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My Improved Method of the Prophylactic Treatment of Eclampsia

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INTRODUCTION.

IN view of the interest that has been lately taken in the subject of Eclampsia, notably at the British Congress of Obstetrics and Gynæcology, held at Liverpool last year, we thought it would be most interesting to our readers if we could obtain a paper from Professor Stroganoff on his latest method of treatment. The first thing was to discover whether Professor Stroganoff was still living, and to this purpose we communicated with some friends in Moscow, who, after enquiries in Petrograd, sent us Professor Stroganoff's address.

We then wrote a letter, which was translated into Russian, to Professor Stroganoff, who replied that he would be glad to send us a paper if it could be in that language. A reply having assured Professor Stroganoff that such a paper would be very welcome, it arrived in due course.

Madame Krougliakoff most kindly undertook the translation gratuitously, but as she is not a member of the medical profession certain difficulties arose which can readily be understood.

The Editor, with the assistance of Dr. Russell Andrews, has endeavoured to elucidate this translation. In some places the meaning could not be gathered until further possible translations of the Russian words were obtained. It was impossible to communicate with Professor Stroganoff again, in time for the issue of this number of the JOURNAL. An attempt has been made to render the translation intelligible with as little re-writing as possible. The construction of some of the sentences had to be altered completely, but in many cases it was thought best to leave the construction unaltered, although it might appear quaint and unusual to English readers, rather than to risk destroying the originality of the paper.

THE EDITOR.

The question of how best to treat Eclampsia has, at the present time a great scientific interest, moreover, from the practical point of view, it is also of great importance to all civilized countries. The mortality from this disease is very great, and as often the strongest women, who otherwise are in good health, suffer from eclampsia, it is very unprofitable for any nation not to attempt to eradicate it. Moreover, serious cases of eclampsia are very often complicated with puerperal sepsis, pulmonary disease, and mental disturbance. The mortality of the child is also very high, being one and a half to three times greater than that of the mother.

In Europe in 1913 there were about 14,000,000 confinements. According to Hammerschlag, the mortality in Prussia from eclampsia was 3.5 for each 10,000 cases of delivery. According to Büttner, in Mecklenburg-Schwerin, and Hazar, in Baden, five for each 10,000. David Hardie's statistics, from 1886 to 1905, for England and Wales, show 3.9, and for Queensland, 5.4 for each 10,000. Taking the average proportion as four to 10,000, we find that 5,600 mothers die every year in Europe, and as the mortality of the children is one and a half to three times greater than that of the mothers, this means a loss of at least 8,400 children.

Rickets states that in the United States 4,000 mothers and 40,000 children die every year from eclampsia. These 40,000 children, however, must include deaths from other causes than eclampsia, but, taking the death-rate of children at one and a half times more than the mothers, this means that 6,000 children die as a result of eclampsia.

We must conclude, therefore, that in Europe and the United States of America, considered together, 24,000 mothers and children die every year from eclampsia.

In a recent number of the *British Medical Journal* reference is made to the great number of deaths from eclampsia in New Zealand, and the same journal publishes very startling statistics for England, stating that the mortality from eclampsia from 1911 to 1922 was nearly 25 per cent.

Eden, a member of the London Committee lately appointed to deal with eclampsia, says: "It is impossible to avoid the conclusion that the majority of the fatal cases were over treated and that in a considerable number of cases excessive treatment must have been a contributory factor in bringing about the fatal results." And further on he says: "We regard the results set out in our Report as being profoundly unsatisfactory, and having, as we believe, cleared the ground by showing how much our methods have been at fault" It is not surprising, therefore, that Herbert Spencer says: "Eclampsia is one of the bugbears of the medical profession at the present time."

Coles Stricker reports that in the United States there were 7,500 cases of eclampsia, with a mortality of 53.5 per cent. Rickets reports, as I have mentioned above, 4,000 deaths every year. Such a terrible mortality can only be explained by the fact that a large number of these cases occurred in places where proper medical attention could not be obtained. Thus Büttner, of Mecklenburg-Schwerin, reports that the mortality from eclampsia is 28.33 per cent. when there is medical assistance, and 45.76 per cent. when this is not available.

Jacobs (Brussels) informs me that "eclampsie est en effet une terrible mangeuse d'existances et il serait heureux d'avoir contre elle des moyens de defence-efficace" (eclampsia is really a terrible destroyer of human beings, and it would be a happy boon to discover some means of real defence against it). In Russia, in some clinics, in which they do not apply the prophylactic method, the mortality reaches 36.8 per cent., and in some districts even 41 per cent.

This question becomes more interesting, because nearly 25 years ago I described my method of treating this disease. The method which I then gave showed a mortality of 1 to 2 per cent. in un-neglected cases, and in the last twelve years I have so much improved the method that I can with nearly absolute certainty save the mother and very much reduce the percentage mortality of the child. I first elaborated the prophylactic method in 1897.

The fundamental idea of my method is that the spasmodic fits play a pre-eminent part in the results of the disease, that the number of the fits must be decreased, and that every possible thing must be done to prevent their repetition, since every successive fit brings the patient nearer to death. At that time I thought eclampsia a contagious disease. I have since changed my mind as to its pathogenesis, but my opinion as to the fits remains unchanged. There is no doubt the greater the number of fits the greater will be the mortality.

The results from the Institute of Gynæcology and Obstetrics in Petrograd, Lichtenstein's Clinics in Leipzig, and Freund's Clinic in the Charité in Berlin in cases of eclampsia are as follows:—

	Deaths.	Mortality.
234 cases with 1 to 2 fits	2	4.7 per cent.
225 " " 3 " 5 "	29	12.9 " "
420 " " 6 and more fits	98	23.3 " "

Very many authors (among them Hastings Tweedy) report similar results. In 1899, in reporting 45 cases of eclampsia treated by my prophylactic method without any mortality, I wrote:—

"With the cessation of or diminution in the number of the

fits eclampsia should lose its malignancy on the supposition that the natural powers of self-defence in the maternal organism, when more favourable conditions are brought about, should be able to destroy the cause of the disease. The treatment I suggest will control the fits and allow time for the natural efforts of the body to split the toxins into some simpler product and thus render them innocuous. We must try by all possible means to prevent the repetition of the fits by giving drugs when we expect a fit or else at stated intervals. By these means we get the most excellent results."

According to Solomons' statement the Dublin method has the same aim.

In 1900, at the Paris Congress, and in 1902, in Rome, I reported 99 and 126 cases of eclampsia respectively, with a maternal mortality of 5 to 6 per cent. The only cases which died were those which were moribund before treatment or which suffered from some other illness.

In 1908 I reported 360 cases of eclampsia, with a maternal mortality of 6.6 per cent., and a foetal mortality ante-partum and intra-partum, not including the third stage of labour, of 21.6 per cent.

