from the needle after removal of the stylet. On account of weak pressure in shock conditions the c.s.f. very often does not appear spontaneously and has to be drawn out by a syringe. After 1 to 2 c.cm. of the c.s.f. have been withdrawn with a syringe, 1 c.cm. of the solution of potassium phosphate, which has been warmed to body temperature, is injected with a syringe under a definite pressure, so that it penetrates into the ventricles. This method of treatment is very easy and can be applied at the front. The preparation of the potassium phosphate solution is not complicated, but must be done very carefully. The glass of the ampoules must be neutral. The solution is a mixture of the monometallic and bimetallic potassium phosphate (concentration 1/6 gramme-molecule), and can be prepared either from these salts (K_2HPO_4 and KH_2PO_4) or by adding the orthophosphoric acid to a solution of corrosive potassium up to pH 7.6.

As a rule the effect of this injection takes place in 1 to 2 minutes or even sooner (i.e., in the first place the blood pressure rises and the respiration becomes deeper). The absence of effect within a few minutes is generally due to the fact that the fluid has not reached the ventricles, as a result of the incorrect direction of the needle or of insufficient pressure. In these cases one must repeat the operation. When toxæmia is threatening—i.e., when toxic substances which form in the injured tissues enter the blood—the further formation of these substances must be stopped by excising the injured parts where possible; positive results, which are obtained by the direct action of potassium phosphate on sympathetic nervous centres, do not exclude the possibility of the appearance of toxæmic shock later on.

Conclusions

1. In the last phase of traumatic shock there is first of all a considerable fall in the tone of the sympathetic nervous system and a partial rise in the tone of the parasympathetic nervous system.
2. The most effective way of combating traumatic shock in its later phase is to raise the tone of the sympathetic centres by direct action on the vegetative centres; potassium phosphate simultaneously raises the tone of the sympathetic centres and lowers the tone of the parasympathetic.
3. By direct action on the nervous centres the ionic potassium causes an excitability of the sympathetic nervous centres, whereas the ionic phosphates, by concentrating the ionized Ca, cause a diminution of the tone of the parasympathetic nervous centres.
4. A direct introduction of potassium phosphate into the cerebrospinal canal contributes to a quicker action of this substance on the nervous centres and at the same time obviates the possibility of its opposite effect on the peripheral part of the vegetative nervous system.
5. The use of potassium phosphate as an anti-shock remedy is indicated in all those cases in which there is a diminution of the tone of the sympathetic nervous centres, such as a fall of the blood pressure, a lowering of cardiac activity and respiration, diminution of excitability, reactivity, etc.
6. Potassium phosphate must never be used in cases in which there is increased excitability of the sympathetic nervous centres, such as sometimes occurs in the first stage of shock.
7. If haemorrhage is present it must be arrested by all available means, because the considerable rise of the blood pressure through the introduction of potassium phosphate will definitely increase haemorrhage.
8. To avoid a repetition of shock it is necessary after the introduction of potassium phosphate to remove the actual cause of shock, in particular painful stimuli.
9. To ensure the direct action on the vegetative nervous centres, which are situated in the ventricles of the brain, potassium phosphate must be introduced directly into the ventricles. This is done by means of cisternal puncture. The fluid must be introduced with a definite pressure and the direction of the needle must be correct. The position of the patient must be horizontal, preferably on the left side, and the head must be lower than the body.
10. One must act quickly, without loss of time, so as to avoid a complete exhaustion of the vegetative centres.
11. The introduction of potassium phosphate does not exclude all the other measures against shock, especially blood or plasma transfusion.
12. Blood transfusion must be done in all cases where there is marked loss of blood. In other cases a blood transfusion is not absolutely necessary.

RECENT TRENDS OF SOME INFECTIOUS DISEASES

BY

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The results obtained by the introduction of new methods of treatment in certain types of infectious diseases have in hospital experience been almost dramatic. It seemed worth while to find whether any change could be shown in the number of deaths for the whole country from the numerically more important causes for which control has been attempted. The estimated saving in lives following the introduction of new methods forms an interesting speculation. The death rates cannot be used as a statistical index, since the populations at risk in 1940 and 1941 are not definitely known, so the ratio of deaths to notifications has been adopted.

