undiluted intrathecally and intravenously in all four cases, two of which developed a well-marked serum reaction on the tenth day.

From the hospital records as far back as 1928 there appear to have been only six proven cases of meningococcal meningitis, of which five were treated with anti-meningococcal serum. All the cases ended fatally, the longest survival period being sixteen days. It is our impression that the use of antitoxin exerts a favourable influence on the prognosis of meningococcal meningitis, and that administration by the intravenous route is the most advantageous.

Case I

A girl, aged 13, developed generalized headache and persistent pain in the neck which was becoming gradually worse, and was admitted to hospital on the eighth day. She then presented a typical picture of meningitis, with very marked head retraction. The temperature was 104° F. and the pulse 100. The cerebro-spinal fluid was under greatly increased pressure and milky in appearance, containing 2,990 cells per c.mm., all of which were neutrophil; and from a later specimen meningococci were obtained. Daily lumbar puncture was performed under light ether anaesthesia, as it was found that this gave a rather better flow of cerebro-spinal fluid; moreover, the child preferred it to local anaesthesia. Antitoxin was given, 30 c.cm. intrathecally on the first day, and 90 c.cm. on the sixth day, followed by 110 c.cm. on the next three days. The cerebro-spinal fluid was normal by the thirtieth day, the child having made a complete recovery.

Case II

A boy, aged 14, had been ill for one day prior to admission with rapidly developing headache, abdominal pain, and delirium. His general condition was very bad: temperature 96° F., pulse rate 62, delirious, and with well-marked head retraction. The spinal fluid was under greatly increased pressure, very milky in appearance, and contained 100,000 leucocytes per c.mm., while a stained film showed many organisms morphologically identical with meningococci. Failure to culture these organisms was thought to be due to the fact that the laboratory was some distance away. Repeated spinal puncture was performed under ether anaesthesia, and a total of 134 c.cm. of antitoxin was given intrathecally and 163 c.cm. intravenously during the first sixteen days. The number of cells in the cerebro-spinal fluid gradually fell in association with an improvement in the boy's general condition, and on the twelfth day there were 95 per c.mm., all lymphocytes, while the fluid was normal on the twenty-fifth day. The patient made an uninterrupted recovery and there were no sequelae.

Case III

A girl, aged 10, had been unwell for three days before admission with severe headache, vomiting, and general pains in the back and limbs. Her condition was very poor: the temperature was 102.4°, the pulse rate 110, and she was very irritable, with some head retraction and pronounced neck rigidity. Kernig's and Brudzinski's signs were strongly positive. The spinal fluid was under increased pressure and milky in appearance, and contained 7,000 leucocytes per c.mm. No organism was ever identified. Repeated spinal puncture was performed under ether anaesthesia, and large doses of antitoxin given intravenously: 90 c.cm. on the first day, 60 c.cm. on the second, and 30 c.cm. on the fourth. From the third to the ninth day a total of 85 c.cm. was given intrathecally. The child became afebrile by the seventh day, and the cell count in the cerebro-spinal fluid slowly fell to normal by the twenty-seventh day. There were no sequelae and recovery was complete.

Case IV

A girl, aged 13, was suddenly taken ill with severe occipital headache and increasing unconsciousness, vomiting, and involuntary movements of the limbs. She was admitted twenty-

four hours later, when her temperature was 97.4° and pulse rate 80. She was unconscious; jaw spasm was present and neck rigidity was marked. The limbs were flaccid, Kernig's sign was positive, and there was a slight strabismus. Lumbar puncture revealed a very turbid white fluid under a pressure greater than 300 mm. of cerebro-spinal fluid, which showed a count of 9,120 cells per c.mm., all polymorphonuclears. No organism could be identified. A dose of 80 c.cm. antitoxin was given intravenously, and lumbar puncture performed under ether anaesthesia each day. On the second day in hospital the patient slowly returned to consciousness, and her temperature rose irregularly to 103.2°. Antitoxin was given intravenously and intrathecally for the first thirteen days, the amounts totalling 405 c.cm. and 200 c.cm. respectively. By the middle of the third week she was afebrile, and the spinal fluid showed a normal cell count by the thirty-second day. The strabismus disappeared slowly, and by the seventh week she appeared to have made a complete recovery.