Analyzing the causes of death in the mothers, I came to the conclusion that they died either because the disease was too advanced before the patients came under treatment, or because of some other complication, or because my prophylactic method was insufficiently or incorrectly applied. I wish to emphasize most strongly the possibility of reducing the maternal mortality to 1 to 2 per cent.

Happening to visit Heidelberg in 1907, I attended the Clinic of Rosthorn, and there saw a very serious case of eclampsia supervening after the child had been born, the mother having 11 fits in nine and a half hours, with a pulse-rate of 150 and coma. Rosthorn asked me to try my method. I began the treatment 25 minutes after the last fit, with the result that the patient had no further fit, improved every hour, and in 10 hours regained consciousness and recovered.

In 1909 I was invited to go to Vienna to demonstrate my method in the University 2nd Clinic of Gynæcology and Obstetrics. Schauta and Piscacek, Directors of the University 1st and 3rd Clinics of Obstetrics and Gynæcology, also kindly handed over their patients to me for treatment. During the month I was there I treated a serious case, ante-partum, which had had six fits before I commenced the treatment. The patient had only one fit after the treatment commenced, and recovered, the child being alive,

The delivery took place in the second week after the attack of eclampsia, with no fits during the labour, and recovery of the mother. The seven months child was born dead.

A second very serious case I treated was in the Clinic of Schauta. The patient had had one child. In this attack she had four fits during one hour and ten minutes, ante-partum. Directly I began my treatment the fits ceased, she became much better and regained consciousness after eight hours. To my regret I then had to leave Vienna, and the patient was left in the care of the assistants. After two days, during the second stage of labour, the fits recommenced, but the patient was delivered with instruments, with the result that the mother and the child survived.

The same favourable results were obtained in three other cases of eclampsia treated by me in the Clinics of Bumm and Franz in Berlin in 1911. It was only after my work in Vienna that Leopold, in Dresden, for the first time in Germany began to apply my prophylactic method, with excellent results, for out of 50 cases of eclampsia only four died; that is, a mortality of 8 per cent., whereas previously his mortality was 19 per cent. *All* of these patients were admitted with other serious ailments. Out of these 50 patients, 17, *i.e.*, 34 per cent., had no fit from the moment the treatment began; 25, *i.e.*, 50 per cent., had 1 to 3 fits; and only eight patients, *i.e.*, 16 per cent., had more than three fits; nine women, *i.e.*, 18 per cent., had no fits for 12 hours before delivery, and seven of these no fits for 20 hours before. The majority of the children were born alive. The reduced mortality of the children was very marked, 18.6 per cent., whereas previously it had been 55 per cent.

Roth concludes his paper in the following words: "Diese Veröffentlichung war geplant, um der Behandlung der Eklampsie nach Stroganoff einen grösseren Freundeskreis zu erwerben." (This paper was written with the object of winning a larger circle of friends for Stroganoff's method of treatment of eclampsia.)

In the same year appeared the thesis of Kapter and Kronig, of the Freiburg Clinic, in which my prophylactic method is carefully analyzed, historical data are given, and the results of the treatment of five patients, which were very satisfactory, there being no maternal mortality and death of only one infant, on account of premature separation of the placenta. He recognizes the results attained "in jeder Hinsicht auffallend günstig" (in every respect extremely favourable), and as confirming my statement "Punkt für punkt."

Somewhat similar results were published in 1912 by Zöpritz, of Göttingen, in which he records six cases of eclampsia with no

maternal mortality, a very small number of fits and a reduced foetal mortality.

Kapferer is of opinion that eclampsia is of nervous origin, and Zöpritz regards it as being due to anaphylaxis.

In 1911 Zweifel began to apply my prophylactic method, together with venesection, in the Leipzig Clinic. The first 20 cases, with a mortality of 25 per cent., at first sight appear to be unfavourable, but most of the deaths were due to accidental causes. In the next 74 cases there were no deaths. He says :—

“ Wir wollen keine Abzüge machen, sondern des Vergleiches wegen immer die Gesamtmortalität anführen, doch aber auf die Tatsache hinweisen, dass 3 der Todesfälle leicht vermeidbaren Ursachen zuzuschreiben sind. Deswegen ist der Schluss berechtigt dass bei ihrer Vermeidung eine Gesamtmortalität von 2-3 per cent. als erreichbares Ziel der neuen Eklampsiebehandlung in Aussicht steht.” (“ We will make no deductions, but, in bringing forward the total mortality as the point for comparison, we must emphasize the fact that three of the fatal cases are to be ascribed to easily avoidable causes. The conclusion, therefore, is justifiable that by their avoidance a total mortality of 2.3 per cent. may be looked on as an attainable objective in the new treatment of eclampsia.”)

Therefore, my statement that it is possible to reduce the mortality to 2 per cent. in cases which have not been neglected was confirmed not only by my own observation, but also by Leopold and Zweifel and to a certain degree by Krönig and Zöpritz.

The numerous reports of Lichtenstein from the Leipzig Clinic show his preference for the prophylactic method and venesection rather than delivery by operation. Again, in 1913, he reports 94 cases, with five maternal deaths, 5.3 per cent., and a foetal mortality of 21.3 per cent., against a mortality of 36 per cent. when the active method was employed. He also points out the following advantages for the prophylactic treatment :—

- (1) No death of the mother could be put down to delayed treatment.
- (2) 62.8 per cent. of the labours terminated naturally, against a percentage of 22. There was only one case of vaginal Cæsarean section, and not one of abdominal Cæsarean section. In no case was the cervix dilated with Bossi's dilator, or incised, or torn, and in no case was the bladder damaged.
- (3) In 42 per cent. of ante-partum eclampsia the fits ceased twelve hours or more before delivery.
- (4) Only 2.1 per cent. of psychosis was observed, against 6.75 per cent. with active treatment.

Comparing his results with those of the active treatment of Freund, Lichtenstein gives great preference to the prophylactic method with venesection. His last report is based on 201 cases, with a maternal mortality of 8.5 per cent. At the same time he notes that during the war there were many neglected, that is, not treated, cases.

I must say that for the first fifteen years my prophylactic method did not find authoritative support because of theoretical considerations, and it was only from the time of my going to Vienna that my treatment began to be employed in Germany. Up to the present the following professors and their assistants have published favourable results:—Krönig, Paukow, Zweifel, Lichtenstein, Wertheim, Iaschke, Zöpritz, Walthard, Döderlein, Kerff, Barsony, and Winter.

Fraenkel, Thorn, Nagel, Skutsch, Opitz, Franke, Henckel, Martin, Zangenmeister, Strassmann, Schauta, Stockel, Franz, Sellheim, Seitz, Zung, etc., recommend the method and apply it in special cases.

My method is discussed in more than one hundred works, and in the majority very favourably. The prophylactic method is objected to only by those who see in it a disagreement from their point of view as to the origin of eclampsia, that is, because of theoretical considerations, or after having applied it in one or two cases without any system.

