Summary of Statistics.

		No. of Cases.	Per cent.
Class I ...	Diabetes	53	10.6
Class II ...	First diagnosis confirmed	143	28.6
Class III ...	First diagnosis confirmed with addition	96	19.2
Class IV ...	(a) First diagnosis confirmed with differentiation (b) First diagnosis not confirmed	74 9	14.8 1.8
Class V ...	Gastro-jejunostomy	18	3.6
Class VI ...	Second diagnosis differing materially from the first	96	19.2
Class VII ...	No diagnosis	3	0.6
Class VIII...	Errors in second diagnosis	8	1.6
		500	100.0

It has probably occurred to my readers that the various classes into which I have divided the cases run into one another and that the boundary line must often have been indefinite. This was so, and on that account the actual figures must not be taken too seriously. If there has been bias in the process of classifying I have tried to direct it towards the swelling of Class II—cases in which the first diagnosis was confirmed—and Classes III and IV a—in which the diagnosis was added to or made more accurate, rather than towards Class VI, in which the diagnosis was altered.

In the following table some of the classes are thrown together to obtain a general view.

General Classification.

		No. of Cases.	Per cent.
Class I } Class II }	First diagnosis confirmed	196	39.2—40
Class III } Class IV a }	First diagnosis confirmed with important addition or differentiation	170	34.0
Class VI } Class IV b }	Diagnosis altered after examination	105	21.0

Therefore, in 40 per cent the diagnosis was confirmed, and in 55 per cent. it was modified or altered.

We may summarize the figures by the statement that out of 500 consecutive cases of varying nature, of which two-thirds were abdominal cases, the first diagnosis made on the history, symptoms and signs was confirmed by appropriate laboratory examinations and tests in 40 per cent. of the cases, was materially added to or modified in 34 per cent., and was altered in 21 per cent.

It appears, therefore, that in over half of the cases a material advance was made in diagnosis by the methods of investigation used.

We must never forget, ladies and gentlemen, that the ultimate unit is the patient and not the case. No objective investigation will ever enable us to do without personal observation. A laboratory report may be the corner-stone of the diagnosis, but it cannot of itself be the diagnosis. For example, a man may harbour the germ of an infective disease or may have a stone in his kidney whilst his ill health is due to another complaint or condition altogether. The doctor must observe and appraise the patient himself, his symptoms, signs, temperament and circumstances, using also all other means that the growth of knowledge has given.

[The address was illustrated by lantern slides.]

CONCLUSIONS.

1. The first need in diagnosis is the careful study of the history, symptoms, signs, and general condition of the individual patient. By such means an accurate diagnosis was made in 40 per cent. of 500 patients.

2. In a large proportion of cases, especially those in which the functions of secretion, nutrition and excretion are affected, or in which infections, calculi or growths are present, the routine use of scientific methods of investiga-

tion is an invaluable aid. In over half of the series of 500 cases the preliminary clinical diagnosis was modified or changed after routine investigations had been made.

3. Facilities for such examinations are at present widely needed, especially for folk of moderate means as compared with those who are treated in public hospitals and with the well-to-do.

4. For want of such investigations large numbers of patients are given advice and treatment which is not the best suited to their complaints, hundreds of unnecessary operations are done, and hundreds of operations that ought to be done are left undone.

RESULTS OF THE PEPTONE TREATMENT OF ASTHMA.

WITH A NOTE ON THE TREATMENT IN CERTAIN PATHOLOGICALLY ALLIED CONDITIONS.

BY

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In previous communications¹ the peptone* treatment of asthma was described in detail, and it may now be profitable to consider the extended results. These are based on a fairly large number of cases, all of which received treatment over a year ago. It was formerly pointed out, *inter alia*, that certain types of cases were amenable to the treatment; that the method of immunizing depended on the type of case; that no reaction appreciable to the patient should follow the injection (intravenous); and that the latter should be made slowly.