Cerebrospinal Fever

The employment of chemotherapy in cerebrospinal fever has resulted in a very large decline in the fatality rate from this cause. A large increase in incidence of cerebrospinal fever occurred after the outbreak of war, an experience similar to that of 1914-18. The statistics for recent years in England and Wales are:

Year	Deaths	Notifications	Deaths per 100 Notifications
1934	729	1,080	68
1935	617	865	71
1936	635	967	66
1937	698	1,113	63
Average of 1934-7	670	1,006	67
1938	652	1,258	52
1939	517	1,500	34
1940	2,584	12,767	20
1941	2,163	11,073	20

If the average of the years 1934-7 is taken as representing the endemic level immediately before the general use of sulphapyridine, it will be seen that a great improvement has been effected. The fatality rate was halved in 1939, and in 1940 and 1941 it was less than one-third of the average value. On the basis of the average fatality rate of 66.60% during 1934-7, the expected number of deaths in the three years 1939-41 would have been 16,876. The number actually registered was 5,264, or 11,612 fewer than expected. This is probably an over-estimate, since in a period when a disease is prevalent fewer mild cases are missed and there tends to be a greater proportion of wrongly diagnosed cases than in non-epidemic periods—factors that produce a decrease in the fatality rate. The most recent pre-war epidemic occurred during 1931-3, when 5,919 notifications with 3,595 deaths were reported, giving a fatality rate of 60.74%. The expected deaths in 1939-41 on the basis of this fatality rate would be 15,392—i.e., 10,128 in excess of the observed. An objection that could be raised to this comparison is that the conditions of life were vastly different in the two periods. To obtain approximately similar conditions of life—the aggregation of large sections of the population—it is necessary to go back to the last war. During the epidemic of 1915-17 there were 5,222 deaths and 8,068 notifications, yielding a fatality rate of 64.72%. Taking this rate as a standard, the expected deaths in 1939-41 would have numbered 16,400, or 11,136 more than were recorded.

It seems reasonable to suggest that as a consequence of the discovery and adoption of treatment by sulphapyridine about 10,000 lives were saved during 1939-41.

Pneumonia

The response of cases of pneumonia, particularly lobar pneumonia, to treatment with sulphapyridine has been very successful, and large declines in hospital mortality have been

recorded. The effect of this treatment on the mortality of the whole country cannot be measured directly by means of the case-fatality rate, since we have no knowledge of the number of cases. Many factors influence the trend of the mortality from pneumonia, and consequently large fluctuations occur in the annual rates. These variations prevent a straight comparison being made between the number of deaths occurring in each year. The incidence of bronchitis has been used as a criterion to test whether the years in question were favourable or not to respiratory diseases. Unfortunately the deaths from lobar pneumonia are not available for 1940-1; the only data available are for all forms of the disease at all ages. There has been a change in the method of classification of causes of death in these years: previous to 1940 the Registrar-General gave priority to certain causes, and now he accepts the order of death stated by the medical attendant on the certificate. The deaths for 1938 and 1939 can be ascertained by both methods, and a comparison shows that the new classification slightly increases the total of pneumonia deaths and doubles those from bronchitis. The factors for reducing the totals to the old classification are 0.9466 for pneumonia and 0.5007 for bronchitis. Applying these corrections to the years 1940 and 1941, we obtain the following:

	All Forms of Pneumonia		Bronchitis	
	Deaths	Percentage of Average of 1934-7	Deaths	Percentage of Average of 1934-7
Average 1934-7	28,281	100	17,048	100
1938	25,945	92	13,273	78
1939	22,207	79	15,463	91
1940	27,636	98	23,179	136
1941	25,006	88	17,050	100

The deaths from bronchitis suggest that a particularly severe respiratory mortality was experienced in 1940. The difference between the percentage value for pneumonia and bronchitis was 12 in 1939 and 1941, but the difference of the percentages was much larger—38—in 1940. This difference of 12% might be used as an estimate of the effect of the new therapy on the mortality in 1939 and 1941, but the value for 1940—38%—would be an overstatement, since bronchitis tends to fluctuate more than pneumonia. This can be illustrated by taking the deaths for the previous 10 years and expressing them as a percentage of the mean number of deaths. The deviations then found are:

