nitrogenous products. In general, boiled meats, chicken, and fish are preferable to roast joints. Eggs are usually admissible, but a light breakfast of wholemeal bread and butter, or toast and marmalade, followed by fresh fruit, is better than heavy dishes of fish, or bacon, sausages, and eggs. Table salt should be avoided when renal, cardiac, or cerebral complications are present, a non-pressor table salt being substituted, if craving is felt, consisting of ammonium hippurate 1 part, potassium nitrate 4 parts, potassium chloride 25 parts.

Drinks.—Water is the best, and should be taken on an empty stomach an hour before meals and at bedtime. Where the water is hard, as in London, it may with advantage be softened by a permutit or other water-softening plant. Pure English table waters are Stretton, Malvern, Braceborough, and still salutaris, which latter is distilled water passed over forest burnt wood charcoal to render it palatable. Of the French mineralized waters, Evian, Vittel, and Contrexéville enjoy a deserved reputation in flushing out the kidneys. One pint of water for each five stones of body weight, imbibed during twenty-four hours, is a good working rule. Other drinks should be taken sparingly; China tea or tea freshly made with milk is to be preferred to Indian blends; H.A.G. caffeine-free coffee may replace the ordinary coffee. Alcohol is best not taken at all.

General Habits.—Tobacco is best avoided. Cigar smokers are more prone to arterio-sclerosis than pipe or cigarette smokers. Exercise should be well within the limits of fatigue, and elderly people should not vie with their juniors in tests of endurance. Motoring, but not at great speeds, suits most, but not all. Golf should be preferred to tennis for those in whom age changes have begun to be manifest. Finally, the keynote of avoidance as well as of control of arterial pressure may be summed up in the four words of advice—moderation in all things.

Special Modes of Treatment.

Deep breathing exercises, relaxation, and passive movements, resistance exercises, and massage have their appropriate uses. General massage combined with Swedish movements is a most useful therapeutic adjunct in lowering raised arterial pressure. X rays, high-frequency, and diathermic currents in experienced hands yield good results. Some subjects benefit from ultra-violet radiation, which balances opposite abnormalities of arterial pressure. In emergencies, such as threatened or actual apoplexy, lumbar puncture is of timely aid, as well as in warding off or relieving uraemic convulsions or severe congestive headache. Venesection up to 500 c.cm., followed by fasting for a couple of days, gives relief to an embarrassed circulation, particularly in the presence of venous stasis.

Drug Therapy.

For the toxæmia resulting from intestinal stasis rectal injections every morning for three weeks of a pint of solution of potassium permanganate, 1 grain in water, after the method advocated by Dr. Nott, is often of great value, any constipation being at the same time corrected by tablets of lactobyl or taxol. Calomel at night, twice weekly, in 2-grain doses, with a teaspoonful of equal parts of sodium and potassium sulphate on the morning following, is useful in thinning the bile, and by inducing a greater flow lessens intestinal putrefaction. Though it is impossible to disinfect the intestinal tract, monsol tablets or T.C.P. emulsion are at times serviceable in lessening toxic products of fermentation and putrefaction.

In the lesser grades of hyperpiesis 2-drachm doses of potassium chloride thrice daily in a tumblerful of water give encouraging results. For the cardiac types, theominal, a combination of luminal with theobromine, promotes diuresis and lowers arterial pressure. Iodides I have found of little use, greater effect being obtained from oral administration of the French tincture of iodine, 5 minims in water or milk after meals, with gradual increase of dosage, or by hypodermic injection of an iodine compound such as tiodine. In all cases of cardiac decompensation there is no drug to compare with the time-honoured digitalis in standardized preparations.

More recent remedies are: (1) liver extract, which often induces considerable lessening in the height of pressure and affords relief of symptoms in the majority of cases, those without arterio-sclerosis offering the best prognosis. Lilly's heparmone contains a histamine-like substance, and is one of the best preparations for intramuscular injection up to 5 c.cm.; (2) sodium sulphocyanate, also where organic changes in the arteries are absent, is useful in 3-grain tablets by the mouth; (3) choline derivatives, such as pacyl, may be given in tablet form, or acecoline (acetylcholine hydrochloride) parenterally; (4) animasa, an extract of the muscular coats of arteries of young animals, has been found of benefit in sclerotic cases when long continued; (5) anabolin has given me no results which are appreciable.