The treatment has been instructive in respect of the grouping of asthmatical cases. Two main groups occur which show no tendency to pass into each other. One group comprises such as quickly respond to the treatment, and the effect is more or less lasting, the recurrences being infrequent and milder in character. The other group is resistant, and is subdivisible into such as are totally resistant and those in which, by careful immunization, the disease may be largely overcome.

Group 1.

The first group presents as a rule most of the following characteristics: General good health, little family predisposition, limited duration of the disease (though a variable factor), regularity in recurrence of attacks, freedom from bronchitis and emphysema. This group is illustrated by such cases as the following:

Male, aged 22. Has suffered for four years. Attacks occur regularly every night during winter and spring; less frequent in summer. They last from one to three hours, and some relief is obtained by burning asthma powder. Is quite well in the daytime. After seven injections the attacks began to yield and ceased entirely after the tenth. The patient remained quite free of asthma for about a year, when he returned desirous of having some treatment as a prophylactic for the winter months. There has been no return of the asthma.

The relief, however, is not usually as complete as this. More frequently the history is somewhat as follows:

Female, aged 37. Asthma four and a half years; worse in summer. Is disturbed practically every night by slight attacks, for which she burns the usual powders, but, in addition, about every three weeks she suffers a bad attack which prostrates her one or two days. The response to treatment was very rapid, she soon began to have good nights, and could exert herself without any respiratory discomfort. After eleven injections she remained quite free for five months, when the disease returned in a milder form. Another short course of treatment was given, and during the next year she only had three slight attacks.

Such cases might be multiplied almost indefinitely. The treatment is simple and the results very gratifying. The only trouble encountered is the taking of "colds," to which our population is doomed during the greater part of the year. This is often a most distressing factor, and one can only wait and resume.

Occasionally cases are encountered which, from the

* Although it is the proteose fraction of the peptone of commerce which is the active ingredient, I have retained the term "peptone," as it has not yet been proved that the peptone fraction is without any effect.

history, would seem to belong to the second group, but in reality are of the simpler type. As an instance:

Female, aged 45. Has suffered for eighteen years, the asthma developing after childbirth. At first the attacks occurred about monthly, but then changed to weekly. Worse in summer. Attacks last on an average twelve hours. A short course of treatment brought the attacks to an end, no trace of the disease appearing for many months. During the past year she has only had occasional mild attacks, brought on, as she thinks, by indigestion.

None respond better to the treatment than children. In them I make the injection into the spinal muscles, basing the practice on an observation by Meltzer that the venous arrangements in these muscles are such as to cause the absorption of the medicament to approximate more to an intravenous injection. Witte's peptone must not be used, as it may cause a severe local reaction. Most other varieties, however, are innocuous in this respect. The same dose as that used intravenously for an adult should be given, but in double concentration.

Boy, aged 6. Shortly after birth developed eczema, which lasted for two years. On its disappearance asthma set in. The attacks lasted from a few hours to a week; then about a week's respite. All the year round. The attacks quickly began to yield and ceased after eight injections. He remained perfectly well for three months, when an attack supervened. Seven months elapsed before he had another, then three months, and four months. It has not been necessary as yet to repeat the treatment.

Girl, aged 3½. Attacks since the age of one year, lasting for three days. Then about four weeks free, with perfect health. She received eight injections into the spinal muscles, and now seventeen months have passed without any recurrence.

Boy, aged 13. Asthma for five years. Attacks lasted seven days with two months' interval; all the year round, and also after exercise, such as games. Since treatment two years ago, he has not had a trace of asthma, and can play a strenuous game of football.

Bronchitis complicating asthma in a child is not the bar to treatment which it presents in an adult. None of the children hitherto treated have been refractory.

Group 2.

