medical service. Details could also be supplied to the various Joint Industrial Councils throughout the country with regard to the trade or industry covered, and both sides would be compelled to discuss the difficulties existing; we should then get co-operation between the lay and medical mind in the promulgation of remedies.

Conclusion

The trade unions of this country, whilst asking for the most efficient medical service, are more concerned with prevention than with cure. It has been a great struggle for us to secure facts and data, and I do suggest to the great medical fraternity that individualism has been one of your greatest handicaps. Can you not concentrate your efforts and co-operate with us? If this is possible I am sure that industries will not limit their consideration to wages and hours alone. When discussing conditions of employment they will have before them a new basis upon which to work, resulting in general provisions for dealing with health problems being incorporated in the industrial structure.

As I said at the outset, our chief concern is to maintain what is, in fact, the capital value of our members, with ability to enjoy good health, preserve a high standard at home, rear strong and healthy families, and avoid the waste and loss of illness.

I appeal to the great medical service and to my own people to set aside all prejudices of personal outlook and make one great combined effort to establish a really correlated service that will remove one of the blots from our civilization.

THE USE OF ADULT SERUM IN MEASLES AN ACCOUNT OF AN EPIDEMIC IN A PUBLIC SCHOOL

BY

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The following report of an epidemic of measles in a public school of three hundred boys with an age group of 13 to 18 years in which treatment by adult serum was used will be of special interest to all medical officers of schools as well as to doctors in general practice.

The school having escaped an epidemic of measles for several years the risk had been steadily increasing, and on January 15 we started the term with ninety-nine boys at risk of measles. On the 17th a boy was admitted to the sanatorium with a high temperature, and the next day he showed the typical rash of measles. The case was not severe: on the fourth day the patient's temperature was normal, and on the twelfth he was able to go home for a few days' convalescence.

Meanwhile the school had been infected, and the question of using adult serum in the hope of attenuating the disease in consequent cases was considered. The head master gave enthusiastic support to the suggestion, and steps were at once taken to obtain a supply of serum. Through the good offices of Dr. E. H. T. Nash of Hounslow we were put in touch with Drs. O'Brien and Parrish of the Wellcome Research Laboratory, by whom we were supplied with 100 doses of 10 c.cm. each. To replace the stock we undertook to return the equivalent in blood from selected adults. Members of the teaching staff readily volunteered for this purpose. The next step was to circularize parents and obtain permission to use

serum. Consent was in the main readily given, but fifteen refusals were received. This number made a useful group of controls.

The most difficult point of all now arose—namely, to whom to give the serum and how soon? Supposing we were lucky enough to have escaped widespread infection and had meanwhile given serum to all at risk, we should very much have compromised our position in dealing with a future epidemic on the same lines. In the first instance, therefore, we decided to give serum only to those boys who showed a rise of temperature, or were +++ risks—a plus standing for dormitory, house, or form contact. The temperature of each boy who had not had measles was recorded daily. It was recognized, of course, that serum used in any but the earliest stage of incubation was probably of little use; but as it could do no harm and experience had not yet crystallized on this point, it was decided to proceed on these lines.

The course of events very soon clarified the position, and a fortnight later cases began to come in so freely that on February 14 serum was given to all who were susceptible. In the end seventy of the eighty-five cases were so treated. The object of this report is to be as helpful as possible to the head masters and medical officers of boarding schools, and in weighing the conclusions here arrived at it is important to bear in mind the following points:

1. That this is the first occasion on which the treatment has been used in a public school, and we were without experience to guide us.
2. That though the number of cases was large for a school, it is small for statistical purposes.
3. That the writer has had experience of at least three equally large epidemics at the same school under similar conditions.
4. That it is not always easy to give proof of clinical impressions even where those impressions are well marked.

The most important conclusion is that the serum proved all the help that we anticipated, and more. The attenuation of the disease was remarkable, and we shall certainly use the method in future. The load of anxiety a school medical officer has to carry during an epidemic of this nature must be experienced to be understood. With this adjunct to his armour of defence the doctor is materially relieved of that load.

Results

The examination of the records of the cases for statistical purposes supports the general conclusion arrived at very definitely, but the impression from clinical observation was even stronger.

The cases fall into three groups:

1. *Serum Not Given* (15 Cases).—This group includes the original case and one boy who was reported to have had measles as a child. The average period of pyrexia for these cases (excluding complication cases) was 8.2 days. The complications that occurred were one extremely severe case of bronchopneumonia (in oxygen tent fourteen days), and two cases of middle-ear inflammation necessitating paracentesis.

2. *Serum Given During Incubation* (20 Cases).—The average pyrexial period was 6.5 days. The complications were four cases of middle-ear inflammation necessitating paracentesis. Of these one was inoculated thirty-six hours only before the rash appeared, and should really rank with Group 1 as a complication. The remainder were injected ten, twelve, and thirteen days before the rash appeared.

3. *Serum Given Before Infection* (50 Cases).—The average period of pyrexia was 5.2 days. There were no complications.

