

While demonstrating the case to the students, disseminated sclerosis, subacute combined degeneration, cerebro-spinal syphilis, progressive muscular atrophy, spinal tumour, and plumbism were considered. The Wassermann reaction was negative and on the grounds of spastic paraplegia, plumbism being excluded, a tentative diagnosis of disseminated sclerosis was made. The demonstrator learnt from the article of Professor Bramwell referred to above that spastic paraplegia could occur in plumbism and he then looked for a blue line on the gum, which was not there. On inquiry the patient was found to have had an abortion 2 years ago and as the pallor and uterine bleeding could not be explained by his diagnosis of disseminated sclerosis, the urine of the patient was examined for lead. Heavy traces of the metal were detected by the chemist, and the diagnosis settled. A little over three months after, the patient left the hospital, walking unsupported though with an element of spasticity, mentally much improved, without any pallor, with a normal skin, and normal menstrual functions.

Case II.—A married male, aged 32, had rather rapidly developed peripheral neuritis without any fever, with a negative Wassermann reaction and without any colic but with a constipation for a few months prior to the neuritis. There was no nystagmus. The neuritis was more of motor than of sensory type though the sensory system was by no means entirely free. While considering the aetiology of the neuritis, lead was thought of. A blue line on the gums was seen easily and the urine was sent for the examination of lead; this was detected. He was treated with sodium thiosulphate intravenously and potassium iodide orally and is on his way to recovery within four months.

Case III.—A married girl, aged about 18, 5 months pregnant, came to the hospital with a badly distended abdomen and the bowels completely locked for 6 days, the coils of the intestines appearing like a ladder under the abdominal wall, there was no vomiting, a clean tongue, a good pulse, and a good general condition. She gave a history of similar attacks for the last ten years, recurring every 6 or 8 weeks and lasting a day or two. She sought admission when she found that the attack had lasted 2 days. In this case the blue line on the gums was searched for and not found. The diagnosis of partial obstruction of the gut was made and the surgeon was summoned in consultation. The latter refused to operate unless vomiting set in or the general condition demanded it, lest premature labour might be precipitated. The patient improved on concentrated magnesium sulphate and hyoscyamus and went home a week later. Next week she was admitted again with signs of uterine bleeding, which ended in a premature delivery. While convalescent from it in the hospital she had again the attack of distension of the abdomen, obstinate constipation, etc. This compelled a urine examination for lead, which was found.

Case IV.—A school boy, aged 12 years, suffered from fever for about 2 months from February 1932, during which time he developed mitral stenosis. In April he attended for low fever and severe dyspnoea. A diagnosis of pericardial effusion was made and was confirmed by x-rays. A partial recovery from it was made by July 1932, when he was seen a second time for œdema all over the left side of the body and left pleural effusion. The œdema soon extended to the right side, but remained always more on the left. There was oliguria and the urine showed much albumen with a trace of sugar, and marked acetonuria. There was definite starvation prior to these symptoms. The diet being limited to a small quantity of boiled milk and very occasionally some bread. The diagnosis of avitaminosis was made by a consultant, and vitamins and a good diet were prescribed. No improvement followed a fortnight's trial. This having been pointed out to the consultant, the latter ordered a urine examination for lead and the report from the chemist showed that this diagnosis was correct.

Case V.—An educated man was going home from work

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A NEW CORNEAL SCRAPER FOR TATTOOING

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TATTOOING of very dense opacities of the cornea for æsthetic as well as for optical purposes is quite an old operation. The material commonly used was Indian ink which was introduced into the deep parts of the cornea with either a grooved tattooing needle or an instrument consisting of a number of fine needles in a handle. The results of this small operation were not always very satisfactory, and in a number of cases the effect did not last very long. To remedy these defects, a new technique was devised by which permanent colouring of the cornea could be effected.

The little operation is done as follows:—

The eye is anaesthetised, preferably with butyn 1 to 2 per cent., instilled twice at an interval of five minutes. Cocaine should be avoided as far as possible on account of its drying and exfoliating effects on the corneal epithelium. The eye is washed with a 1:5000 hydrargyri perchloridum solution and later with sterile distilled water. Saline is not to be used on account of its decomposing effects on the solutions used for tattooing. The next step is to scrape off the superficial corneal epithelium. Ordinary Graefe's knives, secondary knives, scalpels, discission needles, pterygium knives and many other instruments have been used to scrape the cornea, but not being satisfied with any of these instruments, I have devised a special corneal scraper of which an illustration is given herewith. The corneal epithelium is very lightly scraped, particular care being taken to scrape the margins of the opacity. If care is not taken in doing this, the result is a black-coloured central spot with white linings. In scraping the cornea, one has to be very particular in those cases where there is partial anterior staphyloma and the iris lying closely matted with the spurious cornea; if care is not taken here, the resulting uveitis may be so

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one evening, after a period of heavy strain, when he fell down in the road and became 'unconscious'. He remained 'unconscious' for three days after which he was brought to Ahmedabad. When seen he was mentally confused, cerebation was very slow, paraplegia was present and he could not sit up; paræsthesia was noted but this might have been an association of the mental confusion. Blue patches were found on the gums and a diagnosis of lead encephalopathy with other evidence of plumbism was made and confirmed by urinary analysis.

The patient rapidly improved, and could walk with assistance within ten days.