A few observations may first be made regarding cases which resist the treatment. They include nearly all those with chronic bronchitis and developed emphysema, and cases presenting any degree of cyanosis, even without bronchitis. Also those in whom, apart from the asthmatical paroxysms, a more or less oppressed condition of the respiration is practically never absent. As a rule, the affection has lasted many years, dating from childhood, or from the age of puberty, and a family history of asthma can nearly always be elicited; sometimes hay fever also is found. Often the only effect that can be produced in such cases by means of peptone—and it has very important bearings—is the complete suppression of the attacks for a short period by a mildly toxic dose. For two or three weeks the patient for the first time experiences complete relief and thinks a cure has at last been made, only to be sadly disappointed. The dose of peptone necessary to effect this desensitization must be carefully considered in relation to the individual case, and should produce, in from one to two hours, headache, malaise, shivering, slight rise of temperature, sickness, with pain in the abdomen and diarrhoea. Sometimes a herpetic eruption occurs about the mouth or more widespread.

But this group also includes many cases in which very satisfactory results may be obtained, as follows:

Male, aged 29. Asthma for twenty years, induced without any obvious cause, but also precipitated by what he described as "horse dust." Of rather an asthmatic "habit," breathing slightly laboured, a low degree of emphysema, with a fairly good chest expansion. Bronchitis was occasionally troublesome, and there was considerable expecoration after the attacks. These occurred as a rule nightly, but from time to time he had bouts lasting a few days. After three weeks' treatment there was no definite improvement. The method of immunizing was modified, and the dermal reaction to peptone recorded. In the fifth week a definite improvement set in, and after eight weeks the asthma had ceased; there was no oppression of the chest, and he could easily and freely expand it. A year later he wrote: "During the past year I have not had one bad day or night; only one or two slight attacks owing to weather changes."

Immunization in Certain Cases.

In regard to the immunization in difficult cases there are two if not three necessary considerations: (a) The rate of injection of the peptone and its dilution, (b) the peptone

to be used, and (c) the indications afforded by the dermal reactions as the case proceeds. If the patient takes the peptone well larger doses may succeed, given by very slow injection to avoid reaction. If the patient is sensitive to peptone, however, great care is required, as the larger dose given in this way may precipitate an attack of asthma. Rarely this occurs very quickly—in a few minutes—with concomitant flushing of the face, especially if Witte's peptone be used, which seems to contain a toxic ingredient not present in muscle peptone. Again, a mixture of peptones sometimes succeeds best. The dermal reaction (which may be produced by a von Pirquet borer) is not of much value at the beginning, as non-asthmatical subjects may give it, and it varies considerably in different persons, but as immunization proceeds it ought to lessen, and finally disappear—that is, show no distinction from the control made with the solution in which the peptone is dissolved. Experience proves that the immunizing injection should never reach the critical point; it only injures the immunity mechanism. As a general rule also, there ought to be three clear days between each injection. Another case in which the result was very satisfactory may be cited:

Female, aged 23. Had suffered severely since 3 years old. Had tried every known alleged remedy without any benefit. The attacks lasted from four days to a week, with about three weeks' remission. During this time, however, she suffered from constant nocturnal asthma, lasting from 2 a.m. to 7 a.m. Had but little bronchitis and a very moderate degree of emphysema. Improvement did not set in until the fifth week, and from this time onwards the patient had "tightness" in the chest but no definite attack. This sense of tightness or oppression was only induced on exertion. She continued so for three months, when attacks began, but lighter in type. Another course of treatment was given, with the result that only the "tightness" remained as before, and a few months elapsed ere the attacks recommenced. They did not last long, and for months past the patient has been better than ever before.

Reference may finally be made to two cases which closely resembled each other and showed features of considerable interest:

Boy, aged 14. Fairly well grown, but of the asthmatical "habit." The disease had existed "ever since birth." Family history of asthma. Attacks occurred about every ten days, and lasted three to five days, when he had to be propped up in bed. Was well between the attacks. Dieting was without any influence. The attacks were preceded and ushered in with sneezing, headache, sickness with vomiting, diarrhoea, and fainting fits. Treatment revealed that the boy was sensitive to peptone, 10 minims of a 2 per cent. solution of Witte's peptone producing a distinct reaction. It was diluted with beef peptone and carefully regulated. Punctually to time the attack came on, but the next attack, though punctual, only lasted one day. The next, however, did not arrive until the eighteenth day, and was of a light character. Treatment was continued for two months, with an interval of ten days after the first month (this is often advisable in sensitive cases). The attacks had now ceased, and during the next two months he had only two minor attacks. For the last eighteen months occasional but much lighter attacks have occurred, and the boy has gained much in weight and looks ruddy.

