dose inoculation with this preparation was again performed in the affected camps. Following on this, but not necessarily on account of it, the outbreak rapidly waned.