gested that Queen Charlotte's, through its ante-natal clinic, should carry out experiments on the bearing of nutrition on safe maternity. It was mentioned by Mr. H. B. STOKES, secretary-superintendent of the hospital, that a certain number of anaesthetic machines of the Minnitt type, but incorporating improvements by Mr. Rivett, and known as the "Queen Charlotte's model," had been distributed to the districts, and were being used by midwives with great success.

THE BOURNEMOUTH TYPHOID OUTBREAK

JUDGE COTES-PREEDY'S REPORT

The following is the report by His Honour Judge D. Cotes-Preedy, K.C., M.A., LL.M., L.S.A., on the epidemic of typhoid fever in Bournemouth and neighbourhood in the late summer of 1936. We have inserted cross-headings.

Nature of the Inquiry

At the joint invitation of the boroughs of Bournemouth, Poole, and Christchurch, and the Anti-Typhoid League, I undertook to hold an inquiry into certain allegations, criticisms, and demands of the League in connexion with the outbreak of typhoid fever which occurred in the said boroughs during August and September last.

I sat at the Town Hall, Bournemouth, on February 3, 4, 5, 12, and 13, and at the conclusion of the inquiry reserved my determination of the matter. I would point out that in no sense did the inquiry proceed on formal or legal lines, and by general consent I did not strictly enforce the rules of evidence. The extensive latitude allowed to the spokesmen on behalf of the League and the disclosure of all material facts requested by me from the officials of the boroughs will, I trust, reassure all interested and concerned that the inquiry was exhaustive.

Previous to the sittings the Anti-Typhoid League formulated in writing certain allegations and demands, and to these the three councils replied in writing. It was mutually agreed between the contending parties that the sittings should be held *in camera*, and with this decision I agreed. In consequence I feel I am able to set forth the view I have formed in a manner conducive to brevity and without detailed examination of the evidential value of the information laid before me. I trust this course will be less likely to cause distress or annoyance to any concerned or in any way inflame any sores caused by the public agitation before the inquiry was decided upon.

At the outset I would like to make it clear that it was no part of my duty to decide as to the source of the typhoid fever outbreak—this doubtless will be amply dealt with by the Ministry of Health in its forthcoming report. But the inquiry proceeded on the assumption that the source of the trouble was to be found in milk supplied by a certain dairy.

The Allegations

Mr. S. H. Wall, chief spokesman on behalf of the Anti-Typhoid League, and who discharged a difficult task with ability, insisted that the League had not come forward to emphasize private grievances. It did not seek to blame individuals, but rather to condemn regulations under which the latter acted, which it contended had caused the uneasiness that existed. The "vital allegations," said the speaker, relied upon by the League were that the councils, having ascertained that there were cases of typhoid in their area, had failed in their duty

- (i) by not announcing the fact in a clear and unequivocal manner in the Press;
- (ii) by not distributing notices from house to house setting forth the usual symptoms of such disease, and at the same time giving advice as to prophylactic measures, and
- (iii) by endeavouring to conceal from the public the true facts about the outbreak.

Other allegations described as "important" were

- (iv) that the councils should have left in their homes all patients for the care and isolation of whom reasonable facilities existed in their own houses in order to be able to remove immediately to isolation hospitals patients for the care and isolation of whom no reasonable facilities existed in their own homes, and that in consequence certain patients for whom no facilities existed in their homes were unable to obtain immediate admission to isolation hospitals or were compelled to undergo long journeys to isolation hospitals in other areas,
- (v) that improper pressure was brought to bear on persons with facilities at home to induce them or persons in their charge to be removed to isolation hospitals, and
- (vi) that orders under the provisions of the Public Health Act, 1875, were obtained, or sought to be obtained, without the necessary conditions precedent to the granting of such orders being fulfilled.

Though not set forth in the "allegations and demands," Mr. Wall, in the course of his speech, alleged that the councils had concealed the true facts of the outbreak in deference to the desire of the majority of people who were financially interested in the district. He added that he did not suggest any deliberate plot by anybody in particular, but described the situation as that "of an atmosphere which was created to save the towns' revenue."

