minimum manipulation the graft is fitted as accurately as possible into its bed. The surface of the graft should be flush with that of the surrounding cornea. The conjunctival flap is drawn firmly and gently over the site of the graft in the manner of a tent, keeping the deep surface of the conjunctiva clear of the graft until the purse-string suture has been drawn together and tied. The ends of the suture are held up and the conjunctiva allowed to drop gradually over the site of the graft. The ends of the suture are then cut, two or three drops of sterile atropine, 1 per cent., and ol. paroline are instilled into the conjunctival sac; the lid margins are smeared with sterile vaseline, and the upper lid drawn down over the eye and the lid suture strapped to the cheek.

The lower lid suture may be retained to facilitate opening the eyelids when dressing the eye, and thus to prevent any accidental pressure on the globe. A Cartella shield, covered with sterile gauze, is strapped over the eye, and the patient placed in the dorsal position with one pillow.

Pre-operative Treatment

It is as well to leave the patient in the dorsal position for three weeks, a time considered necessary for the graft to take securely. No dressing need be done for three or four days after operation, and then all that is necessary is to swab the lid margins and instil a few drops of gutt. atropin., 1 per cent., and ol. paroline. The lid margins are then smeared with sterile vaseline and closed

over the eye. After this it is seldom necessary to do more than dress the eye as described above on alternate days.

Dilatation of the pupil to a point which enables the iris to be clear of the graft and not to form an anterior synechia is desirable. An adhesion between the iris and the graft leads to its opacification and vascularization. About the sixth day the centre of the conjunctival flap opens and exposes a small area of the graft, and by the eighth day the conjunctiva has receded enough to display completely the grafted area. The conjunctival sutures are removed on the eighth day, and the conjunctiva gradually recedes to the limbus during the ensuing week or ten days. The eye may be protected from injury and from the effects of light by the use of a Kirkpatrick transparent shield, tinted to correspond approximately with Crookes's B.1 blue glasses, moulded over the appropriate area of the patient's face and held securely by tapes tied round the head.

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ASPIRIN POISONING

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Severe toxic and even fatal results have been observed from the common, homely remedy known as aspirin. The ease with which aspirin, or its chemical equivalents, can be obtained renders the occurrence of poisoning therefrom a possible problem of diagnosis and treatment in the day's work of any medical practitioner. The drug may be classified among those which produce noxious action after a relatively long period of time following ingestion, and, since the progress of the symptoms and signs is somewhat gradual, it is not unusual for many hours to have elapsed before the person taking the drug comes under medical observation. Since a very large dose is necessary to produce dangerous symptoms, the patient suffering from aspirin poisoning has generally taken the drug with suicidal intentions. There is evidence to indicate, however, that some persons who are considerably debilitated through acute or chronic illness may be unsuspectingly susceptible to an amount of the drug which in a physically healthy person would cause but relatively slight disturbance. Personal idiosyncrasy is also known, and rapid allergic type symptoms may occur.

It is the purpose of this paper to make some observations on several cases of aspirin poisoning which have occurred in Birmingham.

A Case with Recovery

The patient was a female aged 52, whose previous health had been fairly good, except for periodic mental depression. On August 9th, 1935, at 4 p.m., she took about one hundred 5-grain tablets of aspirin made up in a mixture with milk. At 7.30 p.m. her husband found her looking rather ill and gave her a small drink; she vomited a little afterwards. Two hours later she was admitted to hospital in a semi-comatose state. There was profuse sweating and pallor. Respiration rate was 35 per minute and a little shallower than normal; pulse rate was 105 and poor in volume. The pupils were normal. The patient could be roused to answer some questions.

Soon after admission to the ward the stomach was washed out with several pints of weak sodium bicarbonate solution, and ten ounces of warm coffee passed into it. The urine showed a light cloud of albumin and a high content of salicylic acid. Lumbar puncture was carried out, and 30 c.cm. of clear cerebro-spinal fluid were allowed to escape slowly; the fluid was under a moderately increased pressure. The high degree of sweating continued. Soon after the lumbar puncture there was definite clinical improvement, but respiration remained quicker than normal and somewhat deeper than on admission. The mental power of the patient became clearer, and she complained of a choking sensation in the throat and some pain in the back of the head. About eighteen hours after admission the alkali reserve of the blood was 40 volumes per cent., which indicated a moderately grave compensated acidosis.