The interesting point in the case is that the onset of the attack was accompanied by symptoms identical with those following a mildly toxic dose of peptone, and herein may lie the explanation of the condition of sensitiveness to that substance on the patient's part. Curiously enough, while this boy was under treatment another case, also in a boy, with practically identical history and symptoms was encountered. The attacks also began with headache, shivering, vomiting, etc., and for years he had suffered severely. The result of treatment was excellent, as he has only had two minor attacks in the course of the past year.

In the large number of cases of asthma treated during the past three years the patient's diet has been largely a negligible factor. The diet must, of course, be regulated, but the cutting out of certain articles rarely produces any marked or lasting effect. No doubt there are cases, but they form a small class, in which idiosyncrasy exists in respect to some particular food (which may be entirely carbohydrate). The same applies to asthmas caused by animal or vegetable emanations. Again, the dyspnoeic attacks in bronchitis may be due to the products of bacteria locally. But in the great majority of genuine asthmatics the explanation is rather to be sought in a defect in the hydrolysis or metamorphosis of foreign protein residing in the digestive organs or in the lymph or the body cells. To this protein poison the asthmatic

individual is sensitive, and the bronchial muscles contain the dominant receptors for it.* This sensitiveness may be either hereditary or acquired, and is influenced by climatic and other environmental conditions. This leads one to consider the likelihood of other organs or tissues behaving in a similar manner, and causing recurrent fulminant disorders in which no local gross lesion is discoverable. The fact that in animal experiments the protein poison or a foreign protein selects different organs in relation to the species may be of some significance in this connexion.

The Application of Peptone Therapy to Cases Pathologically Allied to Asthma.

It has just been stated that where sensitiveness to a particular foreign protein exists, it is common to the organism as a whole, though the brunt of the attack seems to fall on a particular part—in the case of asthma, on the smooth muscle of the bronchi. Such a part or organ possesses a positive chemotactic relationship to the antigen, either from some peculiarity in itself or in the antigen. An antigen similar in nature, therefore, to that which provokes asthma in one individual may cause explosive attacks in the stomach or liver or central nervous system or circulatory system, etc., in others. I first put this view to the test some little time ago in a case of migraine:

Female, aged 37. Had had right-sided migraine since the age of puberty. Looked well, and was otherwise in good health. At first the attacks occurred about once a month, but during recent years they recurred regularly once a week. No family history of migraine or asthma. Diet was without any influence. Worse in spring. They began with pain and throbbing in the right side of the head, which gradually got worse, and attained its maximum in twelve hours. Then sickness with vomiting came on and lasted about half an hour, which seemed to bring some relief. The pain then gradually subsided, and in another twelve hours the attack was over. The peptone was administered as for asthma. A day or two after the second injection the attack was due, but did not appear. The patient, however, reacted to the third peptone injection (showing sensitiveness), and this caused a headache which lasted a few hours. The dose was reduced, and the peptone slightly altered. Excellent progress was made, the attacks becoming slight and infrequent, the last report stating that the patient was completely free from headaches.

Of course one swallow does not make a summer: but as a beginning it is encouraging. Treatment is also being tried in cases of severe recurrent gastric and hepatic attacks which prostrate the patient at the time and are succeeded by a variable period of good health, but the time for their discussion is not yet ripe.

Rationale of the Treatment.

