A PRELIMINARY NOTE ON THE KINEMATOGRAPH IN MEDICINE.

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THE results which I have obtained with the kinematograph as an aid in the teaching of nervous diseases, and which I have been able to demonstrate at the Middlesex Hospital and elsewhere, have met with such expressions of encouragement from my colleagues and other members of the medical profession as to lead me to think that it may be of some interest to publish a few notes on the uses and possibilities which this method of demonstration appears to offer. In connexion with the teaching of medicine diseases of the nervous system are especially well adapted for bioscopic illustration, since the abnormalities of movement can be all faithfully reproduced.

The illustrations accompanying this article are enlarged from isolated examples taken from a section of films and they depict the momentary attitudes of the patients as photographs were being taken of them at the rate of 16 a second. For the care and trouble taken in producing these films I have to thank Mr. Charles Urban. From the appearance of these enlargements some idea may be gathered of the sharpness of definition which is obtained in the original films. These are all pictures of abnormal movements of pronounced character and will form the basis of the demonstration which, at the invitation of the council, I hope to give before the Medical Section of the Royal Society of Medicine at the end of January.

The first figure illustrated is that of a man with ataxy of the limbs who is depicted in this photograph as he is in the act of turning and the position of the left leg, in which the trouble is the more pronounced, gives some idea of the type of gait which can be so well seen in the moving pictures, as likewise can the incoördination of the arms, and the tendency to fall backwards, to which he is also subject.

The next two figures are illustrations from a case of disseminated sclerosis. The ataxic-paraplegic walk and the attempts to preserve the balance by the movements of the arms are well shown; in the second picture the patient has been photographed while in the act of drinking in order to bring out the "volitional" tremors. His efforts to raise the glass to his lips, accompanied as they are by tremors of increasing amplitude and spilling of the water, make up a picture which cannot fail to impress itself on all who see it. From this case films have also been taken to show nystagmus and the rapid oscillations of the eyes as they are turned to one side or the other can be clearly seen and, moreover, can be contrasted with an example of slow nystagmus which has been obtained from a case of Friedreich's disease.

In the fourth figure we have an example of a paraplegic gait resulting from a myelitis.

The fifth picture is taken from a case of pseudo-hypertrophic paralysis in which the characteristic waddling method of progression is shown, and here the instantaneous photograph has depicted the patient's right leg in the position of "high-stepping" gait which is so apt to be assumed by patients with such muscular weakness as makes it difficult for them to clear their feet from the ground. Bioscopic illustrations have also been obtained of the method by which this patient gets up from the ground by "climbing up his legs."

The sixth figure is taken from a case of cerebral diplegia with athetosis. The continual squirming, involuntary movements which affect the head and face as well as the hand, are realistically shown and films have also been obtained of the patient walking.

The seventh figure illustrates the posture of a case of paralysis agitans, and by means of the bioscope the characteristic tremor of the hands can be seen. The typical "mask"-like face can be easily identified by a series of pictures which show the rigidity of the countenance being maintained while the patient is talking, and this has been made still clearer by comparison with the facial expression of another case in which tremor has arisen from a different cause.

The last picture shows the act of testing the knee-jerks.

Enough has been said to give a general outline of some of the movements which have been already photographed for demonstration, but it is, of course, possible to record all

the main diagnostic points of a case, as in one instance has been done. The absence of signs can also be recorded as well as their presence and the presence or absence of anaesthesia can be demonstrated by asking the patient to raise his hand or to make other signs indicating his abilities to feel or not as the case may be. To begin with, one has naturally chosen cases where the movements have been of an exaggerated nature, but the fact that nystagmus can be shown is a clear indication of what can be done with movements which are less pronounced. Indeed, given a suitable light, it is possible to take the finest movements and I hope shortly to be able to demonstrate this by showing the movements which occur during the electrical reactions of muscles.

No doubt ideas will occur to readers in which a record of many medical cases other than those of nervous diseases will be useful, for the whole aspect of a case is often different according to whether it can be seen in lifelike movements or only in stationary illustrations. The practice of surgery would also seem to offer great facilities for demonstration by kinematograph, but hitherto, so far as I am aware, little or no serious work has been undertaken for purposes of teaching. It is true that a French surgeon has had bioscopic pictures taken of some of his operations, and extremely interesting as these pictures are in depicting technique and in demonstrating the possibilities which are thus opened up they cannot be regarded as being of serious use for systematic instruction. For the purpose of instruction it is necessary that the great principles should be illustrated and for this purpose it will almost certainly be best to take photographs from the cadaver where the desirable positions and lights can all be arranged at leisure. Operations on the eye would probably afford excellent examples for teaching purposes, as also would the manipulations of dislocations and fractures. Needless to say it is neither necessary nor desirable that the identity of the operator should be brought into the pictures. Only his hands need be taken and, indeed, apart from obvious ethical reasons, to do otherwise would to a large extent decrease the value of the photograph by obtaining an extended field at the expense of a loss of detail.

Photographs of moving micro-organisms must be ranked among the most striking results that have hitherto been obtained with the kinematograph. The movements of the various bacilli—e.g., those of typhoid fever—can be shown on the screen and should be of value in the teaching of hygiene and bacteriology. The teaching of physiology should also benefit by this method, inasmuch as various physiological experiments which it is frequently impossible to repeat before a class could be demonstrated as often as required.

For the general purposes of class teaching in medical and other forms of education there can be no doubt that the kinematograph will prove to be very useful and its management is but little more trouble than that of the ordinary lantern. Moreover, with the most modern types of machine it will be possible to stop at any one picture and thus to combine with the kinematograph all the advantages of an ordinary lantern without any danger of firing the films.

It may be taken, however, that we are as yet only at the beginning, so to speak, of this method of observing pictures of moving life, and, indeed, I am given to understand that at the present time a small hand machine in which the movements will be obtained by a simple clockwork motor and for the illumination of which the reflected light of an ordinary electric lamp, candle, or daylight will be sufficient, is in course of construction. Such a contrivance will form an important addition to the equipment of the practitioner who is unable to keep in touch with the larger centres of education, for in addition to his reading he will be able to study many of his cases as they appear in life, and to the student there will be given another valuable method of revising and summarising his knowledge.

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DESCRIPTIONS OF ILLUSTRATIONS ON PAGE 13.

- Fig. 1.*—Case of ataxy showing patient in the act of turning.
Fig. 2.—Case of disseminated sclerosis showing an ataxic-paraplegic gait.
Fig. 3.—Intentional tremors in disseminated sclerosis. Note the spilling of the water as the patient attempts to raise the glass to his mouth.
Fig. 4.—A case of paraplegia following myelitis. Note the manner in which the left foot is being dragged along.
Fig. 5.—A case of pseudo-hypertrophic paralysis showing the waddling and "high stepping" gait.
Fig. 6.—A case of cerebral diplegia with bilateral athetosis.
Fig. 7.—A case of paralysis agitans in characteristic attitude.
Fig. 8.—Photograph to show the knee-jerks being tested.

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

FIG. 7.

FIG. 8.