The patient had received 60 grains of sodium bicarbonate four-hourly for twelve hours and ample fluid by the mouth. Twenty-four hours after taking the aspirin her general condition was very much improved; but she had then developed considerable deafness with tinnitus, and she indicated the presence of a subjective feeling of pressure in the head and a feeling of constriction round the skull. She felt as though she was being lifted up in the air, a sensation that disappeared quickly when she sat up in bed for a few minutes. Profuse sweating continued for thirty-six hours. The blood pressure returned to 122/80. There had been no objective changes in the nervous system. A reactionary pyrexia reaching 100° F. occurred after forty-eight hours. The respiration rate and pulse rate declined to normal after three days. The urine was entirely free from salicylic acid four days after admission.

A Case from the Literature

In comparison with the above I should like, at this stage, to include certain observations of S. C. Dyke on a case of aspirin poisoning recently published in the *Lancet*,¹ inasmuch as his case reveals a series of clinical phenomena of considerable interest and importance.

In summary, Dyke's case came under medical observation a few hours after the patient, a young woman, had consumed probably 435 grains of aspirin, the symptoms and signs at that time being nausea and tinnitus, leading to deafness and mental wandering a few hours later. Restlessness and disorientation were the phenomena observed during the following night, and by the next morning stupor and signs of cerebral irritation were evident. Respiration was deep and

slow, and considerable dehydration had ensued. The patient was treated with fluids and glucose enterally during the day. On the evening of the next day (thirty-six hours after the drug had been ingested), the patient's condition was much the same. Lumbar puncture was performed and the pressure found to be 180 mm. water. Cerebro-spinal fluid was removed until the pressure declined, and as a result there was much improvement. The procedure was repeated later with further benefit. (Salicylic acid was found in abundance in the cerebro-spinal fluid.) Seventy-two hours after the onset the patient's physical condition was a great deal better, but the mental processes were still dull. She complained that her head felt enormously large, and she performed curious stroking movements of the hands towards the scalp. The vision was streaked and barred. Visceral damage had occurred during the toxæmia, as indicated by albumin and bile salts in the urine. Later observation indicated complete recovery.

Notes on Four Fatal Cases

An unfavourable result must be recorded in each of the following cases.

Case 1.—A man aged 45 was the subject of chronic depression. He left home one morning at 10.30, and on his return home at 11 p.m. he was perspiring very freely, was somewhat disorientated, and was unable to give any account of his movements during the day. His breathing was heavy and laboured; he appeared strange in his manner and cyanosed. His underclothing was saturated with perspiration and he complained of great thirst. A few hours later (probably about twelve hours after the aspirin had been taken) he became delirious, and shortly afterwards, during a series of convulsions, he died of cardio-respiratory failure. Search revealed two aluminium aspirin bottle tops in his coat pocket. Necropsy confirmed the suspicion of aspirin poisoning. The exact amount of aspirin that he had taken during the day could not definitely be ascertained.

Case 2.—A man aged 72 was subject to attacks of mental depression. On May 1st, at noon, he went out, returning home at 4.30 p.m. He had some tea to drink and then went upstairs, after asking for assistance in taking off his boots. He was observed to be unusually tired and somewhat strange in his manner. At 6 p.m. he called a relative and said he was "feeling bad" and that he had poisoned himself. He had taken 150 tablets of aspirin during the early afternoon. He vomited some dark-coloured fluid, and profuse sweating was noted. He volunteered the remark that he thought the poison would have acted much more quickly. Death occurred approximately twelve hours after the drug had been taken.

