Embolism of the retina is not a very rare misfortune, and, by the unvarying law of chance, a certain percentage of cases end later by Bright's disease. Examination of a number of these might throw light on the etiology of monocular retinitis.

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THE ANTIGEN TREATMENT OF PNEUMONIA IN INFANCY AND CHILDHOOD.

BY

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ECTO-ANTIGENS or immunogens have recently been introduced into biological therapy; the theoretical basis and experimental work on which their manufacture is based have been described by Sir Thomas Horder,¹ and by Ferry and Fisher.^{2,3} This type of vaccine is probably less toxic than the older types, so permitting much larger quantities of the specific antigen to be administered without deleterious effects. In the autumn of 1926 I began using immunogen as a routine treatment in all cases of pneumonia and bronchopneumonia, and have compared the results obtained with those of the previous nine months.

All the patients were under 14 years of age, many of the infants suffered to some degree from rickets, a few from severe malnutrition, and in a few the pneumonia was terminal or complicated by severe enteritis. Cases of lobar pneumonia and bronchopneumonia are included, the majority being of the latter type. I have attempted to keep the standard of diagnosis uniform; all patients who showed evidence of pulmonary consolidation and symptoms of toxæmia were diagnosed as cases of lobar pneumonia or broncho-pneumonia, even though the disease was of brief duration. Some of these cases would doubtless have been regarded by others as capillary bronchitis or pulmonary congestion.

It is difficult to estimate the value of any specific therapy in the pneumonias of childhood. In the present series of cases some of the patients who had been ill only a few days, and who on admission showed signs and symptoms of bronchopneumonia, recovered in a few days after one injection of immunogen; but others with similar histories, signs, and symptoms recovered as rapidly without it. The combined pneumococcus immunogen of Parke, Davis and Co. was used; it is an extract of types 1, 2, and 3 of the *Diplococcus pneumoniae* together with an extract of haemolytic and non-haemolytic streptococci. Immunogen was injected as soon as a patient was admitted or as soon as the disease was diagnosed in a patient already in hospital. The dose varied from an initial injection of 5 minims in infants to 10 minims in older children. The injections were usually repeated on alternate days in increasing doses; six injections was the maximum number given in any one case; all were given subcutaneously by nurses; in no case did an abscess form, nor were any ill effects noticed.

From December, 1925, to September, 1926, fifty-five cases of lobar pneumonia and bronchopneumonia were treated without immunogen. From September, 1926, to February, 1927, fifty-six cases were given immunogen, but otherwise were treated in a manner similar to the earlier group.

Cases Treated without Immunogen.

Age.	No. of Cases.	Recovered.		Died.	
		Cases.	Per Cent.	Cases.	Per Cent.
Under 2 years ...	18	7	38.8	11	61.2
Over 2 years ...	37	30	81.0	7	19.0
Totals ...	55	37	67.2	18	32.7

Cases Treated with Immunogen.

Age.	No. of Cases.	Recovered.		Died.	
		Cases.	Per Cent.	Cases.	Per Cent.
Under 2 years ...	15	10	62.5	6	37.5
Over 2 years ...	40	40	100.0	0	—
Totals ...	56	50	89.3	6	10.7

The favourable results in the group of cases treated with immunogen were so marked that the records were examined again and cases in which the pneumonia was a terminal condition or had been complicated by some other disease were excluded; but the resulting figures were even more strongly in favour of immunogen, for three of the deaths occurring in infants under 2 years of age who had been treated with immunogen occurred respectively in a marasmic infant, in an infant already moribund at the time of injection, and in an infant who recovered from the pneumonia but who died a few days later from enteritis.

The number of cases is too small to warrant any dogmatic statement, but it would seem that the immunogen had a favourable effect; the duration of the disease did not appear to be shortened, but the mortality rate was reduced.

I wish to thank Lieut.-Colonel P. Macdiarmid, O.B.E., M.D., the medical superintendent of Alder Hey Hospital, for permitting me to publish this note.