It must in the first place be recognized that, though it may be convenient and indeed correct to speak of these cases as "anaphylactic," yet there is no such thing in nature as the anaphylactic shock which we artificially produce. Clinically, "anaphylactic" means sensitive. But when we inquire how the immunization by means of peptone may be supposed to act, the phenomenon of artificial anaphylaxis forms the basis of our conceptions. This phenomenon is brought about by whole protein as the antigen. Proteose, on the other hand, is only feebly antigenic—that is, it has but slight power of sensitizing to itself; it does not form complement binding antibodies, nor does it produce a precipitate with the homologous serum. In view of the importance of the latter point in anaphylaxis, serums from two cases treated with peptone were kindly examined for me at the Lister Institute, but with entirely negative results. As to the power of proteose to desensitize to whole protein, the experimental results are rather conflicting, as many of them were obtained by denatured proteoses, but there is certainly an effect.

In artificial anaphylaxis a shock is produced which in no respect differs from primary peptone shock. This is true not only of the general reaction, but also as regards those local reactions which are characteristic of the species, and extends even to the microscopical changes. Thus, in the guinea-pig the bronchial spasm; in the dog the swollen and highly congested liver; and in the rabbit the block in the cardio-pulmonary circulation are equally produced. It was also found by Dale and Laidlaw² that

the isolated virgin uterus of the guinea-pig, when placed in a bath containing a solution of Witte's peptone, responded by a contraction identical with that given by the sensitized uterus when bathed with the antigen. Hence it looks as though the toxic substance were identical in the two cases, the substance in the case of anaphylaxis being produced by lysis of the antigen by antibody and complement, and in the case of the peptone being more or less openly present.

But the matter is not so simple. Van Slyke and Whipple³ have demonstrated that when a toxic or subtoxic dose of proteose is introduced into the blood there is a great and rapid increase in autolysis of body protein. The non-protein nitrogen of the blood is increased by 40 per cent., chiefly blood urea nitrogen, though the amino and peptide nitrogens are also increased. The possibility is not excluded that "among the products of induced autolysis there may be toxic proteoses which add their effect to the injected or absorbed proteose." Hisanobu⁴ lately confirmed these results, and also obtained precisely similar but rather more intense changes in anaphylaxis. He concludes that the poison in both must be identical. It may be noted that support is given to the view that the poison may be a specialized product of tissue autolysis from the fact that the reaction can be induced by certain non-protein substances which can only be supposed to exert their effects through injury to the protein of the host. Certain inorganic colloids have very remarkable powers. Thus, colloidal silicic acid is capable of taking the place of immune body in the lysis of red blood cells by complement. The toxic body, if produced from the interaction of antigen and body protein, is related to the rapidity of the injection, as a similar amount of antigen slowly injected may be void. At a certain point cell oxidation may be suddenly paralysed and a product result of the type of histamine or muscarine. Some observers have regarded this poison as originating in the liver.

The view that there is a toxic substance common to anaphylaxis and peptone shock does not commend itself to Dale. In his recent Croonian Lecture⁵ he inclines to the view that these factors have a similar action because a change in the state of dispersal of the cell colloids is common to both, which, in the case of anaphylaxis, does not call for the intervention of a poison at all. No doubt such an aggregation might be produced in either case, and cause changes in surface action and osmotic pressure, together with a certain amount of depolarization of the cell membrane, but it is scarcely likely that such an excessively minute quantity of native protein would cause the extreme permeability which occurs in the endothelium of the blood capillaries, as in those of the liver in the dog, and other profound effects of the shock. Dale counters this with the statement that the antigen, when applied to the isolated anaphylactic uterus, acts in about ten seconds, and it is difficult, he says, to suppose that this time suffices for the elaboration of a poison. He also finds that the reaction is largely governed by a stereo-chemical relationship of antibody and antigen. But is not the very object of this configuration on the part of the antibody the rupture of the molecule?