Case 3.—A man aged 50 decided while staying in a hotel to end his life; he wrote to a relative to that effect, indicating that he would be dead before the letter arrived next morning. The relative visited the hotel immediately he received the letter, but found the man had left. He proceeded to the man's home, and at 11.30 a.m. found him in a semi-stuporous condition. Information was given, however, to the effect that he had taken 200 tablets of aspirin while in the hotel, with the hopeful expectation of rapid dissolution. His hopes were not fulfilled, so he decided to walk to his home, where he gradually passed into coma and died—probably about twelve hours after he had taken the aspirin.

Case 4.—A man aged 38 had suffered from a tuberculous hip for several years and was in the habit of taking up to 30 grains of aspirin to relieve the pain. On February 28th he took 40 grains, and during the next few days he continued to take large doses every few hours. Vomiting occurred at intervals, and later he was quite unable to retain any fluids. Dehydration became considerable. During a period of thirty-six hours he took about 200 grains of aspirin. He became semi-conscious and remained so for about forty-eight hours, when he died.

Several interesting phenomena emerge from these cases. The onset of recognizable symptoms is usually delayed for a few hours, this interval probably bearing direct relation to the rate of absorption of the drug. Although gastrointestinal irritation, with associated vomiting, may occur, the leading clinical disturbance is connected with the nervous system, and, in the untreated case, reaches its

crescendo in the course of twelve hours or more, when dissolution may take place as a result of profound cerebral depression. Progressive diminution of function can be traced from the higher to the lower nerve centres. Disturbance of heat regulation occurs, and profuse sweating may be regarded as an important clinical sign in the diagnosis. The type of respiration seems to vary in different cases, and typical "acidosis" breathing is not invariably seen.

The toxic effects of acetylsalicylic acid are potentiated by associated dehydration, which is likely to reach a major degree as a result of the respiratory changes, the very considerable perspiration, and the prolonged effects of the drug. Auditory and vestibular disturbances are outstanding in some cases. Reference to the patient's mental state, the presence of severe perspiration and of respiratory changes, and examination of the urine for salicylic acid should enable the diagnosis to be made. A period of several hours usually elapses before dangerous cerebral phenomena arise. Acceleration of these latter signs may occur in a person debilitated by previous chronic disease. The dangerous dose of aspirin probably varies considerably around 400 to 500 grains, but, in the light of more recent observation on the beneficial results of treatment, lethal effect may be avoided even when more than 500 grains are ingested.

Dyke has outlined, in the report of his successfully treated case, the principles of treatment in salicylic acid toxæmia. The visceral action of the drug is considerably intensified by the associated dehydration, and it is therefore imperative to combat the depletion of tissue fluids and especially to encourage and retain adequate renal secretion. If enteral fluid cannot be received, the continuous intravenous drip method (glucose saline) should be used. Excretion of the acid occurs in the sweat and the urine. The cerebro-spinal fluid contains the drug in considerable amounts, and, undoubtedly, lumbar puncture played a leading part in the recovery of the patient in two of the recorded cases. No such treatment, however, was carried out in the four fatal cases. It seems reasonable to believe that even when symptoms and signs in this form of poisoning have reached an advanced stage, the combined therapeutic effect of the introduction of fluid to the body and the simultaneous aspiration of the cerebro-spinal fluid will be a means of saving an otherwise hopeless situation. In fact, the efficacy of such rational treatment is revealed in this paper.

I must express thanks to Dr. W. H. Davison, H.M. coroner for the city of Birmingham, for his kind permission to utilize certain records in his department.

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The American Association for the Study of Goiter again offers the Van Meter Prize Award of 300 dollars and two honorable mentions for the best essays submitted on the goitre problem. These essays should not exceed 3,000 words, be presented in English, and a typewritten double-spaced copy must be sent to the corresponding secretary, Dr. W. Blair Mosser, 133, Biddle Street, Kane, Pennsylvania, not later than March 1st, 1936. Manuscripts received after this date will be held for competition next year or returned at the author's request. The committee did not consider any of the manuscripts submitted at the last annual meeting to be of a calibre to justify the award, and consequently the award for 1935 was withheld. The association will publish the winning manuscript in its annual *Proceedings*, and reserve a place on the programme of the annual meeting for presentation of the manuscript by the author, if he is able to attend. This will not prevent its publication, however, in any journal selected by the author.