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
Pneumonia	0.4	41.9	-10.2	8.7	-4.3	-2.7	-7.3	-13.3	-8.8	-4.4
Bronchitis	11.0	58.1	-7.5	19.2	-3.7	-0.2	-19.7	-25.3	-16.6	-15.3

Although there has been an undoubted decrease in the mortality rate from pneumonia, an estimation of its extent is rather speculative. It seems probable that the deaths would have been 10% higher, and if we can accept this as a not too optimistic approximation then 7,500 lives were saved during 1939-41.

The deaths from lobar and other forms of pneumonia are differentiated in the returns for Scotland. The statistics for recent years in Scotland were:

	Lobar Pneumonia		Other Forms of Pneumonia		Bronchitis	
	Deaths	Percentage of Average of 1934-7	Deaths	Percentage of Average of 1934-7	Deaths	Percentage of Average of 1934-7
Average 1934-7	1,441	100	3,256	100	3,104	100
1938	1,188	82	2,644	81	2,462	79
1939	782	54	2,167	67	2,653	85
1940	873	61	3,367	103	4,317	139
1941	873	61	2,699	83	3,091	100

The experience of Scotland is very similar to that of England and Wales if the trend of the deaths from bronchitis is used as a standard of comparison of respiratory mortality. It is evident that there has been a reduction in mortality from pneumonia, with a very large decrease in lobar pneumonia. In 1940 the deaths from bronchitis were 39% above the mean

value, while the deaths from lobar pneumonia were 39% below the average and the deaths from other forms of pneumonia were only 3% in excess of the mean.

The reduction in the number of deaths from pneumonia was relatively greater in Scotland than in England and Wales. The mean annual number of deaths during 1939-41, expressed as a percentage of the mean of 1934-7, was for all forms of pneumonia 88% in England and Wales and 76% in Scotland, while the values for bronchitis were almost the same—109% in England and Wales and 108% in Scotland.

Puerperal Sepsis

Puerperal sepsis forms numerically the most important component of maternal mortality. In the 10 years preceding the war 40% of the total maternal deaths were attributed to this cause. The continuity of the statistics was broken in 1940 by the adoption of a new classification: beside the modification in the method of classification, described in the paragraph on pneumonia, several causes were added to puerperal sepsis. The statistics for recent years, using the 1940 mortality classification, were:

	Total Births	Puerperal Pyrexia		Puerperal Sepsis	
		No. of Notifications	Rate per 10,000 Births	No. of Deaths	Rate per 10,000 Births
1931	659,014	8,085	123	1,208	18
1932	640,443	7,567	118	1,162	18
1933	605,497	7,899	130	1,213	20
1934	622,851	8,431	135	1,350	22
1935	624,191	8,142	130	1,165	19
1936	630,337	8,267	131	1,035	16
1937	635,363	8,849	139	731	12
1938	645,933	9,307	144	682	11
1939	643,661	9,245	144	649	10
1940	629,760	7,582	120	478	8
1941	608,130	7,352	121	499	8

Since the number of cases of sepsis is unknown the best measure of the trend of the mortality is to relate the deaths to the births. Although the case rate cannot be found, the incidence of puerperal pyrexia suggests that the prevalence of sepsis at the beginning and that at the end of the period were similar, with possibly an increase in the intervening years. The above figures show that the mortality from puerperal sepsis has declined considerably and the rate during 1940-1 had decreased to less than a half of the value of a few years earlier.