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ZINC IONIZATION IN THE TREATMENT OF SUPPURATIVE OTITIS MEDIA.

BY

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THE results of the treatment by ionization of chronic suppurative otitis media at Alder Hey Children's Hospital have been so successful that it has been adopted as a routine. Over 300 children have been treated in two years, and nearly all these have been discharged. They ranged in age from 1 to 16 years. In some there was a history of long-standing otorrhoea, and in others the condition developed whilst the patient was in hospital, frequently as a sequel to bronchopneumonia. Otitis is a frequent complication of pneumonia in infants, and explains the cerebral symptoms observed in many cases.

On the occasion of first attendance at the ear clinic a thorough examination is made in order to find out the exact conditions present, with a view to establishing the cause of the chronicity, and Friel's method of classification is followed.

Where otorrhoea is combined with infection of the nose and throat, these complications are first dealt with; if granulations are present an attempt is made to destroy them by electrolysis; if, on the other hand, the case is one of simple tympanic sepsis zinc ionization is instituted.

Method of Treatment.

The object of ionization is to render the tympanic cavity sterile, the method adopted being the passage of an electric current through a solution of zinc, utilizing the coagulation.

power of zinc. The technique followed is that described by Friel, and scrupulous attention to detail is absolutely necessary.

In order to ensure that the zinc solution comes into immediate contact with the infected walls of the cavity the ear must be thoroughly cleansed, and this is best done by syringing twice daily for a week with a solution of equal parts of potassium chloride, sodium bicarbonate, sodium chloride, and borax. At the end of this period the ear is syringed with sterile water, anaesthetized by a solution of cocaine, as recommended by Dr. F. P. M. Clarke (*BRITISH MEDICAL JOURNAL*, November 20th, 1926, p. 938), and the ionization proceeded with.

The tympanic cavity is filled with the solution zinc sulphate (2 per cent.) and a zinc electrode placed in the meatus and connected to the positive pole. The negative electrode is placed on the leg over a pad of lint soaked in saline. A continuous current, very gradually increased to 3 milliamperes as gauged by the galvanometer, is passed through and controlled by a rheostat.

The average length of treatment is from ten to fifteen minutes, at the end of which period the current is very slowly decreased to zero. The ear is then carefully dried and a little boric powder insufflated.

Applications of the Treatment.

In the treatment of granulations a bipolar electrode composed of zinc is applied directly to them and the current, as described above, passed through. For attic sepsis the cavity is thoroughly syringed, filled with the standard zinc solution, a fine zinc wire electrode is introduced through the perforated tympanic membrane into the attic, and the current passed.

Conclusions.

Zinc ionization has given excellent results, as will be seen from the following table.

Results of Treatment of Chronic Suppurative Otitis Media by Zinc Ionization.

Causes of Suppuration.	Total.	Cured.	Left Hospital.	Referred for Operation.	Still under Treatment.
Tympanic conditions solely:					
(a) Tympanic sepsis	154	132	15		7
(b) Tympanic sepsis + granulations	51	36	3		12
(c) Tympanic sepsis + polypus	5	1	2		2
(d) Tympanic sepsis + caries	4	2			2
Tympanic conditions combined with:					
(a) Tonsils and adenoids	44	41	1	38	2
(b) Nasal conditions	15	12		1	3
Tympanic conditions combined with:					
(a) Attic disease	7	2	2		3
(b) Mastoid disease—					
Previous operation in hospital	12	8			4
Previous operation before admission	14	12	1		1
Tympanic conditions combined with:					
(a) External otitis	11	11			
(b) Stricture of meatus	1	1			
Totals	318	258	24	39	36

In cases treated soon after onset and showing no complications one ionization has generally been followed by cure. If, however, the discharge persists after one or two treatments, complications must be sought for. It has been noticed that after ionization a much more effective view of the parts can frequently be obtained, as their turgidity is diminished.

It is useless to advocate zinc ionization as a cure-all, and it is equally futile to ionize a tympanic cavity if septic foci are left in the nose, mouth, or throat; in the presence of disease of the mastoid, ionization is of little service except as a post-operative measure.