I wish to record my thanks to the late Dr. P. Vernon Davies, medical superintendent of the Kingston and District Hospital, for permission to publish notes of these cases, and to Dr. E. C. Warner, consulting physician to the hospital, for valuable advice and criticism.

REFERENCES

- Ferry, N. S., Norton, J. F., and Steele, A. H. (1931). *J. Immunol.*, **21**, 293.
 — (1932). *Ibid.*, **23**, 315 and 325.
 — (1934). *Ibid.*, **26**, 133.
 — and Schornack, P. J. (1934). *Ibid.*, **26**, 143.
 — and Steele, A. A. (1935). *J. Amer. med. Ass.*, **104**, 983.
 Hoyne, A. L. (1935). *Ibid.*, **104**, 980.

A NOTE ON THE EXAMINATION OF TUBERCULOSIS HOME CONTACTS

BY

G. GREGORY KAYNE, M.D., M.R.C.P., D.P.H.

Deputy Medical Superintendent, Middlessex County Sanatorium,
Clare Hall; late Dorothy Temple Cross Research
Fellow in Tuberculosis

It is no longer disputed that there is a greater incidence of tuberculous disease in contacts of persons suffering from pulmonary tuberculosis than in the general population. This is admitted independently of any views that may be held on the mechanism by which the disease develops in the contacts: whether it is primary infection or reinfection (endogenous or exogenous), or whether it is due to superinfection or to lowered resistance associated with poor economic circumstances in the family of a tuberculous adult. But much difference of opinion still exists on the extent of this increase in incidence in contacts as a whole and in contacts at various ages. Nor is the significance of latent tuberculous lesions as yet fully appreciated.

The subject of contact examination came up for discussion recently at the annual conference of the National Association for the Prevention of Tuberculosis (1936). It was then stressed by some speakers that active pulmonary tuberculosis in children was uncommon, although it was stated, with insufficient emphasis, that latent lung lesions and active foci in other organs occurred in an appreciable number of children in addition. One speaker pointed out that the supervision of all contacts was not a practical proposition at present. Basing himself on an index of 2.5 (according to the 1931 census the average size of the London family was 3.46 persons), and assuming that it was necessary to follow up a contact for five years, he calculated that this would mean in London the supervision of about 65,000 people. Arguing on the relative infrequency of active pulmonary tuberculosis in children, he urged that instead of paying increasing attention to child

contacts we should therefore concentrate on the adolescent group. I have already (1936) pointed out how inadvisable it was to appear to encourage neglect of examination of child contacts. It has since occurred to me that yet another aspect must be considered in this "worth-while" argument—the relative number of contacts at various ages.

The following investigation is not considered extensive enough for forming definite conclusions, but it does serve as a pointer, and its publication may encourage a similar investigation on a larger scale.

The Investigation

All the patients in the wards of the County Sanatorium, Clare Hall, were interviewed, and information was obtained on the number and ages of the persons in contact with them before admission to the sanatorium. Particular care was taken to ascertain the actual contacts in the home, and neither the family nor the house were taken as the unit. This care is necessary because of lodgers and sublet rooms, and in regard to patients living "on their own." The results are shown in Tables I to III; they were worked out separately for the men and the women patients so that there might be a slight check on the error of sampling.

TABLE I.—*Female Patients*

69 patients—211 contacts—3.0 contacts per patient.

The contacts were distributed as follows:

Age	Number	Per Cent.
0-5 years	19	9
6-15	35	17
16-30	66	31
31-50	42	20
Over 50	49	23

TABLE II.—*Male Patients*

119 patients—377 contacts—3.1 contacts per patient.

