found. With the marked temperatures the foulness of the mouth was remarkable—more than is usually found, even in such cases.

Climatic Conditions.

In this epidemic, as in others reported, climatic conditions seem to have had no influence on the disease. According to the Registrar-General's monthly report for October for Edinburgh, the difference from the average air temperature for the month was -3.6° . The percentage humidity was 82 and the rainfall was 2.57 in. in excess, the winds being generally from west or south-west. The average death-rate in Edinburgh for the month was 18.3, and from influenza alone 4.8.

Housing has also apparently no influence, as the influenza mortality in Aberdeen was 8.3, and in Dundee, whose housing conditions are much inferior, it was 3.9.

Treatment.

On admission with fever, 10 grains of quinine sulphate were given within the first twelve hours, and, unless the temperature had begun to fall, the dose was repeated within the next twelve hours. During the fall of temperature 6 to 8 grains of quinine were given daily and 4 grains daily during the whole period in sick bay and for three days after discharge. When there was any complaint of pain 10 grains of aspirin were given three times in twenty-four hours. With the onset of cough an expectorant mixture was given thrice daily, or every four hours, as required; when there were catarrhal signs at the bases, hot poultices with mustard relieved the symptoms. For sore throat, gargles with permanganate of potash or swabbing with 2 per cent. iodine were satisfactory, but the foul mouth required to be cleansed by a nurse.

Windows were kept open night and day, and in many cases the beds were close to them. No special efforts were made to warm the rooms, and no difference was found between the cases nursed in rooms with fires and those in rooms without heating. Efforts were made to change the body linen as frequently as possible. Few or no restrictions were made in diet, as each was allowed to have what she asked for, plenty of milk being given to those who were thirsty, and in most cases light diet was preferred to the ordinary rations.

VACCINE TREATMENT OF INFLUENZA.

BY

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At the wish and suggestion of Surgeon Commander Rees, we have in these sick quarters adopted the routine administration of influenza vaccine prepared at the Royal Naval College, Greenwich (consisting of *B. influenzae* 60 million, streptococci 80 million, pneumococci 200 million per cubic centimetre), as a curative treatment in all cases of influenza.

Our routine has been that the patient, on admission, is given 0.112 c.cm. of the vaccine; forty-eight hours later this dose is repeated, and afterwards as often as necessary at intervals of forty-eight hours. After the first dose the quantity of the vaccine may be increased, but this depends on the reaction to the previous dose.

The treatment has been attended with such success that it may be of interest to quote one or two cases:

Case 1.—E. F., admitted on the first day of his illness; temperature 103° . Given 0.112 c.cm. vaccine. Temperature on the second day not above 100° . On the third day a second dose of vaccine given; temperature 99.6° . On the fourth day the temperature was normal, and patient convalescent.

Case 2.—J. K., admitted November 9th; temperature 105° . Was treated with usual medical routine treatment. The temperature fell to normal on November 16th, but on November 17th he had a relapse. The temperature on November 18th was 102° , and subsequently oscillated between 101° and 99° ; abundant mucopurulent sputum and moist râles in the chest pointed to purulent bronchopneumonia of a severe type. On November 23rd 0.112 c.cm. of the vaccine was given, and subsequently at intervals of forty-eight hours. Marked and continuous improvement in the chest symptoms was soon noted. The negative phases in this case were very marked from a subjective point of view; the patient complained of severe pains in the back and chest, sweating, and temporary increase in the cough; on this account the dose was not increased. He is now quite convalescent.

Case 3.—H. B., admitted November 10th; temperature 103° . On November 14th he developed pneumonia of a septic type (respirations 64) associated with delirium. On November 20th very little hope was entertained of his recovery, but 0.112 c.cm. of the vaccine was given. This was followed by a rise of temperature of 0.8° , but in twenty-four hours' time the delirium was less, and in forty-eight hours he was quite rational. The subsequent three doses of 0.112 c.cm. were associated with rises of temperature of 1.4° , 1.4° , and 0.8° . As the symptoms of the negative phase decreased, the dose of vaccine was gradually increased. Since the first inoculation the patient has shown a steady and progressive improvement, particularly as regards respiration, decrease of cough, and sputum. On December 7th he was allowed to get up.