Measles

A considerable decrease in mortality from measles has occurred during the past 20 years, but this disease differs from those previously discussed, as, although there has been steady progress in the control of measles, especially in the large towns, no sharp line can be drawn dividing the period into pre-treatment and post-treatment years. The number of deaths in England and Wales in two-year periods, to eliminate the fluctuations in the annual deaths due to the periodicity of measles, were:

Period	Deaths	Period	Deaths
1922-3	11,010	1932-3	5,348
1924-5	10,171	1934-5	5,114
1926-7	7,205	1936-7	3,802
1928-9	7,690	1938-9	1,942
1930-1	7,476	1940-1	2,129

Although the character of the attack and the severity of the accompanying complications vary from epidemic to epidemic there has been an almost progressive decline in the number of deaths. Serum prophylactics have been employed during the past decade, and special therapeutic measures—e.g., oxygen therapy—have probably influenced the trend of mortality. Other important contributing factors were the improved standards of nutrition and hygienic conditions and, in London, a greater proportion of admissions to hospital. A lowering of the virulence of the causative organism may also have had an effect. It is impossible to assess the relative importance of these various causes of the decline in mortality.

A comparison of case fatalities cannot be made, since measles has been notifiable only since the start of the war.

The population at ages 0-15 has fallen by almost one-fifth during the past 20 years, and this must be taken into account when estimating the change in mortality. If the deaths are related to the average population aged 0-15 in 1922-5 and this factor is applied to the estimated population at 0-15 in 1940-1 (obtained by extrapolating a straight line fitted to the population at 0-15 of 1935-9) the resulting expected deaths for 1940-1 would be 8,722—i.e., 6,593 in excess of those observed.

We may conclude that the sum of the various factors operating towards a decline has resulted in a reduction of childhood mortality from measles of about three-quarters of what it was 20 years ago.

REDUCTION OF OLD-STANDING DISLOCATION OF THE KNEE-JOINT

BY

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There are two main indications for attempting reduction of a long-standing dislocation of the knee-joint: first, to relieve pain; secondly, to overcome shortening as a preliminary to an arthrodesis, or excision of the joint. Forcible manipulation for such cases is usually contraindicated, and wedge plasters are obviously ineffective. The case here described was treated by the method devised by Hamilton Russell (1924) for the treatment of fractures of the shaft of the femur. This was slightly modified, skeletal traction being used instead of strapping extension.

Case Report

History.—A man aged 56 had suffered from rheumatoid arthritis "for years." He had been confined to bed for over two years and, according to his doctor, the duration of the dislocation was about 18 months. On examination the right knee was obviously dislocated. It was flexed to 140 degrees, with the leg externally rotated through 50 degrees (Fig. 1). Under an anaesthetic there were about 10 degrees of movement present.

Treatment.—The hip was placed on an adjustable Braun splint, so that traction could be exerted in the line of the deformity (Fig. 2). Skeletal traction was applied through the os calcis. This was used instead of strapping so that the

FIG. 1.—Note the clear view of the tibio-fibular joint due to the marked external rotation of the tibia.

external rotation could be controlled. A sling was passed under the knee and attached to a cord which passed over a pulley (a) on a Balkan beam. Thence it was continued to another pulley (b) on the vertical limb of the Balkan beam at the level of the leg. A third pulley was fixed to the Böhler stirrup on the os calcis nail (c), and a fourth (d) tied to the upright just below b. The cord was then threaded over these and finally attached to a weight of 7 lb. The foot of the bed was elevated.

A cord was fixed from the outer side of the nail to a weight suspended by a pulley (e) on the horizontal limb of the Balkan beam to control external rotation.

Three weeks later a radiograph was taken, and it showed that the dislocation had been reduced (Fig. 3). During this

FIG. 2.—The traction under the knee pulls the head of the tibia forwards. The cord attached to the nail and passing over the pulley (e) helps to rectify the external rotation. The adjustable splint has been flexed to fit the contracted knee.

FIG. 3.—The dislocation has been reduced.

FIG. 4.—The external rotation has been corrected and the splint has been lowered so that the knee is almost straight.

time the patient did not complain of any undue discomfort. As the knee was on the adjustable type of Braun splint (Fig. 4), it was possible to lower its horizontal position and thus gradually to extend the knee. By doing this and altering the line of pull accordingly, the limb could be straightened completely. This took approximately 7 weeks.

Summary

A simple method of reducing an old dislocation of the knee-joint is described. The ease with which the reduction was achieved makes it possible that this case was exceptional; but the simplicity of the manoeuvre would seem to warrant a trial in such cases.

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