Another consideration introduced by Dale is rather puzzling. The instructive fact is recorded that the serum of the immune animal is capable of conferring passive anaphylaxis even better than that of the anaphylactic animal, its efficiency being closely parallel to the intensity of its precipitating quality. It is found in immunity experiments that the anaphylactic antibody fluctuates with the precipitin, and the two may be identical. The resistance of the immune animal Dale considers to be due to abundance of antibody in the blood which uses up the antigen before it can reach the tissue cells, the shock being caused exclusively by the cellular reaction, as it can be produced in the isolated uterus of the immune animal. But it is admitted that the blood of the anaphylactic animal contains no precipitin, and the shock is attributed by Dale to the absence of antibodies from the blood which have migrated to the tissue cells. How, then, it may be asked, is this blood, deprived of antibody (and precipitin), capable of conferring passive anaphylaxis?

Contraction of an isolated muscular organ is only one element in a very extensive picture, and until some more convincing evidence is forthcoming, the anaphylactic shock and peptone shock may be regarded as produced by an identical toxic substance. Immunization by peptone

* This view was put forward by the writer in the JOURNAL in 1903 as "a defect of metabolism the burden of which comes to be thrown on the lungs."

therefore is applicable to cases in which the symptoms may be caused either by whole or split foreign protein. The milder cases of asthma are probably associated with the latter, clinical evidence for which has already been recorded, and one attack affords little or no protection. A good example of the same thing is afforded in the malarial paroxysm. In many of the severe cases of asthma no doubt a larger molecule operates which is antigenic, and is succeeded by a period of desensitization. In either case protection confers on the body fluids a resistance to the induced poison, when used either in small immunizing doses, or in one dose large enough to produce a definite reaction.

Non-specific immunization does not possess the independence of action which is the prerogative of the specific (in the bacteriological sense). Hence the necessity during treatment of a carefully regulated mode of life. This comprises strict moderation in diet, and, above all, abstinence from alcoholic stimulants, the avoidance of chills, the avoidance of any exercise entailing a marked degree of hyperpnoea, and of anything which raises the normal body temperature, as hot baths of any kind. The patient should go to bed early, and ought not to indulge in social or other excitements, or in changes of residence. After the treatment, preventive measures will naturally be thought of in relation to many of the cases. The protein poison has been found to pertain to the acidic portion of the molecule, and its effects are to some extent neutralized by the simultaneous introduction into the body of alkali. A course of mildly alkaline treatment by natural waters or otherwise from time to time may therefore prove of some service as a prophylactic.

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THE MYOCLONIC FORM OF EPIDEMIC ENCEPHALITIS.

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THE systematic and comparative study of many cases of encephalitis in the principal hospital in Milan enables us to state that besides the classical form of lethargic encephalitis, in which lethargy, fever, and ocular paralysis are the cardinal symptoms, other clinical varieties, less frequent and greatly different, are to be recognized. We can sometimes observe cases in which the symptoms are not lethargy, but excitement, delirium, and myoclonic contractions.

The two following cases are of this second or myoclonic type:

CASE I.

A girl, aged 19, entered the hospital on January 21st last. No hereditary antecedents; she had had influenza with bronchopneumonia in October, 1918, and typhoid fever in January, 1919. On January 17th she began to feel great pain in the muscles of the neck and shoulders, and a few days later she had fever and delirium.

The symptoms present were: Slight cyanosis of the face, injection of the ocular conjunctiva, irregular contractions of the hands, and delirium; the temperature was 38.2° C., the pulse 104, and the respirations were 25; arterial blood pressure 145 mm. (Riva-Rocci). No paralysis of the eyes nor of the cranial nerves. Pupil reflexes to light and to accommodation present and well maintained.* Cutaneous and tendon reflexes normal. A lumbar puncture gave the following result: Liquid perfectly clear, at almost normal pressure; albumin just noticeable; Nonne and Boveri's reactions negative; six lymphocytes per cubic millimetre (Cellule de Nageotte). Cultures from the blood and cerebro-spinal fluid gave negative results.