The contacts were distributed as follows:

Age	Number	Per Cent.
0-5 years	30	8
6-15	75	20
16-30	131	35
31-50	70	19
Over 50	71	19

TABLE III.—*All Patients*

188 patients—588 contacts—3.1 contacts per patient.

The contacts were distributed as follows:

Age	Number	Per Cent.
0-5 years	49	8
6-15	110	19
16-30	197	34
31-50	112	19
Over 50	120	20

Comment

There is a close similarity in the figures obtained from the male and the female patients. The figure of three contacts to a tuberculous patient is interesting as showing that the index of 2.5 may be too low in regard to families containing a tuberculous adult. It should be remembered, however, that in this investigation the home and not the family was the unit, as it should be in dealing with contacts; and another point to be noted is that at Clare Hall children under 15 were not admitted.

From the figures in the tables I should like to comment on two age groups. A fifth of the contacts are over 50. At first sight the detection of tuberculous disease in these might appear relatively unimportant. This, however, is not so. For it is in just this group that the primary case might be found—that is, the person responsible for the disease in the patient whose contacts are being examined. And the discovery of the primary case is vital, as otherwise the removal of the tuberculous

patient from the home will lead to a fool's paradise in regard to the other inmates.

The low percentage of contacts under the age of 6 is of interest in regard to the argument at the beginning of this note. Tuberculosis is a relatively mild disease in children over the age of 5. Moreover, the form it usually assumes in them (affecting bones, joints, and glands) leads to advice being sought by parents spontaneously. There is, too, the fact that children over 5 come under the supervision of the school medical service. None of these circumstances applies to very young children. In them detection of tuberculous disease or infection and the prevention of infection is of paramount importance (Kayne, 1935, 1936). The relatively small percentage (8 per cent.) of these children in the whole group of contacts would therefore hardly justify a policy that encourages less concentration on the examination of young children on the ground of the alleged large total number of contacts to be examined.

I have to thank Dr. F. A. H. Simmonds, medical superintendent, for permission to carry out the investigation, and Dr. John Tate, county medical officer, Middlesex County Council, for permission to publish this note.

REFERENCES

- Transactions of the Twenty-second Annual Conference of the National Association for the Prevention of Tuberculosis, 1936.*
 Kayne, G. G. (1935). *Proc. roy. Soc. Med.*, **28**, 60.
 — (1936). *Lancet*, **2**, 286.

SEVERE RECTAL INJURIES CAUSED BY AN ENEMA GIVEN THROUGH A RIGID NOZZLE

BY

WALTER W. GALBRAITH, M.B., Ch.B.,
F.R.F.P.S.Glas.

Visiting Surgeon, Western Infirmary, Glasgow

Injuries to the rectum following on the administration of a soap-and-water enema are not common, but when they do occur they may be of so serious a nature that I consider the following case should be put on record.

Clinical Record

A married woman, age 56, of somewhat stout build, had suffered for many years from chronic bronchitis and asthma. On March 5, 1932, she was seized with a severe rigor during the night. She felt increasingly ill during the next two days, when her doctor (Dr. W. D. Allan) was called in. He found her to be suffering from bronchopneumonia affecting one lung. Two days later both lungs were involved, and she was critically ill. In ten days' time she had improved somewhat, but was still very ill. At this time the patient was given an enema by her daughter. An ordinary Higginson's syringe with a bone nozzle, as usually supplied by chemists, was used. The result of the enema was said to be poor. The patient complained of no pain at the time the enema was given, apart from a little rectal discomfort. Following the enema she had retention of urine, which was relieved by catheterization, and two days later she complained of pain in the rectum. Pyrexia, which was attributed to the chest condition, continued. The pain in the rectum was regarded as being due to piles, there being no external evidences of any other cause. Eight days later catheterization was still necessary, and at that time the rectal pain, which had been relieved by a sedative ointment, became more severe. Faecal matter was noticed issuing from the vagina, and there was also incontinence of