In examining the international literature, I came across only two authors—Bumm and Schmidt—who, after applying the prophylactic method in more than 10 cases, obtained worse results than with other methods. Out of 16 patients in Bumm's Clinic seven, or 43.7 per cent., died, and he ceased to follow the treatment any longer. I must mention, however, that two of these patients (6 and 9) died from sepsis; two, when they were admitted, had slight oedema of both lungs (3 and 5), and one was almost dead (11). It seems hardly fair to put these results down to the prophylactic method. No conclusion can be arrived at from these 16 cases, especially when we compare them with 800 cases from other clinics with exceedingly favourable results.

Not very long ago I sent an article to Bumm describing my improved prophylactic method and its results. In answer he informed me that he had again introduced my method in his clinic.

Schmidt reports 38 cases treated by my prophylactic method, with a mortality of 26.3 per cent.—his mortality when employing other methods was 23.5 per cent.—and says it would be fairer to exclude two cases which had Cæsarean section performed, and a fourth case as neglected. The ninth fatal case had a very great number of fits before treatment, whilst the

fourth fatal case, after the cessation of the fits, was treated with venesection and saline infusion, which, from my point of view, is prejudicial. The fifth case died from abscess in the lungs on the 15th day, and the sixth from broncho-pneumonia on the sixth day. Taking into consideration that these cases were serious, with unexpected complications, and the cause of death of some of the patients was not clear, yet in many cases the patients did well, I do not think that these results form an argument against the prophylactic method. It should be noted that the affection of the lung occurred in six out of 38 patients, septic change in other organs five out of 38, whilst in Russia only two fatal cases of pneumonia and one of sepsis occurred out of 230 cases.

Does this not show that the treatment was not carried out as it should have been in Schmidt's cases? Some support to this idea is shown in two cases (4 and 10) in which saline solution was infused, a method of treatment which I object to. I will expound the reason for this below.

One of the most ardent partisans of forced delivery was Winter, but at the present time even he recognizes that the treatment of serious cases by the prophylactic method and venesection is useful. Lichtenstein quite rightly says that such a method applied in the less serious cases is a triumph. The strongest opponent of my prophylactic method until recently was Freund, simply because of theoretical considerations, but since he began to apply the prophylactic method and venesection in his clinic in Berlin, a method which he calls: 'Taugt nicht,' 'Das unzuverlässigste,' 'Die irrationalste' ('Worthless,' 'The most unreliable,' 'The most irrational'), the maternal mortality has been much lower, 14.3 per cent., instead of 17.2 per cent. The mortality of the children, however, seems to be a little greater. In a preceding work of Freund's I noticed 19 statements partly contradictory, and partly without any foundation, and I refrained from criticizing the article. Lately he, like Winter, is inclined to favour the prophylactic method in conjunction with rapid delivery. In Austria this method is systematically applied in the clinics of Wertheim, and in Hungary in clinics of Barsony, all with good results.

In Sweden the method was applied by Perssan and Forssner. Forssner says that at the present time Stroganoff's method is becoming essential, if not the only one. In Holland it is recommended by Ribbins and Mingelen, in Switzerland by Herff.

Henry Zavato, of Buenos Aires, writes me that he has used my prophylactic method with great success, and considers it the best. In England, France and the United States the prophylactic method is recommended by such authors as Ballantyne, Kosmak,

Pfeifer, Williams, etc., for certain cases of eclampsia, but up to the present I regret to say that it has not received an extended trial.

PATHOGENESIS OF ECLAMPSIA.

Before considering the question of the treatment of eclampsia we must briefly examine the question of pathogenesis, which up to the present time has remained unsolved. The modern theories, as well as the ancient ones, are very little substantiated. The most probable theory is that of the placental origin of the disease. Thus Lubarsch, Schmorl, Kassianoff, etc., found syncytial cells in the veins of puerperal women suffering from eclampsia as well as in those of women in pregnancy and labour. These stray cells may play the part of an antigen, causing the formation of anti-bodies, or break up into new bodies which act, at a certain concentration, as toxins.

Huhl Rodenburg even states that in this case we get white corpuscles which produce a characteristic change in the liver, and at the same time, like other toxins, affect the kidneys.

Numerous investigations in Zweifel's clinics established the fact that the blood of women suffering from eclampsia is thicker than that in normal pregnancy or labour. Syncytial cells appearing in the veins of the mother make the blood thicker and probably more likely to form thrombi, which is one of the characteristic symptoms of the pathological-anatomical picture of eclampsia. In many clinics the fact was established that the blood of a woman suffering from eclampsia clots more easily. This fact is in absolute accord with my own observations, and was proved experimentally by Engelman and Ebeler.

Probably some other factors are also important, such as :—

- (1) Internal secretion of the mother as well as of the placenta.
- (2) Secretion of toxins from the fœtus and mother, the last fact being confirmed by the successful results of the Dublin method of treatment.
- (3) The change in the composition of the salts of the blood, the calcium being diminished and the sodium and potassium being increased, as shown by the investigations of Loeb.
- (4) Increased irritability of the nervous system.

In my opinion the sequence of events in eclampsia is the following. The toxins, formed in one way or another in the mother's blood, irritate the central nervous system, and particularly the vaso-motor centre. As a result of this irritation spasm of the blood-vessels occurs with a rapid increase of blood-pressure, following which headache, changes in the eyesight and hearing and epigastric pain supervene, the total result being an attack of

convulsions with loss of consciousness. The spasm of the blood-vessels of the kidneys causes a sharp change from oliguria to anuria and albumen and casts appear in the urine, and, after many fits, red corpuscles also. Probably there are also sudden changes in the function of the liver.

Eclampsia, therefore, is the result of a reciprocal action between two factors, the one the quality and quantity of the toxin circulating in the mother's blood, and the other the degree of irritability of her central nervous system; for, as we know, such irritability is enhanced in pregnancy (Blumreich and Zuntz).

It is a very interesting question as to how soon the syncytial masses entering the veins of the mother begin to exert their toxic action. The onset of eclampsia in from two to ten days after delivery seems to show the possibility of a prolonged state of quiescence without any toxic effect. In such cases may we not suppose that a part of the placenta was left in the uterus and, not very long before the fits began, syncytial cells escaped into the veins of the mother? Not very long ago, however, I had a patient who had two fits on the tenth day after her delivery, but had no sign of retained placenta. Similar conditions were observed in other patients on the second, third, and fourth days after delivery.

More convincing is a series of cases of eclampsia in which the uterus was removed after delivery (Vineberg, Sutugin, Zweifel). Zweifel had a patient who had eclampsia three and a half hours after extirpation of her ruptured uterus, and Vineberg had one who had eclampsia twelve hours after. These facts confirm the opinion that the syncytial cells in the veins of the mother do not give rise to toxin for some time.

