- Park and Biggs, 1912-13: Collected Studies, Bureau of Laboratories, Health Department, City of New York.
 Permin, 1913: Communications de l'Institut sérothérapique de l'Etat Danois.
 Ritter, 1915: *Muench. med. Woch.*, April 23th, 1915.
 Rosenau and Anderson, 1908: *Bull. Hyg. Lab., U.S. Public Health Service*.
 Rowan, 1910: *Journ. Amer. Med. Assoc.*, February 12th, 1910, p. 533.
 Ruediger, 1913: *Philippine Journ. Science*, viii, Sec. B, pp. 138-142.
 Schoute, 1915: Abstract in BRITISH MEDICAL JOURNAL, January 2nd, 1915, p. 45.
 Siemon, 1914: *Muench. med. Woch.*, December 1st, 1914.
 Simon, 1909: *Muench. med. Woch.*, p. 2264.
 Simon, 1914: *Muench. med. Woch.*, November 10th, 1914.
 Stricker, 1914: *Deut. med. Woch.*, December 24th, 1914, p. 247.
 Teutschländer, 1915: *Deut. med. Woch.*, May 13th, 1915.
 Walther, 1914: *Presse médicale, Paris*, October 8th, 1914.
 Weintraud, 1914: *Bert. klin. Woch.*, October 19th, 1914.

THE CONTROL OF "DIPHTHERIA-BACILLUS CARRYING"; AND THE JASMIN OIL METHOD.

By WILLIAM EWART, M.D., F.R.C.P.,

CONSULTING PHYSICIAN TO ST. GEORGE'S HOSPITAL, TO THE BELGRAVE HOSPITAL FOR CHILDREN, ETC.

The revelation of the unsuspected evil of "carriers" arose from a study of the longer and less direct route followed by the dissemination of typhoid, although the recrudescence of diphtheria epidemics at schools had long been identified with a readmission of pupils certified (after an adequate convalescence) as clinically cured. The notion that these were minor relapses after the cure continued to be held for a while after the first observation (by Kayser in 1906) of the spread of typhoid by a "cured-typhoid" bacillus carrier. Since then we have recognized the more subtle and possibly frequent danger from the "typhoid-intact" carrier; and it is now admitted that diphtheria also may have its "cured-diphtheria" and its "diphtheria-intact" carrier, both needing their local internal sanitation, though with a less remote and extensive seat of infection than in typhoid.

That result does not appear to have been achieved. This late publication of suggestions originated and practised long before the "carrier" period has been occasioned by a recent inquiry by a correspondent (BRITISH MEDICAL JOURNAL, 1915, vol. ii, p. 459) for a reliable method of curing diphtheria carriers. My first paper in 1897 (BRITISH MEDICAL JOURNAL, vol. ii, p. 1564), in conjunction with my then house-physician, Dr. W. A. Hubert, was mainly concerned with tracheotomy dangers—namely, to safeguard the patient against the dangerous suppression of his cough mechanism inflicted for the sake of an air-way; and to help him, less through antiseptics than by the expectoration of the infective material and by a recovery of some of the impaired ventilation and circulation of the lung. It also referred, however, to my antecedent treatment for several years. This contained potentially all the clinical work that followed: practically the "spreading oil-film method" as a mechanical substitute for the impractical principle of corrosive antiseptics, which is inapplicable to the healthy membrane of the carrier. It is to be regretted that that effort should have passed unnoticed in this country; although in France some reference has subsequently been published to an intranasal instillation of oil which, perhaps, may still be in vogue. Owing to that oversight, and to the lack of systematic institutional opportunities for any test by results, I now offer this method only as a tentative proposition for the purpose of disinfecting carriers. Yet it has not lacked clinical evidence for its feasibility and for its benefits, under active infection.