I have left treatment by baths and waters till last, since these demand still further study. Effervescent carbonic acid baths exert on arterial pressure reduction or increase, depending upon the pre-existing state. They can be obtained either naturally aerated or artificially prepared at many spas, notably at Royat, Spa, and Nauheim. Manipulation baths and douches are beneficial in high pressure cases, and in those of low pressure associated with circulatory stasis.

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CEREBRAL ABSCESS FOLLOWING TONSILLAR INFECTION.

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THE occurrence of cerebral abscess as a direct sequel of tonsillar infection is rare, and deserves record. In the *British Medical Journal* of June 29th, 1929 (p. 1158), Housden describes a case of cerebral abscess following acute tonsillitis, and points out that there is little or no reference to such an association in the literature.

I am indebted to Dr. Francis Roberts and to Dr. T. Pearse for some of the following notes.

A boy, aged 7 years, suddenly became ill one afternoon with a temperature of 101.4°, and was found to be suffering from severe acute tonsillitis. In addition, he had old mitral disease of rheumatic origin. He was kept in bed, and his temperature fell to normal in eight days, but in view of the cardiac condition he remained in bed for a further three weeks.

Five and a half weeks from the onset of his attack of tonsillitis the tonsils and adenoids were removed. Following this his convalescence took a normal course for five days. He then suddenly developed a sharp rise in temperature accompanied by a rigor. His chest was carefully examined at this time, but no trace of broncho-pneumonia was detected. He rapidly became seriously ill; vomiting was not a marked feature. On the day following the rigor weakness was noticed in the lower part of the left side of his face; on the following day some weakness in the left arm appeared, and shortly afterwards slight weakness in the left foot. On the fifth day after the rigor this had developed into a complete left-sided hemiplegia. On the seventh day he was definitely drowsy; his temperature was 101°, and the discs were reddened and congested. On this day he was admitted to hospital.

On admission the boy was in a drowsy, almost stuporous, state. The temperature was 98.2°, the pulse 68, and the respirations 32. He could, however, be roused, and no sensory or motor aphasia was present. There was a left-sided hemiplegia, paralysis of the face and arm being more marked than that of the leg. The tendon reflexes were brisk on the right side and very much subdued on the left. The abdominal reflexes were equal and present; the plantar reflexes were marked extensor on the right and faint on the left. Kernig's sign was not definite, but the neck seemed slightly rigid. There was no vomiting. The pupils reacted to light and to accommodation; there was no nystagmus, and no oculomotor paresis. The other cranial nerves were normal. Mr. Bernard Chavasse reported that both discs were blurred and red, with some swelling in their lower halves. A coarse systolic murmur was heard at the apex of the heart. On examination of

the lungs nothing abnormal beyond signs of some congestion at the bases could be discovered. The cervical glands on the left side were enlarged.

A lumbar puncture was performed. The cerebro-spinal fluid showed a slight increase in globulin and total protein; the sugar reduction was diminished, the chlorides were normal, and the cell count 18 per c.mm., the lymphocytes and polymorphonuclears being in equal proportions. No micro-organisms were seen and the culture was sterile. Blood was also taken for culture, but only staphylococci, which were considered to be due to a contamination, were found.

The gradual "march symptoms" of a hemiplegia formed a definite indication of a cerebral abscess in this case. The boy's condition was extremely grave on admission, and in addition he had valvular disease of the heart. However, the localization of the abscess being adequate, it was decided that the chance of operation should be given, but unfortunately he did not survive.

There are two theories of the production of cerebral abscess after tonsillectomy. One is that infected pulmonary emboli result from the sepsis in the tonsillar bed; the other, that septic material is inhaled while the patient is under the anaesthetic, and that the cerebral abscess is secondary to one or other of these conditions. The present case—in which early broncho-pneumonia was demonstrated at the necropsy—would appear to fall into the group of the latter theory. The possibility of cerebral abscess, though rarely associated with tonsillar infection, is not to be ignored.

Vertical section of brain, showing location of abscess in sub-cortical region of right frontal lobe.

A post-mortem examination was performed by Dr. R. T. Chadwick, who reported as follows.

The brain dura mater was dark in colour and congested. The arachnoid and pia mater were intensely congested and opaque; the blood in the vessels was fluid. No signs of emboli and no pus were discovered. The convolutions on the right side were flattened

and the ventricles were filled with clear cerebro-spinal fluid, the left being normal in size, the right flattened by the abscess.