The freedom from complications in the whole series is remarkable, although the epidemic did not appear to have been one of a milder type than usual, as indicated by the cases which were not inoculated.

Observations of Attenuation

The following conditions were observed to be attendant on the use of the serum:

1. Lower temperature, fewer constitutional disturbances, quicker recovery.
2. The rash is noticeably different. It is much more discrete, rather more ham- or copper-coloured. It persists a long time on the face and is not so profuse or well marked on the trunk and limbs.
3. There was at first a suspicion that the incubation period is delayed; the rash appeared slow to come out, even for measles. This suspicion was not borne out by subsequent observations. We had, in fact, been prepared to accept the view that the serum conferred some degree of immunity when used before infection. The steady curve of the incidence graph does not support this. The inoculation of fifty boys on the same date might be expected to produce a definite flattening of the incidence curve if temporary immunity was a result of inoculation.

The real problem in aiming at attenuation in this type of school is to select the right moment to give the serum. The ideal from the treatment point of view would be the certain infection of the largest number from the first case. In a preparatory boarding school it would probably be wise to use serum without delay.

There is no reaction to the injection. It is well to give it before bedtime. There is some stiffness locally some four hours after injection, and a few boys were allowed to stay in bed for breakfast. Two patients had chicken-pox concurrently with measles.

In all cases with ear symptoms of deafness, discomfort, or pyrexia the drum is incised as soon as any bulging is observed. If the fluid evacuated has passed the serous stage we are disappointed at not having been earlier in intervention. The importance of the early treatment of middle-ear inflammation is not sufficiently insisted upon in the standard works on medicine used by medical students. It is worth recording in this connexion that in fifteen years' experience of measles epidemics in this school we have never had a case of mastoid infection requiring operation.

Conclusions

The use of adult serum has a marked effect in attenuating the disease and in decreasing the incidence of complications.

In the epidemic here recorded there was no evidence of temporary immunity resulting from the use of the serum. Early treatment of middle-ear infection by incision of the drum will greatly reduce the risk of mastoid infection.

The *Transactions of the Twenty-third Annual Conference of the National Association for the Prevention of Tuberculosis*, which was held last July in Bristol, have now been published from Tavistock House North, Tavistock Square, London, W.C.1, as a paper-covered volume of nearly 200 pages (price to booksellers, 6s. 9d.; sold privately at 7s. 6d.). The main subjects discussed were propaganda and publicity methods, preventive institutions, with special reference to open-air schools, and the equipment and activities of a tuberculosis dispensary.

THE VALUE OF CONTINUOUS NEGATIVE PRESSURE IN SURGERY

BY

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The use of suction to remove blood, pus, and other exudates in throat, abdominal, and neurological surgery is now well established. Through a bronchoscope or oesophagoscope no other method would be possible; in brain surgery it is essential to keep a bloodless operative field with the minimum of trauma to the tissues. For such purposes suction pumps are required which will remove a large quantity of fluid quickly, while the amount of noise such a pump produces is of minor importance because it is only used in an operating theatre for relatively short periods. There are many excellent pumps for these purposes which work by pedal, electric, and water power.

Suprapubic Drainage

Although the Harris operation is accepted as an advance in suprapubic prostatectomy, an attempt at the immediate closure of the bladder is advocated by only a small proportion of surgeons owing to the risk of reactionary haemorrhage and the difficult and constant after-treatment necessary. The large-calibre indwelling catheter required is very liable to give rise to a severe urethritis, which later may lead to stricture formation. Suprapubic drainage is regarded as much safer, especially in the hands of the majority of surgeons. Can, therefore, the disadvantages of suprapubic drainage be removed? There are roughly two ways of treating a suprapubic cystotomy. The urine can overflow through and around a tube, to be collected by a suprapubic box. The main advantage of this method is that the apparatus is so simple, but the disadvantages are many. Macalpine (1932) pointed out that overflow drainage of the bladder predisposes to perivesical extravasation, which contributes to toxæmia in a patient whose excretory function is usually already damaged. He has shown that post-operative uræmia and sloughing of the wound are often the result of overflow drainage of the bladder: "the fundamental fault is the saturation of the perivesical structures before any of it arrives on the surface of the abdomen." He supported his assertions by experimental and clinical evidence, and also by the marked improvement in his results since he used suction drainage. Although suprapubic wounds frequently heal well without the use of suction, especially in private patients in good condition, I have also been convinced of the improvement in the morbidity and mortality resulting from the use of suction suprapubic drainage. I have based my opinion on a number of cases at the Liverpool Royal Infirmary and other cases treated elsewhere during the last three years. Furthermore, if a suprapubic box is used early it has to be applied with firm pressure in order to prevent leakage; such pressure causes much pain in a recent wound, which becomes oedematous and gaping, thus also predisposing to infection and violating Hilton's principle of rest to a healing wound. The other alternative of allowing the urine to soak into repeated large dressings and the bed is an "incomparable disgrace to modern surgery."

Problem of Suprapubic Suction Drainage

Even in 1914 Chetwood described an electric suction pump operated by a 1/12 horse-power motor; this apparatus