The number I have classified as cured (as judged by the complete cessation of the discharge from the ear) may appear somewhat larger than the figures quoted by some other workers, but it is influenced by the fact that all patients are

treated as in-patients, and are, consequently, under the best conditions for the prevention of any reinfection.

Careful records of each case are taken, and every endeavour is made to keep in touch with discharged children. Seven have been readmitted with a recurrence of the ear condition, but in each of these it has been evident that after-care has been insufficient.

The best results have been obtained in those cases which have developed otorrhoea whilst in hospital, so that treatment could be commenced within a few days of the onset of the discharge. This would seem to suggest that ionization might be of service in fever hospitals for patients suffering from post-scarlatinal middle-ear infection.

I am indebted to the medical superintendent of Alder Hey Hospital (Dr. P. Macdiarmid) for permission to make use of the statistics obtained in the hospital.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A PAROXYSM OF AURICULAR FIBRILLATION CAUSED BY ELECTRIC SHOCK.

THE paper by Professor John Hay and Dr. Wallace Jones on "Trauma as a cause of auricular fibrillation," published in the *JOURNAL* of March 26th (p. 559), prompts me to put on record the following case.

A man, aged 35, came to consult me in the evening of November 14th, 1926. He stated that during that afternoon, while working in a tunnel, he took hold of a large portable electric lamp which had been temporarily connected with the switch of a motor. He immediately received a shock and was unable to release his hold of the lamp. When the current was cut off by one of his fellow workmen he fell backwards, but did not apparently lose consciousness. He felt dazed and was conscious of a strange fluttering sensation in his chest. After a rest, however, he was able to resume his job and continued at work for the rest of the afternoon.

He walked about a mile and a half to my house, and when I saw him he was not obviously distressed though he complained of feeling shaken, and still felt the fluttering in his chest. There was a small burn on the right thumb. The pulse was quick and irregular, and a polygraph curve showed a ventricular venous pulse with a radial rate of about 118 per minute. Certain parts of the radial curve showed a tendency to a regular recurrence of the irregular beats, which could be spaced, in the manner shown by Lewis, to occur in the irregular pulse which is sometimes associated with auricular flutter. It is possible, therefore, that this was a paroxysm of auricular flutter rather than fibrillation.

Twenty-grain doses of potassium bromide were prescribed and he was advised to go home and stay in bed. When he was seen next morning the pulse was regular and a polygraph curve showed that sinus rhythm was restored at a rate of 66 per minute. No disease of the heart could be detected. The apex beat was in the normal position and the sounds were free from murmur.

I have known this man for many years. He has never had rheumatism. Like at least two others of his family, he has suffered for many years from partial deafness associated with nasal obstruction, but apart from this he enjoys good health.

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Hull.

RUPTURE OF THE RECTUS ABDOMINIS MUSCLE.

IN the *JOURNAL* for April 30th Mr. P. J. Moir and Mr. C. R. McCash describe interesting cases of rupture of the rectus abdominis muscle occurring in healthy persons during severe physical effort. The following case furnishes still another example, and may also be of some interest.

On July 22nd, 1917, an ambulance attendant was, with one assistant, carrying a very heavy patient on a stretcher up a difficult staircase in a nursing home, when he felt a tearing pain in the right side of his abdomen. He struggled through his work during the next two days, but was then forced by increasing discomfort to enter the Glasgow Western Infirmary.

Examination revealed a slight swelling over the right rectus muscle, and this area was exquisitely tender. There was no ecchymosis. On operating I found that the sheath of the right rectus was intact, but on opening this I saw at once that the muscle, except at its medial and lateral borders, was torn across. The gap between the retracted torn fibres was filled with blood clot. The level of the injury was about two inches below the umbilicus. Muscle and sheath were sutured, and the wound closed.

The patient has been at work continuously since his dismissal from hospital.

Glasgow.

CHARLES BENNETT, M.B.