I had realized the desirability of forestalling any extensive secondary sinus infection, and if possible of suppressing it gradually during treatment, whilst at the same time mitigating the severity of the local trouble. Eventually instructions were given for a systematic toilet at least twice daily in all my cases of diphtheria from the beginning of and throughout their hospital treatment. Antitoxin, which came in as the supreme agent for the clinical cure, did not displace that hygienic indication. I may mention, in illustration of the cleansing power of oil, the benefit derived three weeks ago by an adult patient with bilateral pulmonary phthisis, operated on last February for polypi and still suffering from them, but now unfit for surgical interference. The discomfort was greatly relieved by the first application, and, within three or four days, the

severe foetor from which he had suffered for years was completely suppressed. In this instance, however, I had followed up the oil supply with an insufflation of boracic powder, immediately.

The original disinfecting purpose led me to take within the systematic scope of the method practically all the infections (including influenza, whooping-cough, mumps, tonsillitis, etc.) which own an ori-nasal origin or extension. Meanwhile the mechanical "oil-film by water carriage" disclosed its ability to reach beyond the feebly moistened glottis and to give relief to an inflamed tracheal or bronchial membrane; though its greatest benefaction is in easing the acute catarrhal upper nasal obstructions, as well as all the acute and chronic catarrhal affections of the naso-pharynx, fauces, and upper larynx.

The method itself has hardly varied from its original form, except for the discarding of carbolic acid (1 in 60) and the substitution of jasmin oil, which is exceptional among flavoured oils in its freedom from the irritating effect of any added essential oil. The mechanism of the method is simple, but needs judgement. It is not free from the influence of the psychical factor, which the sense of relief usually cures provided this is not marred by inexperience in the patient or the nurse. The main idea is still the original one of utilizing to the full the downward action of the cilia, and to sweep the mucous membrane with a continuous moving film. The supply must therefore be from above, not as in spraying, douching or syringing from below. Though introduced at the nostril the oil is collected in the upper fossae. The rapidity of the radiating spread of the film by surface tensions is great in proportion to the moisture of the surface and to the fluidity of the oil. Our main concern is its after movement practically independent in time from the first, and practically uninfluenced in its direction by those evenly centrifugal radiations, which broadly coincide with it in one hemisector of the field whilst contrary to it in the other. Whether "up or down," the cilia work the transportation towards the external orifice. From a charged frontal sinus it moves downwards, the same way as the massive discharge from blowing the nose, and also backwards. But in the trachea any "descending" film would be moved upwards, the same way as if it arose from an intratracheal injection. The film is, of course, a passing show, easily broken up by absorption. Its full value is in its frequent renewal with adequate charges.

The simple implements are an eggcup to hold a small supply and a penfller to convey the oil into the nose—namely, for an adult, a charge nearly half filling the tube. The patient reclines on a bed or flat couch with a narrow bolster, and spreads a towel well up to the chin or higher. The essential is to throw the head well back behind the bolster and to maintain it there for half, or the whole of a minute after charging both nostrils. The oil must not be rushed up or run in, but instilled drop by drop. The other essential is the complete lateral movement of the head to the right for a while and then to the left, to favour the irrigation of the sinuses, as that small supply cannot fill them. As the head is gradually levelled the oil is felt to trickle down the back of the naso-pharynx. This is the only unpleasant sensation. But that surplus is not considerable. It may be swallowed; or better, by refraining from swallowing, it may be allowed to find its own way down the larynx and trachea. It is better to have assistance, but most of my patients succeed in their unaided performance on the strength of these simple directions. I believe—but must leave the decision to those with larger opportunities—that this method, with the addition of the insufflation, if duly persevered with, is the most likely one to rid a carrier of his influenza or of his diphtheria bacillus.

BIBLIOGRAPHY.

- BRITISH MEDICAL JOURNAL, 1897, vol. ii, p. 1564. Ibid., 1898, vol. i, p. 1381. Ibid., 1899, vol. i, p. 342. *Lancet*, 1899, vol. i, p. 377. Ibid., 1899, vol. ii, p. 780. Ibid., I. A. Grimes, 1899, vol. ii, p. 409. Ibid., 1899, vol. ii, p. 1808. Ibid., 1909, vol. i, p. 33.

THE *Medical Record* states that out of 600 applicants for the United States Navy examined recently in Boston only 30 were accepted, the remainder being rejected as physically below the normal or mentally or morally unfitted for the service. From this, Rear Admiral Albert Ross draws the conclusion that America must make its rapidly degenerating citizens into men before they can be made sailors or soldiers.