The patient remained in this condition for about ten days. On February 4th there appeared in the flexor muscles of the arm and of the hand and fingers on both sides, but mostly on the right side, short rhythmic contractions at the rate of 66 to 68 per minute. In the right thigh a contraction of the quadriceps was observed, which produced attempts at flexion of the hip. No sensory troubles were present. Two days later, to the above movements were added slight inspiratory contractions of the diaphragm, synchronizing with the contractions of the arm. These movements continued even during sleep. There was no lethargy. The pupillary reflexes to light

and to accommodation were always regular and no paralysis of the cranial nerves was demonstrable.

This is still the condition of the patient, who at present has pain in the arms.

CASE II.

A woman, aged 40, entered hospital on February 16th last. No hereditary antecedents; no history of influenza. On January 25th there had been great pain in the left arm and shoulder, passing to the right side and the abdominal wall. Shortly afterwards rapid and rhythmical muscular contractions appeared which convulsed the patient. There was delirium, with slight fever; no lethargy, no affection of ocular motion nor of sight.

On entering the hospital this woman, who was of average physical development and well nourished, presented a curious and striking symptom-complex. The right sterno-cleido-mastoid and trapezius muscles and the diaphragm exhibited rhythmic contractions, forty-eight per minute. She perspired freely, and was agitated and delirious. No paralysis of the ocular and cranial nerves. No symptoms in the lower limbs. All reflexes normal. Lumbar puncture gave clear liquid, with increased pressure; albumin 0.2 per cent. Nonne and Boveri's reactions negative; five elements per cubic millimetre (Cellule de Nageotte); temperature 37.8° to 38° C.

Five days later the contractions of the neck ceased; at the same time strong rhythmic contractions, which never for a moment left the patient, appeared in the abdominal wall. Synchronizing with the abdominal and diaphragmatic convulsions, the right thigh presented rhythmic contractions of the abductor muscles and sometimes of the sartorius. Such is the patient's condition at present. All these muscles are painful, as well as the back and the whole arm.

The striking symptom in these two cases was the presence of myoclonic movements, both rhythmic and partial, as though produced by an electric current.

We can therefore speak of a myoclonic type differing from the lethargic type, for a certain period of the disease at least. Thus, while waiting for etiological enlightenment we should speak of epidemic encephalitis in general, and should divide it into lethargic and myoclonic types according to the different symptoms noted.

This myoclonic form of encephalitis naturally leads us to ask whether we are in the presence of the disease described by Dubini,¹ and called by him "electric chorea." It has not been mentioned since his time (1840-1870). He presented to the seventh meeting of Italian scientists (1846) a memorandum describing a new disease of which he had studied 38 cases in a period of nine years. "It is," Dubini writes, "nearly always a fatal disease," characterized "by muscular contractions occurring at different intervals, but always identical in each case, as if produced by a repeated electric current. These convulsions affect at first a finger or limb (more frequently the right upper limb) or one-half of the face (the right) and in a few days invade the whole of that side of the body." Dubini added that, in addition to these rhythmic movements, convulsive attacks might occur two or three or even more times a day, giving way afterwards to paresis and paralysis. Dubini's description was followed by those of Frua,² Morganti,³ Pignacca,⁴ Stefanini,⁵ Behrend,⁶ and, later, Grocco,⁷ 1884.

However accurate were the observations made by these scientists in the middle of the last century, the limited pathological knowledge which then existed did not enable them fully to appreciate their significance; reading to-day all these memoranda, we see described under the name of Dubini's disease a great number of cases which could better be classed as typhoid or malarial fevers, or Jacksonian epilepsies. Apart from this question, it seems to us that Dubini's disease might be connected with the myoclonic form of epidemic encephalitis as we see it at present.

The difference of the symptoms seen in the lethargic and the myoclonic types suggests a different pathological localization of the virus. In the lethargic form the encephalitis is localized particularly in the regions of the cerebral peduncles and the locus niger. It is a question whether in the myoclonic type the centres of infection might not in different degrees and in a transitory manner be localized in the optic thalamus.

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* See P. Boveri, Société de Neurologie de Paris, March 4, 1920. It is there stated that in the lethargic form of encephalitis one of the first and most important signs is the paralysis of pupillary accommodation, while the reflex to light may be maintained.