Early in the inquiry it was clear that the allegations had little or no relation to the borough of Christchurch, and I was able to release the officials of that borough from participation in the inquiry.

Questions of Responsibility

In the first place it should be borne in mind that from the onset of the outbreak the responsible officials of the boroughs had the assistance and guidance of the Ministry of Health in the person of the late Dr. Shaw, the well-known epidemiological expert, whose recent death is greatly to be deplored. I am satisfied that his views and advice were accepted and acted upon by the local officials, although they admitted their responsibility for any orders or directions that were given.

Secondly, I would point out that it was established that the symptoms of paratyphoid and typhoid are extremely difficult to differentiate in the early days of the disease, while in addition there are certain ailments of a less serious import, such as food poisoning, which are liable to occur during the summer and autumn months and present similar symptoms at the outset.

Again, it is important to realize that the laboratory tests for paratyphoid and typhoid do not produce immediate results leading to certainty. Though perhaps of little importance, it appears that "paratyphoid" and "typhoid" are classed together under "enteric fever" in the returns of the Registrar-General, which may tend to confuse the minds of the uninitiated.

Dealing with the allegations (i), (ii), and (iii), it is common knowledge that sporadic cases of typhoid fever frequently occur all over this country, and in my view the officials of the boroughs would have acted unwisely if, directly cases of illness suspected to be paratyphoid or perhaps typhoid had appeared, they had sponsored an alarmist Press announcement of an existing typhoid epidemic. Moreover, the difficulty of diagnosis did call for caution, and had such a pronouncement been made before the precise nature and source of the disease had been determined a hasty flight of people away from the district carrying the disease to all parts of the country might have occurred, and thereby prevented the localization of the trouble. In my opinion the contention that notices should have been distributed to every house setting forth the symptoms of the disease, with the further information as to prophylactic measures, is not well founded, as by such a course public alarm would have been unnecessarily aroused.

In my view once the situation was established there was no endeavour on the part of the authorities to conceal the true facts about it.

Nursing in Hospital or at Home

If the charges (iv) and (v) had been in any degree supported by reliable evidence they would possibly have called for serious consideration, but in my opinion there was no evidence given tending to establish such allegations. The fullest information was afforded to me showing that the sudden and serious difficulty of accommodating a large number of patients was tackled with great efficiency by the medical officers and the Health Committees.

Under the advice of the Ministry of Health's representative isolation of patients in hospital was urged, and in my opinion rightly so. Naturally one is able to understand and sympathize with the feelings of anxious relatives for the patient's own home to be used, but from a public welfare point of view there seems to be no doubt isolation in a hospital under strict and careful supervision is the more desirable course. It is not without interest in this connexion to note that the evidence showed that in Poole, out of 197 cases treated in hospital twelve died, and that of thirteen cases nursed in their own homes five died. But I do not suggest any certain deduction can be drawn from these figures.

In one case in Poole it appeared that the medical officers strongly urged upon those in charge to allow the patient to be removed, which was strongly resented, and that an application for a magistrate's order ordering the removal was unsuccessfully made. Apart from this case, which in my view did not exhibit "undue pressure," no reliable testimony was forthcoming showing that such pressure had been exerted over relatives or patients themselves. From several witnesses I received favourable accounts of their treatment while in hospital.

Vindication of Officials

On reflection I feel sure that the members of the Anti-Typhoid League will share my regret that the charge was ever put forward alleging that the true facts concerning the outbreak were concealed owing to the financial interest which the majority of the inhabitants had. There was not a scintilla of evidence put forward to support such a serious allegation. Moreover, I am confident no one could believe that officials responsible for the health of the community would lend themselves to such a proceeding. There were other criticisms made by the League, but they were of a minor character and do not call for serious consideration.