Case 4.—A. D. D., Lieutenant R.N.R., was admitted on November 23rd with a history of having been ill since November 18th, suffering from symptoms of influenza, for which disease twelve of his crew had been left at his last port of call. On admission he was semi-delirious (temperature 104°) and presented definite signs of early pneumonia. On November 24th he was still cyanosed and semi-delirious, respirations 32. Vaccine 0.112 c.cm. given. On the same evening the temperature was 102.4° and respirations 44. On November 25th respirations 40, mentally much clearer; temperature 100.2° . By November 26th, in the evening, the respirations had fallen to 24 and the temperature was normal. The vaccine was repeated. He was discharged to sick leave quite convalescent on December 1st. The prognosis in this case on admission and on the day subsequent was extremely bad, as judged by the embarrassment of respiration, cyanosis, and delirium.

In conclusion I may state that since November 23rd, when the use of the vaccine was introduced in these sick quarters as the routine treatment, we have admitted 13 cases of influenza with not a single complication resulting; the cases have all shown influenza of a mild type. It is, of course, possible that this happy result is due to the type of the disease becoming milder as the epidemic dies away, but what is certain is that the injection of the vaccine does not cause any symptom in any way prejudicial to the patient's chance of recovery. I have been very favourably impressed by the great improvement in the patients' moral after the injection; they seem to feel that they are on the high road to recovery.

MYOLOGICAL PRINCIPLES: A NEW ULNAR SPLINT.

BY STUART A. MOORE, B.A., M.D., M.R.C.P.,
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In the treatment of peripheral nerve lesions splints should be applied in such a way that, while they prevent over-stretching or fatigue of weakened or paralysed muscles, they interfere as little as possible with the other motor functions of the limb. Further, splints should be so devised and adjusted that as recovery occurs the weak muscles are free to perform, even when in the splint, those functions of which they are capable.

The above statement is surely a truism, but in practice its truth is commonly ignored, and there are but few who realize the importance of consistent application of these simple rules in the after-treatment of injuries to limbs. I venture to suggest, however, that such application of these principles in our practice would be a factor of some financial interest to the State. Their importance is like that which belonged to the discovery of the sharp-pointed screw, and is proportional, not to the simplicity of the ideas, but to their wide and easy application.

To any one who grasps the idea, many instances where these principles are commonly transgressed will occur, but in illustration of their application I will describe a splint which I have found useful in dealing with ulnar nerve lesions.

The splinting is for a typical recovering ulnar nerve lesion, weak adduction of thumb, and some ulnar claw in the fourth and fifth digits. The splint used is made of vulcanized wood fibre and needs no padding. The size and shape are indicated in Fig. 1, its manner of application in

FIG. 1.

Figs. 2 and 3. The splint is first secured to the palmar aspect of the fingers by a narrow band of adhesive plaster which passes over the back of the proximal phalanges only. It is often advisable to protect the back of these

FIG. 2.

FIG. 3.

phalanges by a layer of lint. During this application the metacarpo-phalangeal joints are kept flexed, so that the splint is prevented from rising too far up the palm. A second band of strapping is fixed, over the first, on the back of the phalanges, the two ends cross in the palm and wind round the side of the hand, so that extension of the metacarpo-phalangeal joints is impossible.

Previous to the application of the splint it is necessary to put on the band of strapping advocated by Colin Mackenzie to prevent abduction of the thumb. This is not shown in the figure. The effect of this splint is to give correct position, to prevent extension of the proximal phalanges or flexion of the mid and distal ones, that is, the deformity that occurs. The movements lost—flexion of the proximal and extension of the two distal phalanges—are free to occur as the muscles recover. No muscle is entirely prevented from functioning, as there is some little play allowed, but no harmful movement can occur.

In a high ulnar nerve case, with involvement of the flexor carpi ulnaris, an additional splint is needed. This consists of a Jones's cock-up splint, but it is applied not, as is usual, to the anterior, but to the posterior aspect of the forearm and hand, and acts therefore as a cock-down splint, keeping the wrist in some degree of flexion. It is secured to the limb by two bands only; one passing just above the wrist and one higher up the arm. The hand is free to flex fully but not to extend.

The associated physical treatment advocated is based on Colin Mackenzie's work, and has this advantage, that the treatment requires little apparatus and can be given little and often, for, except at the outset, when the patients are learning the exercises, they can be treated in classes three or more times daily.

The patient is instructed what not to do. "Never dorsiflex the wrist. Never fully abduct the thumb. Never fully extend the proximal, and never flex the mid and distal phalanges."