We must try to diminish the quantity of toxins in the blood of the mother and lessen the irritability of her nervous system. Many consider immediate delivery as one of the methods of removing the toxins. This is probable, though not absolutely certain, because we really do not know when and in what circumstances these elements enter the mother's blood, neither do we know how long it takes before they begin to manifest their toxic action.

The fact that eclampsia appears more often during delivery seems to show that syncytial cells enter the blood during labour and that their toxicity is increased by the labour pains. The onset of fits, however, can be attributed not only to this toxic action, but also to the increased irritability of the nervous system due to the labour pains; moreover, the artificially aided delivery is often connected with increased pressure on the uterus, with manual extraction of the placenta, and with other manipulations. Do not all these encourage the pernicious elements to enter the blood, and is not the attack of eclampsia more severe because of this?

Only observations in clinics can decide this question. The results in the clinics of Leopold, Zweifel, Wertheim, Herff, and Wolthard, as well as those of English obstetricians communicated to the Liverpool Congress, speak quite definitely against the wide application of such operations as abdominal or vaginal Cæsarean section or manual forced delivery.

The toxicity of the blood can be diminished by giving the patient water, as the Dublin method advises, or saline infusion and milk in quantities 1000.0 cc. *per diem*, and, if the patient is conscious, as much weak tea as possible, in order to dilute the toxins and remove them more quickly, or by producing perspiration as we do in Russia, or by venesection, since, from our point of view, the toxins are chiefly in the blood.

Still more strongly can we act on the nervous system. Morphia is an excellent pain reliever, chloral-hydrate and chloroform quickly lower the consciousness and depress the vaso-motor centre, consequently their administration is thoroughly rational.

All pharmacologists and clinicians say the same, and for more than fifty years such treatment has been very general. Only Dührssen and his supporters object to these drugs, purely from theoretical considerations, maintaining that it is not rational to introduce new poisons into an already poisoned organism. Such a statement, as we know, is only fair in those cases in which the new poisons have the same deleterious effect on the tissues as the original ones, but not when they possess opposite characteristics, since then they are antidotes. Morphia and chloroform, and particularly chloral-hydrate, have just the opposite effect to the toxins of eclampsia, which produce spasm of the blood-vessels, convulsions and headache; while, on the contrary, chloral-hydrate and chloroform remove convulsions, produce dilatation of the blood-vessels, and lull the irritability of the nervous system. Morphia lowers the sensibility to pain, soothes labour pains, and so calms the nervous system. The application of these narcotics has one disadvantage, for eclampsia sometimes requires very large doses of narcotics, far surpassing the ordinary doses employed, and this is undoubtedly a weak spot in the treatment.

Only the results of observations in clinics can show what is useful and what is pernicious. The method of Veit, who recommended large doses of morphia, is bad; in 902 cases of eclampsia in Germany collected by him the mortality was 21.6 per cent. The same serious results followed the treatment by large doses of chloral-hydrate and the prolonged administration of chloroform, Perrochet giving a maternal mortality of 37 per cent.

Probably too large doses of these narcotics, without the addition of some other form of treatment does lead to very bad results.

The essential phenomenon of eclampsia is the appearance of toxins in the blood of a woman which cause spasm of her blood-vessels with a resulting increase of blood-pressure. The spasm can be observed not only by clinical observation, but also by a direct observation of the blood-pressure by the method of Lombard and Weiss. Hinselmann and Nevermann observed these spasms in small capillaries in connexion with the spasms of vessels which quickly diminished under the influence of venesection. The result of such spasms may be headache, deficient vision and hearing, changes in the urine, probably also changes in the function of the liver, and at last convulsions, with a loss of consciousness. Naturally, such spasms cause changes in the assimilation of food and in breathing.

The fits bring with them a new and very powerful factor which has a deleterious effect on a woman suffering from eclampsia. The fit lasts about a minute, during which respiration almost stops, and therefore all the cells of the organism suffer very much from asphyxia. At the same time, as a result of the severe contraction of nearly all the body-muscles, a great quantity of toxin is poured into the blood. The assimilating and the excretory activity of the kidneys and liver are lowered. The heart also is affected, and I have several times observed after a fit the contractions of the heart to be slow and stronger.

After a fit the respiration gradually recovers, and within two or three minutes the asphyxia disappears. All this shows that a fit has a very pernicious influence on the organism of the woman, and certainly hastens the fatal end. In some serious cases of eclampsia the fit has such an effect on the respiratory centre, that it ceases to work, and only artificial respiration can save the woman. Sometimes fits cause cerebral hæmorrhage, as a result of which death may take place. The blue swollen face during a fit makes one fear a fatal termination. The above-mentioned significance of the fits is supported by the following phenomena. After the first fit consciousness usually returns very quickly; after the second in from 10 to 30 minutes, and after the third or fourth not for hours. At the same time the quantity of urine is diminished, and the composition gets worse with every succeeding fit. The strong action of the heart before the fits becomes increasingly weaker after 10 to 14 fits, and symptoms of œdema of the lungs appear.

The statistics mentioned above also support the fatal significance of fits. It goes without saying that not only the number of fits but also their strength and frequency are important. As I have mentioned above, a strong fit can paralyze the respiratory centre and the heart, and frequent fits destroy the organism of the mother still more.

Besides, the health of the woman is of great importance, particularly the condition of her cardiac and vascular system. I have known œdema of the lungs appear after two fits, and sometimes after four fits the patient was nearly dead. One patient, after two fits, had symptoms of blood effusion in the brain.

In some cases, after 20 or more fits, the patient quickly recovered. One patient recovered after 40 to 50 fits. Cases are reported of recovery after 100 or even 200 fits, but these facts, from my point of view, do not change my contention that every succeeding fit brings the patient nearer to death. I absolutely agree with the statement of the London Committee at the Congress in Liverpool, that 10 fits are a symptom of danger.

In contradistinction to all this there are so-called cases of eclampsia without fits. These cases must be separated from eclampsism or pre-eclamptic toxæmia. Eclampsia without fits is very rare, and the majority of authors consider that a fatal result often follows. On the contrary, eclampsism is only a forerunner of eclampsia. As a rule it does not lead to death, but sometimes passes into eclampsia with all its consequences. At the present time eclampsia without fits seems to me very doubtful.