REFERENCE

Bramwell, E. (1931). Some Clinical Pictures Attributable to Lead Poisoning. *Brit. Med. Journ.*, Vol. II, p. 87.

strong that more harm than good to the eye may be the result.

After scraping the cornea well, as stated above, it should be wiped out with a pledget of lint dipped in sterile distilled water and squeezed absolutely dry. Then follows the application of the staining solutions.

A 2 per cent. solution of gold chloride in sterile distilled water is kept ready in one test-tube and a 2 per cent. solution of tannic acid in another test-tube. A little cotton-wool is wrapped on two probes. With one of the probes, gold chloride solution is applied to the scraped part of the cornea and allowed to dry for fully five minutes. At the end of five minutes, the solution of tannic acid is applied with the other probe. Within a minute or so, the whole white part so treated assumes a fine black colour which remains there for a number of years.

One caution is necessary and that is the avoidance of the use of fixation forceps with sharp teeth. If these forceps are used and if the solution is allowed to touch the part of the conjunctiva that has been gripped by the forceps, permanent black coloration of that part of the conjunctiva remains behind. To avoid this mishap, the fixation forceps should be without any teeth.

After-treatment.—The eye is bandaged for about 48 hours; no solution should be dropped into the eye, if the irritation is not very great. Pad and bandage may be discarded after 48 hours. If there is any irritation of the iris, or tendency to iritis, a drop of atropin for one or two days will put the matter right.

Results in my experience have been quite satisfactory and especially after the use of the special corneal scraper. The instrument was originally made for me according to my design



by Messrs. N. Powell and Co. of Bombay, to whom my thanks are due, and later by Messrs. John Weiss and Sons, Ltd., of London, who are now making this instrument and have included it in their new catalogue.

FATAL FLEXNER BACILLUS INFECTION IN AN ANTHROPOID APE (*HYLOBATES HOOLOCK*)

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It is of some interest, if not importance, to determine the pathogenicity or otherwise of the ætiological agents of human disease to the higher apes, since such studies may possibly throw light upon the evolution of human diseases. Thus Dobell (1930) has shown that *Entamoeba histolytica* parasitizes not only man,

but also monkeys of genus *Macacus*, and probably other monkeys as well; the monkey strains being as virulent to kittens as are the human ones. Knowles and Senior White (1930) have discussed the possible relationship of monkey-malaria to the disease in man, whilst Knowles and Das Gupta (1932) have shown that monkey-malaria is transmissible to man and may cause quite severe symptoms in the human host.

The following account of a fatal attack of bacillary dysentery in an anthropoid ape may thus be of interest.

The monkey in question was a 'hoolock' (*Hylobates hoolock*), weighing 1 kg. 880 gms., a female, of small size, but fairly well nourished. According to the statement of the contractor who supplied it, it was captured in 1930 together with five other animals of the same species in the hilly jungles near Gauhati in Assam. Of these, one died in transit to Calcutta, and two others within two months of arrival in Calcutta (showing how difficult it is to acclimatise these animals), whilst the monkey in question was one of the three survivors when purchased in 1932.

The first experiment carried out on this monkey was to test it with monkey-malaria. The parasite used was the natural *Plasmodium* of the monkey *Macacus irus*, described by Knowles and Das Gupta (1932). 0.5 c.cm. of blood containing 192,000 parasites per c.mm. (all ring forms) was injected subcutaneously on 20th February, 1932. Previous examination daily of blood films from the hoolock for one week had shown that it was free from natural *Plasmodium* infection of its own.

After an incubation period of ten days the hoolock showed very scanty parasites in its blood films. Seven days after the appearance of parasites in its blood the monkey looked ill and showed no inclination for food. Blood films at this stage showed a fair number of parasites (1,280 rings and growing trophozoites per c.mm.). Quinine bihydrochloride gr. $\frac{1}{2}$ was now given intramuscularly; the parasites disappeared the next day, and the animal gradually improved in health.

The second experiment carried out on this animal was the attempt to infect it with human malaria; as it was an anthropoid ape it was hoped that this might be successful (several previous attempts to infect *Macacus rhesus* with the three different species of human malaria having proved unsuccessful in the writer's hands). In order to prove that the hoolock was free from all malaria infection 0.1 c.cm. of its blood was injected into a young *Macacus rhesus* (an animal exceedingly susceptible to monkey-malaria). The *Macacus rhesus* remained alive and well and showed no parasites for two weeks, thus proving that the hoolock had recovered completely from the first infection.

On the 6th April, 1932, 5 c.cm. of blood from a human patient with quartan malaria, showing 960 parasites per c.mm. (rings and mature schizonts), were injected subcutaneously into the hoolock. Blood films were examined daily for a period of a month and a half, but no parasite was found at any time. [The paradox seems to be now established that monkey-malaria is fairly readily transmissible to man, but—with the exception of the very doubtful experiment of Mesnil and Roubaud (1917)—that human malaria is not transmissible to monkeys. This may mean that monkey-malaria is the older of the two diseases and that human malaria may have originated from it.] This infection completely failed to take.

On 1st June, 1932, the hoolock was found to be passing slimy liquid stools with bright red blood very frequently, and had a rise of temperature to 106.2°F. Blood films showed no parasites present, but apparent leucocytosis. Examination of the stools showed a picture typical of bacillary dysentery; they were crammed with pus cells, with unaltered red blood corpuscles, with