In treatment the cock-down splint is unbuckled and removed with the arm pronated and the wrist flexed. The wrist is alternately actively flexed and partly extended. The dosage of exercise is determined by the behaviour of the flexor carpi ulnaris and stops short of fatigue. The progression of exercise is secured by allowing increased range of movement, increasing the number of movements made, and by increasing the work done by the muscle against gravity. This last effect is obtained by gradually changing the position of the forearm in which the exercise is performed. Full supination is the position from which the final exercise of wrist flexion is made in each treatment, provided of course that the muscle is fit for this. Each day, however, the first movements are made from the position of pronation.

The band that holds the thumb in adduction is then removed, the forearm supinated, and without allowing any real abduction of the thumb, the patient adducts as strongly as he can and then relaxes merely. Progression is secured as before, by allowing increased range and number of movements and by working round to the position of full pronation. As the case progresses the band is applied more and more loosely, but is removed only when complete recovery has occurred.

The strapping that limits the movement of the metacarpo-phalangeal joints is removed, and a band of webbing is buckled round the hand to prevent any inadvertent abduction of the thumb. The forearm is pronated, the wrist held straight. Flexion of the fingers at these joints is

then practised, first with the forearm pronated. Progression of position is to full supination.

In order to exercise the power of extension of the middle and distal phalanges, the exercise is at first done in the splint and the splint removed only for purposes of cleaning and readjustment, and perhaps in order to make sure that no neuritic stiffening of the fingers is occurring. Later, however, the splint is removed, and the proximal phalanges held by the patient, while the two others are actively extended and more or less flexed. The progression of position is from full supination to full pronation of the forearm. Adduction and abduction of the fingers is then practised.

The bands and splint are then reapplied. The patient is instructed to perform the exercises while his hand is in the splints as occasion offers. The use of this apparatus, which involves a minimum of interference with the functions of the limb, should be continued until nearly complete recovery occurs. This method of treatment gives the quickest results, and is the most correct I know psychologically and myologically. In its practice is based on accepted principles. Every one agrees that voluntary movement of a muscle is of greater therapeutic value than is electrical stimulation, but commonly in practice the latter is used as if it were more important than the former.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

VACCINES AND SERUMS SUPPLIED TO THE ROYAL NAVY FROM THE R.N. MEDICAL SCHOOL, R.N. COLLEGE, GREENWICH.

PREVIOUS to 1916 the greater part of the vaccines required were received from the inoculation department of St. Mary's Hospital, through the courtesy of Sir Almoth Wright; since then the undernoted quantities have been prepared in the laboratories of the medical school by the naval staff, assisted by a civil bacteriologist who joined for the war from Armstrong College, Newcastle.

Typhoid vaccine	5,400 c.cm.
Paratyphoid vaccine	21,500 c.cm.
Triple typhoid vaccine (Naval formula)	247,700 c.cm.

The triple vaccine is a mixture of *B. typhosus*, *B. paratyphosus* A, and *B. paratyphosus* B, heated to 55° C. for half an hour, and 0.5 per cent. phenol then added.

Cholera vaccine	8,600 c.cm.
Prepared from several strains of Balkan origin.	
Antisepsis vaccine	48,400 c.cm.
A mixed polyvalent vaccine containing streptococci and staphylococci.	
Influenza vaccine	144,000 c.cm.
A mixed polyvalent vaccine containing <i>B. influenzae</i> , streptococci and pneumococci.	
Melitensis vaccine	1,380 c.cm.
Staphylococcal vaccine	910 c.cm.

All antitoxins and serums prepared elsewhere were issued to the various divisions, dépôts, and ships from the school:

Tetanus antitoxin	14,800 doses.
Diphtheria antitoxin	2,400 "
Antidysentery serum	2,800 "
Antistreptococcal serum	1,250 "
Antimeningococcal serum	5,000 "

And others in smaller quantities.

During 1917 and 1918, 30,900 c.cm. of triple typhoid vaccine was prepared at the R.N. Hospital, Malta, and distributed locally to the fleet in the Mediterranean.

P. W. BASSETT-SMITH, C.B., C.M.G.,
Surgeon Captain R.N.

THE TREATMENT OF THE WAR PSYCHO-NEUROSES.

DR. MIDDLEMISS (December 21st, 1918, p. 700) in commenting on the paragraph under the above heading (BRITISH MEDICAL JOURNAL, December 7th, 1918, p. 634) asks: "Do we as a matter of fact find that the patients are unable to recall the emotional disturbance which has led up to the present disorder?" and answers: "Unwilling they may be, but not, I contend, as a rule unable."