I cannot say that I have not observed among my patients one case of this sort, though in one case I first of all diagnosed it as eclampsia without fits, but after further observation I came to the conclusion that it was a case of cerebral hæmorrhage. During the last 25 years in the Gynæcological and Obstetric Society of Petrograd no undisputed case of this kind has been recorded. There were two or three fatal cases which would have been more correctly ascribed to icterus gravis, and others to uræmia or sepsis. At any rate, I cannot suggest how to treat such cases. It seems to me that one does not find in such cases the principal symptoms of eclampsia, spasm of the blood-vessels and increased blood-pressure. But we have observed several cases of eclampsism or pre-eclamptic toxæmia in Russia. Its symptoms were headache, dimness or even loss of sight, defective hearing, epigastric pain and vomiting, and, most important of all, increased blood-pressure. All these symptoms are forerunners of eclampsia caused by the same toxin; accordingly the treatment must be the same, but to a lesser degree. Rest in bed, a reduced diet, milk, and the administration of narcotics in small doses, as in the case of eclampsia, will, in the majority of cases, result in an amelioration of the symptoms; if, however, the condition remains *in statu quo* or becomes worse, if casts appear in the urine or there is an increase in the amount of albumen, the proper treatment is to induce labour by rupturing the bag of membranes and by giving medium doses of narcotics.

I did not observe any case of death from eclampsia, and by applying correct régime and treatment a good result may almost certainly be attained. For this reason I consider such an operation as Cæsarean section (Essenmüller) contraindicated. Certainly the cases treated by this operation must not be included in statistics of eclampsia, but must be separately dealt with. I have not included a single case of Cæsarean section in my statistics.

THE TREATMENT OF ECLAMPSIA.

Assuming that eclampsia is the result of the reciprocal action of two factors :

- (1) the appearance of toxins in the blood of a woman which act on the nervous system,
- (2) the reaction to them by the nervous system,

our treatment must be to lessen the toxins in the blood, and to diminish the irritability of the nervous system, but we cannot indicate any means of preventing the entrance of placental toxins as our knowledge in this direction is not enough. Forced delivery, as experience shows, does not answer the purpose. Zweifel, with this treatment, had 18 per cent. mortality of mothers and 37 per cent. of children, and he is of the opinion that favourable results are due not to the delivery, but to the hæmorrhage connected with the delivery, and in consequence he is a partisan of venesection. Bumm and Franz, in Berlin, had a maternal mortality of about 17 per cent., of which mortality 4.5 per cent. was due to operation. The results reported at the Liverpool Congress, June 1922, absolutely contraindicate forced delivery.

We must try to lessen the amount of toxins entering the mother's organism or else remove them altogether. For this purpose we must first try to stop the fits, since they are the cause of a great increase in the amount of toxins in the blood. Destruction of the toxins and their removal is very difficult because of the asphyxia and spasm of the blood-vessels. Moreover, it is desirable to liquify the blood and to lessen the formation of toxins in the intestines, and their elimination must be encouraged through the skin and kidneys. It is my opinion that many pregnant women, if not all, and women in labour, have such toxins in their blood, and are very well able to endure them; only if their accumulation is very great and the irritation of the nervous system is marked, will eclampsia appear. By stopping the fits we bring the woman to a condition nearly normal. The maternal organism continues to destroy or change the composition of the toxins and eliminates them.

The fundamental principal of my prophylactic method is to

prevent the re-appearance of the fits at all costs. Another important point of the method is the combined administration of morphia, chloral-hydrate and chloroform. Experience shows that by preventing the fits the patient improves every hour, and approaches the normal, and we can thus conclude that such a treatment removes the cause of the disease, or at any rate decreases its influence. The administration of the above-mentioned drugs calms the patient and leads to sleep, and at the same time prevents the spasm of the blood-vessels. By such means we diminish the formation of toxins, and, owing to the more normal circulation of the blood in the liver, kidneys, and brain as well as in other organs, the splitting up of toxins is helped.

As the concentration of the toxins is of such great importance, venesection and the introduction of liquid will be of benefit.

In carrying out the prophylactic method I do not consider it very important to empty the intestines, and lavage of the stomach was never done. Is it not fair to assume that the beneficial effect of the Dublin method is connected not with removal of contents from the digestive organs, but with introduction of considerable quantity of liquids?

In contrast with the Dublin method, I administer not only water, but milk also.

That eminent Russian clinician, S. P. Botkin, regarded milk as an excellent regulator of the nervous system, and recommended it in cases of wasting as well as in cases of adiposity. At the same time he considers that milk has considerable beneficial influence on the heart. I have myself observed the same result.

The salutary influence of milk in cases of kidney disease is well known. Such quantities of milk are so favourable in cases of eclampsia that I strongly recommend its administration from the first day of illness. 500.0 cc., with the same quantity of physiological solution of NaCl *per rectum* and *per os* with tea, having as its object the prevention and cessation of the fits, the arresting of the spasms of the blood-vessels, and the calming of the patient.

(1) **Removal of all sources of Irritation.**

I recommend the removal, if possible, of all sources of irritation from the patient, or reducing them to the minimum; therefore light, sound, manipulations, etc., should be avoided, as they help to cause the appearance of fits. For this purpose the patient's room must be darkened, all external and internal noises must be eliminated, the patient must be examined only if absolutely necessary, and then, as a rule, under chloroform; as also if the patient has to be catheterized or operated upon. Loud conversations, coughing, sneezing,

blowing the nose, creaking of shoes must not be allowed in the patient's room. The best time to make the bed is when the drugs have been given, or when the patient is under the influence of chloroform, or when she is restless and also immediately after a fit.

(2) Treatment of the fits.

To reduce the fits gradually, or if possible to prevent their recurrence altogether, I apply narcotics, morphine hydrochloride, chloral-hydrate, and chloroform, and I have found by experience that it is useful to employ these narcotics for cases of eclampsia of moderate severity, intra-partum, in the following order:— At the beginning of the treatment hypodermic injections of 0.015 gramme (0.01-0.02) morphine hydrochloride under chloroform.

In one hour's time: 2.0 grammes (1.5-2.5) chloral-hydrate in addition to 200-250.0 cc. of saline solution *per rectum*, and, when conscious, by mouth, with 100.0-110.0 cc. of milk.

In three hours' time from the beginning of treatment hypodermic injections of 0.015 gramme (0.009-0.02) morphia, usually under chloroform.

After seven hours from the beginning of treatment: 2.0 grammes (1.5-2.5) chloral-hydrate, as below.

After 13 hours from the beginning of treatment: 1.5 grammes (1.0-2.0) chloral-hydrate without chloroform if there have not been fits for 12 hours and there are no prodromata of them.

After 21 hours from the beginning of treatment: 1.5 grammes (1.0-2.0) chloral-hydrate without chloroform if there have not been fits for 12 hours and there are no prodromata of them.

Thus during one day the patient receives from 5.0 to 9.0 grammes of chloral-hydrate, and from 0.02 to 0.04 gramme of morphia under the skin and repeated administration of chloroform together with 500.0 cc. of milk and 500.0 cc. of saline solution. In exceptional cases, if the patients were very strong such quantities were given for 12 hours if the fits continued, or if there were symptoms of them.

In the majority of cases the failures were due to insufficient dosage at the beginning of treatment.