The abscess, which was filled with greenish-red, thick pneumococcal pus, was $2\frac{1}{2}$ inches in diameter and circular in shape; it was situated posteriorly to the fissure of Rolando, extending downwards from the vertex about $1\frac{1}{2}$ inches on the external surface, and the same distance on the internal surface of the right hemisphere, lying about $\frac{1}{8}$ inch deep to the brain surface. On the vertex the meninges were intensely congested, and the abscess showed signs of pointing. The medulla was congested, and there were no pressure marks. No sign of tuberculosis or post-basis meningitis was detected, but the brain substance was intensely congested generally.

The tonsillar fossae were found to be healing after the operation, and no sloughs were present. The cervical glands were slightly enlarged, but there were no abscesses therein. The lungs showed an early and moderately intense broncho-pneumonia; the air passages were intensely inflamed. There was great right-sided dilatation of the heart, the mitral orifice admitting two fingers. Old endocarditis was present on the mitral cusps, but the tricuspid and aortic valves were healthy. There was general congestion of the alimentary system, and the mesenteric glands showed evidence of past healed tuberculosis. The kidneys were greatly congested.

ORBITAL CELLULITIS IN CHILDREN.*

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SINCE orbital cellulitis may occur in children of a few weeks old there is no age limit. The essential feature is proptosis of the eye associated with signs of inflammation. Proptosis alone is not sufficient for its diagnosis. Proptosis unassociated with inflammation may be caused by a cyst, a mucocele, a new growth, or what not. Until one meets the combination of a congested eye and pink swollen lids with proptosis the diagnosis cannot be established. Once made, a grave prognosis should be given and the help of the specialist sought.

The diagnosis is not, however, always easy, as it is at times very difficult to be sure whether or not proptosis is present when chemosis of the conjunctiva and a swollen lid are the most prominent features. But it is on the existence of this sign that the diagnosis will depend. Proptosis is mechanically produced by congestion of, or exudation into, the orbital tissues behind the orbital fascia. This is a dense and well-fitting septum separating the orbit proper from the conjunctival sac and the anterior segment and interior of the eyeball. It matters not how severely infected an eye may be, orbital cellulitis, with its cardinal symptom of proptosis, will not arise unless the orbital fascia is penetrated.

It is clear, then, that orbital cellulitis must not be diagnosed because oedema of the eyelid is present, or even cellulitis of the eyelid. The latter is often due to the spread of infection from a hordeolum or impetiginous sore in the neighbourhood; and oedema can often be traced to a cellulitis of the scalp or face, or dacryocystitis, and is then present merely by extension, owing to the loose cellular structure of the lids.

Again, an intense purulent conjunctivitis, gonorrhoeal or diphtheritic, may occasionally give rise to a pink and

swollen lid; ocular diphtheria is frequently at first monocular. The diagnosis will be established by the presence of a profuse discharge or of a membrane on the everted lids. For the determination of the presence or absence of proptosis lid retractors are essential. These may be improvised by the use of two hairpins bent over near the blunt end. If a local cause has been discovered for the swollen lid, whether abscess, conjunctivitis, dacryocystitis, or foreign body, it will be treated on appropriate lines. If none such is found and proptosis is present or strongly suspected, a grave view must be taken of the case, as it is one of orbital cellulitis.

Orbital cellulitis in children has, so far as my experience goes, three chief causes:

1. Skin infections, such as impetigo, hordeolum, fly-bite, boils, or any facial wound, with accidentally superadded virulent infection. This is more likely to be met with in older children. The temperature is generally very high; septic cavernous sinus thrombosis and general septicæmia with pneumonia are likely to supervene, and they often end fatally and rapidly. The infection passes by the angular vein to the cavernous sinus. Fortunately such cases are rare.

2. Nasal sinus infection, the commonest cause, is met with in young infants as well as in older children. The temperature is not usually very high and the child is not very ill. The eye is pushed outwards as well as forwards. This is a strong diagnostic point. I will go so far as to say that if the eye is not displaced outwards the case is not nasal in origin. In these cases the services of the rhinologist should be sought; he will, if he thinks necessary, open up the antrum or ethmoidal cells. I believe the most usual condition is an ethmoiditis. If the proptosis is only due to cedema it will gradually subside. If, however, pus has formed in the orbit a counter-opening between the nose and eye may be needed. Convalescence is slow but sure, and the eye is not usually in jeopardy. I have seen a considerable number of cases of this type of cellulitis in the last fifteen years. They are sometimes associated with the exanthemata.

3. Osteomyelitis or periostitis of the orbit is a third principal cause. Until about three years ago I had not seen such a case. I was then asked to attend a young

*An address given to the Paediatric Section of the New South Wales Branch of the British Medical Association on April 11th, 1930.