I have no hesitation in saying that the inhabitants of the three boroughs should realize that Dr. C. F. Pedley, deputy medical officer of health for Bournemouth, Dr. R. J. Maule Horne, medical officer of health for Poole, Dr. Walter Astén, chairman of the Bournemouth Health Committee, and the other officials of the boroughs grappled with a sudden and serious situation with efficient vigour and a keen appreciation of the proper steps to take in order to deal with the emergency that faced them. They deserve the confidence of their fellow citizens.

In conclusion I would like to emphasize the fact that all who took part in the inquiry evinced an earnest desire to sift thoroughly all the matters in question and with the ultimate benefit of the three boroughs in mind. This heartens me to believe that any bitterness engendered before the hearing may have been permanently dispelled. I must thank all those who addressed me, and others who gave me their kind assistance during the inquiry.

D. COTES-PREEDY.

April 4, 1937.

In Belgrade there is one doctor to every 300 inhabitants. There is a total of 789 male and 171 female practitioners. The economic conditions under these circumstances are very unfavourable, and are believed to account for the high mortality in the medical profession, especially among the younger doctors.

Reports of Societies

ACTIVE IMMUNIZATION AGAINST DIPHTHERIA

At a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on April 9, with Surgeon Rear-Admiral S. F. DUDLEY in the chair, a lecture was given by Dr. CLAUS JENSEN, director of the department of biological standards, State Serum Institute, Copenhagen, on active immunization against diphtheria, with special reference to a combined subcutaneous and intranasal method.

Dr. Jensen said that it was with diffidence he spoke to an English audience on a subject on which so much excellent work had been done in this country, especially under the aegis of the Medical Research Council. In Denmark the actual number of individuals inoculated against diphtheria was relatively small, owing partly to the fact that the number of cases of diphtheria had been low for some years, with no real epidemics, and also to the unwillingness of the authorities of the State Serum Institute to endorse propaganda for mass immunization until a thoroughly efficient and convenient method was available. In some countries the three-injection method of Ramon had been tried, but for mass immunization it had several drawbacks. From the point of view of practical administration it was desirable to obtain a diphtheria antigen of such marked immunizing power that a single injection would confer a sufficient degree of immunity without causing undue local or general reactions. Much work had been done in recent years towards making effective, easy, and cheap this ideal of the public health administrator.

In Denmark the preparation chosen was purified toxoid with aluminium hydroxide. The toxoid used was a diphtheria toxin detoxicated by formaldehyde and heat, and put through a thorough process of purification, which removed most of the unspecific, more or less decomposed proteins, salts, and other substances present in the crude toxoid. Before distribution the purified diphtheria toxoid was mixed with a sterile suspension of aluminium hydroxide. For details as to the properties of this substance he referred his audience to the work of Schmidt and Hansen (1933, *Acta path. et microbiol. Scandinav.*, Supp. 16.). For active immunization by a single subcutaneous injection from 1 to 1.5 c.cm. of this preparation, equal to 35 to 50 flocculation units of the purified toxoid, stimulated antitoxin production in 96 to 98 per cent. of cases. In children below 7 years of age the injection of antigen seldom caused reactions. In 82 per cent. there was no reaction, in 11 per cent. a very slight local reaction, and in 7 per cent. moderate to strong local reactions, or possibly some fever. Older children showed more often a mild local reaction within the first twenty-four hours after the injection, appearing as a little swelling and redness at the site, or sometimes a stronger local reaction accompanied by a moderate rise of temperature. In adults such reactions were to be expected more often, but they lasted as a rule only for a day or two, and no serious condition resulted. The antitoxin production might begin three to four days after the injection of antigen, and as early as two weeks afterwards immunity might be well developed. From experience so far gained it appeared as if the immunity to diphtheria acquired by the use of this antigen preparation lasted for a considerable time. The effect of increasing the dose up to as much as 400 flocculation units had been studied, but no significant increase in response was found. Doses smaller than 35 units had not been tried.

Intranasal Instillations

Attempts to improve the effect of the single-injection method by increasing the dose given had not been very