When the patient is admitted she is, as a rule, chloroformed for external and internal examination in order to ascertain the condition of pregnancy. At the same time the patient is prepared, morphia is injected, an enema, if necessary, is given; she is then taken to the operation room or to the lying-in room. If only a slight fit occurs after the patient is admitted, and if we are able to inject morphia five or ten minutes after the fit, then the patient is

only chloroformed during the first hour if the prodromata of a fit are noticed. We consider the following phenomena as forerunners of a fit: increase of the headache, as evidenced by the patient's complaints when conscious, or by the expression of her face, which is drawn and suffering, when she is unconscious; restlessness in bed, contraction of separate muscles or of their groups, and high blood-pressure.

The presence of these symptoms indicates that the narcotics should be increased, and chloroform is the quickest method of preventing a fit. As I have said, the above-mentioned narcotics are given in cases of eclampsia during labour. Ante-partum eclampsia requires the same quantity of narcotics or very often less. The post-partum cases of eclampsia are easier to treat, but even in these cases the fundamental principles must be carried out.

The fits must be prevented when the baby's head appears and then the body, for this certainly predisposes to the onset of a fit. Therefore, it is advisable, very soon after the delivery of the placenta, to administer the medium dose of chloroform—1.0-1.5 cc. This is given immediately after the uterus is well contracted and there is no reason to expect atonic hæmorrhage. The presence of symptoms of a fit requires more energetic application of narcotics.

We must, however, always take into consideration the condition of the heart and alter the dose of narcotics if necessary. The doctor must never lose sight of the general condition of the patient. But, anyhow, I have always noticed that 1-1.5 grammes of chloral-hydrate is less harmful to the heart and to the breathing centre of a woman suffering with eclampsia, than is a fit.

If an eclamptic patient has, as the result of treatment, been free from fits for more than 24 hours and has not yet been delivered, she should be given chloral-hydrate every eight hours. In the majority of cases such patients regain consciousness, and I recommend giving them a large drink of warm tea and also about a litre of milk, mixed with tea, during the day. Return of consciousness, perspiration, increasing quantity of urine, and fall in the blood-pressure are favourable symptoms, and permit smaller doses of narcotics. Prognosis is favourable if 12 hours at least, much more favourable if 24 hours have elapsed without a fit, as after that interval (24 hours) in only 3-4 per cent. of the cases do fits return during delivery. If they do return the dose of narcotics must be increased again. Only in exceptional cases do prodromata of fits appear after many days and we are obliged to give 3.0-4.5 grammes chloral-hydrate for such a long time. If the heart is weak I have tried, after giving a big dose of chloral-hydrate, to administer hedonal instead, but up to the present with no better result.

(3) Hastening delivery.

Hastening the delivery, by careful operations such as the use of the forceps or turning in order to extract by the breech, when such methods are not too dangerous for mother or child. Internal version in a primigravida is very often a serious operation for the mother, and more so for the child, and I employ it only in exceptionally serious cases. I consider de Ribes' bag harmful, as it brings in a new and permanent irritation, but its effect is rather indefinite.

Early rupture of the bag of membranes, if the diameter of the os has reached six centimetres in a primigravida and five in a multipara, is beneficial if there are no contra-indications.

The contractions of the uterus favour the regular circulation of the blood in the liver and kidneys, which is very important. It is possible that the absorption of the elements of the ovum after rupture of the bag of membranes is less.

Whilst recommending the application of careful operative delivery, I deem it necessary to note that during the last years I have carried out this method less frequently because my improved prophylactic method gives such good results; the fits stop so soon and the general condition of the patients improves so much, that if there are no prodromata of fits we can wait, and the delivery often finishes naturally. As a special indication for such deliveries is the likelihood of obtaining perfect asepsis.

(4) Improving the condition of the vital processes.

Try to keep the vital processes of the organism in better condition.

(a) Heart—by administering saline solution and milk, about 1000.0 cc. *per diem*. I usually introduce chloral-hydrate *per rectum*, and when the patient is conscious tea and milk by mouth. If the pulse-rate is 110 or higher (after numerous fits) we give digitalis and digalen, and when the pulse is very bad, camphor, caffen and other stimulants. Venesection, which liquifies the blood, lowers the blood-pressure and probably ameliorates the blood circulation in the heart, lungs and muscles, I find also useful for the heart.

(b) Lungs. Careful cleansing of the mouth and nose from mucus and blood after a fit; treatment of asphyxia by administering oxygen as quickly as possible after a fit; pure air, removal of all hindrances to the movements of the chest; placing the patient in the best position for the working of the lungs and heart. If the case is serious I generally put the patient on her right side, but I change her position in order to avoid hypostatic

pneumonia and to secure good expansion of both lungs. This is especially important when many fits have occurred.

(c) Regarding the kidneys and the skin—warm but light covering; hot water bottles, but not very hot, as patients suffering from eclampsia are much predisposed to burning. I particularly recommend the hot water bottles being placed in the region of the kidneys and the feet. It is desirable to induce a slight perspiration, which shows the cessation or diminution of the spasm of the blood-vessels, and at the same time helps the removal of toxins. Zweifel's opinion that the sweating is pernicious because it thickens the blood, is refuted by facts, as immediately after perspiration begins the patient quickly improves, and the fits appear rarely and only in case of violation of the before-mentioned treatment. Saline solution or tea should be given, as I said before. Ample warm clothing when conscious. Some authorities apply the saline solution by injecting it under the skin; I do not do this, as I think it is harmful. The salt is not good for patients suffering with their kidneys, and its subcutaneous introduction is dangerous from this point of view. These theoretical suppositions of mine are confirmed in some degree by the results in the Leipzig clinics. Lichtenstein, who employed such injections, warns us in his last article against many injections, which, he considered, caused evident harm.

It seems to be different when the introduction of the saline solution is per rectum, but we must recognize that there is an essential difference between the two forms of introduction.

Applying the prophylactic method, I administer milk with the saline solution, and it is introduced into the bowel from which the organism takes what it requires. Experience shows the complete harmlessness of such introduction.

If fits do not cease in spite of the above-mentioned treatment, I used to recommend forced delivery, but now I have changed my opinion. The reason for this I will explain in a more detailed way further on.

Such are the principles of my old prophylactic method which I still retain with some modifications. I have added to the above during the last eight to 12 years the following:—

(5) **Venesection.**

If fits recur about three times despite the employment of the above-mentioned treatment, then, if the patient cannot be delivered during the next two to four hours, I venesect her—400.0 cc. If the patient is admitted after many fits, seven or more, or if her case is serious, the venesection should be done at once. Zweifel, who recommends venesection 500.0 cc. together with my prophylactic

method, thinks that the venesection is the most important part of the treatment. This is certainly erroneous, as the prophylactic method gives the same result without venesection which Zweifel gets by applying the prophylactic method with venesection. Zweifel gives the mother's mortality as 8.5 per cent., whilst in 1908 mine was 6.6 per cent. Compare Leopold's 8 per cent., Walhard's 20 cases and Schnok's 15 cases without a death. Besides, I consider such indiscriminate use of venesection harmful as it can be the cause of death. As a matter of fact, in eclampsia there is a considerable weakening of the patient, and the loss of 500.0 cc. of blood cannot be ignored, if at the delivery the woman loses more blood, as the total loss may cause a fatal result. Moreover, the wound from the opened vein can be also the cause of death. Why should we apply venesection in such cases when the fits cease by the application of my prophylactic method alone (40 per cent.), or if there are one or two fits which only slightly weaken the patient, as often happens after a considerable dose of narcotics has been given?

Engelmann, who had 20 per cent. mortality with venesection, states in his last article, though not sufficiently in detail, the cases of death which, from my point of view, it seems happened in connexion with anæmia. Then it was established at the Liverpool Congress that the cases when venesection was applied had a large mortality (34.3 per cent., *Lancet*, August 1922). I have used venesection during the last 10 years only in 10 per cent. of cases, and my mortality is five times less than Zweifel (1.7:8.1). I must add that venesection was widely applied before, but never achieved results anywhere approaching mine regarding the mortality. All this clearly proves the erroneousness of the opinion of Zweifel. One German author says that at the present time the amount of hæmorrhage at delivery of 800.0 cc. must be counted as dangerous. Supposing that on an average a woman loses 300.0 cc. with the separation of the placenta, a woman suffering with eclampsia, on this assumption, is placed in a dangerous condition if by venesection she has already lost 500.0 cc. of blood.

I personally have observed good results only from moderate venesection, which I tried in about 20 cases, together with application of my prophylactic method. Usually during venesection the patient became calmer; her face shows less suffering, and its swelling diminishes. As a rule, too, I noticed the increase in the amount of urine, threatening œdema of the lungs diminished or totally disappeared; an inclination to cerebral hæmorrhage diminished, and the blood became more liquid and less viscous.

This explains, on the one hand, the lowered blood-pressure with re-entrance of œdema-fluid into vessels, and probably also the removal of a certain amount of toxins, as we suppose that they are

mostly in the blood; on the other hand, the effect of the cessation of the spasms of the capillaries on the spasm of the blood-vessels which was revealed by direct microscopic observations of the flowing blood in a woman suffering with eclampsia (Hinselmann, Nevermann).

Together with my prophylactic method venesection is useful because it contributes to more energetic absorption of narcotics from the intestines. The venesection to the extent of 500.0 cc. I performed only once on a very strong woman with a very serious attack of eclampsia and when the prophylactic method did not succeed. In some cases I removed 190.0 cc., 200.0 cc. and 300.0 cc. of blood until blood ceased to come—with great success. In 75 per cent. of these obstinate cases of eclampsia not one fit occurred after venesection.

(6) **Narcotics.**

Another point in my improved prophylactic method is the more energetic use of narcotics during the first hours of treatment. It is particularly important to prevent the fits during the first four or five hours; for this I introduce at the very first sign of the approach of prodromata of a fit, sooner than even mentioned in the scheme, chloral-hydrate or chloroform.

I regret I did not determine exactly what is the average quantity of chloroform to administer. Generally—a small dose after using a large quantity of morphia and chloral-hydrate—sleep comes very soon. The weaker the woman's heart is the more careful we must be with narcotics. In strong women I use 40.0 cc. during $12\frac{1}{2}$ hours.

I hesitate to support now the principle of forced delivery mentioned in my old prophylactic method. I used quite definitely to state that I hardly ever had reason to follow the treatment; for out of more than 800 cases of eclampsia I applied it only in a very few. I really included it originally in my treatment, because I was impressed, unduly, by its employment as a routine measure by others.

After Winter had recognized that the prophylactic method, together with blood-letting, gave better results in serious cases, after statements by many American doctors that there was a danger of shock in connexion with big operations (Cragin, Whitridge-Williams, Edward P. Davis, Harold C. Bailey), and after the report of the Liverpool Congress that results were so bad when vaginal and abdominal Cæsarean section were performed I renounced this method of forced delivery. At times it seemed to me that the only chance for the patient was a forced delivery, but I used to postpone it for some time, which always led to the benefit of the

patient. Such good results were more frequent than when forced delivery was practised. We can bring in support of this opinion a series of considerations from the theoretical point of view. From my point of view we should apply forced delivery only in serious cases, when all other measures have failed. What will be the resistance of the organism in such a condition? Certainly almost nil. Only patients with a strong heart and strong nervous system can endure abdominal or vaginal Cæsarean section or other obstetrical operations.

As a confirmation of this are the cases of two women suffering from eclampsia to whom I intended to apply the forced delivery; one had 32 fits and the other 20. They each had a fresh fit on the operating table, with which came paralysis of the heart, before the operation had begun. Even such exertion as being transferred on to the operation table and the preparations for the operation, together with the effects of the fit, were sufficient to cause cessation of the work of these weakened hearts. After the report of the Liverpool Congress I incline to the waiting method for such cases also.

Here let me add a few remarks on the fundamental points of my improved prophylactic method.

When a woman suffering from eclampsia is admitted it is our custom to give her chloroform, inject morphia, examine, and use the catheter. Usually we do not give a bath, but if the body is dirty the patient is rubbed with warm wet towels. We give an enema only if the rectum is loaded. We do not do this in every case for fear of introducing anything septic into the woman about to be delivered, and thus violating the aseptic condition in case of a possible operation. We do not wash out the stomach or the intestines. If we find a case suitable for operative delivery we transfer the patient under chloroform to the operation room, in the contrary case into the labour room. The room is darkened, all noise is eliminated, and the strictest observation of the patient is arranged for. We get ready all necessary medicines and instruments in case of a fit, and in case of necessity after a fit a rubber wedge or handle of a spoon, covered with towel or gauze, also oxygen, chloroform, etc. If prodromata of a fit appear, the patient is chloroformed for from five to 15 minutes; but if she is strong we hasten the giving of chloral-hydrate. It is important to give a sufficient quantity of narcotics during the first hours, then less will be required to be given during the following hours.

If the fits do not appear for a long time usually all conditions improve: headache is less, the consciousness clears, the quantity of urine increases, and the blood-pressure falls.

Cases of eclampsia before labour tend to be less severe than those occurring during labour; the post-partum cases of eclampsia still less severe. The cases of post-partum eclampsia require smaller doses than above mentioned, and if the cases are not serious and the fits do not appear during 8—12 hours, we can interrupt the introduction of narcotics. If post-partum cases are serious, we certainly apply the most energetic treatment—the fits must be stopped. If we notice prodromata of a fit we chloroform the patient. It is only harmful to do this during a fit. As a rule, during a fit the patient does not breathe, and consequently the covering of the mouth with a chloroform mask only hinders the entrance into the lungs of oxygen, which is the most important at the moment, and she cannot be chloroformed. But as soon as the fits cease we give oxygen to remove asphyxia. Only in exceptional cases, when the patient breathes during a fit, which occurs sometimes at the end of a fit, can we apply chloroform.

To prevent hypostatic pneumonia we keep turning the seriously ill patient from side to side, but we keep her longer on the right side in order to avoid pressing on the heart. The mouth must not be covered with bed-clothing or pillows, in order to allow the access of air more freely.

Formerly dry cupping was frequently applied when the lungs first commenced to become œdematous; nowadays, with the introduction of blood-letting, its application has nearly disappeared. The last means was mostly applied after cessation of the fits.

My treatment can be applied everywhere. Stempel described four cases of its application with full success in the house of a workman.

It is hardly possible to dispute the complete rationality of the above-mentioned principles, as far as we can judge with our knowledge of the pathogenesis of eclampsia.

The first principle—the possible removal of all irritations—will hardly be disputed by anybody.

The second principle—the administration of narcotics—is disputed by many. On the other side, still more have accepted it and continue to accept it, and its usefulness is proved by a great number of observations which amount to more than 2,200.

At the Liverpool Congress the unfavourable effect of morphia was noted, but the Committee mentioned only cases in which more than 0.03 gramme of morphia was given, whereas the improved prophylactic method administers this dose only in serious cases and when the patient is strong, 0.04 gramme *per diem*, and very rarely more. Probably the best means of treating eclampsia cases is by chloral-hydrate; the dose, 7.0 grammes and even 9.0 grammes *per diem*, is a big one, but the patient can very well stand it, as this

narcotic possesses the opposite properties to the toxins of eclampsia. It paralyzes the central nervous system and vaso-motor centre, lessens the irritability and stops convulsions—so this narcotic is a *physiological antagonist of the toxins of eclampsia*.

Chloroform acts in the same way and the combined administration of chloroform and chloral hydrate considerably augment their effect according to investigations of Prof. Kravkoff in Petrograd and Prof. Bürgi in Switzerland.

As to the other principles of the prophylactic method, it is hardly likely that any objections will be made after what I have already said.

The results of the treatment.

In 1918 I collected from the literature accessible to me 208 cases of eclampsia treated by my prophylactic method and variations of that method.

The mortality of mothers is 9.8 per cent., and of children 12 per cent. less than it was in the same establishments when other methods of treatment were applied. (See the table of results.)

The favourable results of German, Swedish, Dutch and other clinics have been pointed out before.

The results of my improved prophylactic method which until the year 1922 were not known out of Russia, are most interesting. As long as two years ago I stated that eclampsia can be absolutely cured, provided that the patients are not brought for treatment nearly dying, and until now I have not met even one case which would refute my thesis. In the Alexandro-Nevisky Hospital I have not met from August, 1910, any case of mortality from eclampsia with fits. There were 78 cases. In the State Institute of Obstetrics and Gynæcology, which is well known to many English doctors through the International Congress in 1910 in Petrograd, we observed 152 cases of eclampsia from the autumn of 1914 until September 1922. There were four fatal cases out of this number. One died in November 1918, two others in March and May 1919, the fourth in June 1922. So in the Institute we did not get any case of death during four years out of 88 cases of eclampsia. Summing up the results from the Alexandro-Nevisky Hospital and from the Institute, we received 166 cases, one after another, without mortality. The above-mentioned four fatal cases do not refute my thesis about absolute curing of eclampsia, if the cases were not neglected. Everyone can satisfy himself by the following data :—

The first fatal case (1068, November 24, 1918) was a patient who arrived at the Institute in a dying condition after 15 fits of eclampsia at her home, in a state of coma, with temperature 38.5°, pulse-rate 85, high tension (hard), the child dead. She had no fits

at all in the Institute, but died suddenly, four hours after her arrival. Cæsarean section was performed on the dead body, with extraction of two macerated fœtuses. At the post-mortem were found points of fresh hæmorrhage in the cerebral membranes and in the region of the central ganglia; the cavities of the third and fourth ventricles were filled with dark-coloured clots. Pneumonia lobularis incipiens. Hypoplasia aortæ. Hypertrophia, myofibrosis et dilatatio ventriculorum cordis. Hæmorrhagia multipl. hepatis. Degeneratio renum.

Second case (183, March 3, 1919). The patient was brought from the Hanen Lying-in Home to the Institute after 28 fits, nearly in a dying condition; temperature 39.9°, pulse-rate 120, respiration 36. As she had four fits in the Institute despite the treatment by narcotics and blood-letting, we decided to deliver her. The orifice was opened to the width of 1½ fingers. Before the operation she had the 33rd fit on the operation table with heart stoppage. Cæsarean section was performed on the dead body. The fœtus was dead. At the post-mortem the signs characteristic of eclampsia were found, besides swelling of the lungs and cerebral membranes. Degeneratio myocardii et renum. She had been only three hours in the Institute.

Third case (337, April 18, 1919). Not very serious eclampsia; four fits immediately interrupted by energetic application of the prophylactic method, without blood-letting. But from the second day her temperature rose, and she fell ill with influenzal pneumonia and sepsis. At that time the Spanish influenza raged in Petrograd. She died from these illnesses on May 4, 1919, on the 16th day after delivery and eclampsia.

From that time until June, 1922, we had not any cases of death out of 44 cases of eclampsia during three years.

Fourth case (1284, June 26, 1922). Arrived at the Institute after four fits at her home, in a condition of coma, with temperature 38°. Four years previously she was run over by a tram, and both her legs had been cut off in the lower third of thigh; recovery was very difficult. Probably her heart was seriously affected, as in the Institute, having only five fits, she died on the following day. But the most important fact in this case was that we could not apply the described method as we had no chloral-hydrate, and we were obliged to replace it by hedonal. Spontaneous delivery of a dead premature child of 2000.0 grammes weight. On her arrival at the Institute the heart was not examined. Post-mortem: Signs of eclampsia; heart muscle had a pallid, dull appearance as if it had been scalded with boiling water; the heart's cavities contained dark, not clotted, blood. The most probable explanation is that

the fatal end in this case was because of pre-existing degeneration and dilatation of the heart, which could not sustain nine fits.

Thus, *out of 230 cases of eclampsia in two establishments we had four fatal cases, i.e., 1.7 per cent. of mortality; we did not have one fatal case from eclampsia in applying the recommended method during eight years in one establishment and during 12 years in another establishment, except in neglected cases.* The results regarding the mortality of children are also most favourable. For all cases it is 12.5 per cent., but in cases of eclampsia post-partum and in the third stage, when our treatment could not influence the children, their mortality is 5 per cent.; while in cases of eclampsia ante-partum and intra-partum, except in the third stage, the mortality is 18.4 per cent. Out of this mortality, 6.5 per cent. of the foetuses were dead on admission; 7.3 per cent. died during delivery at the Institute, and 5.5 per cent. died after being delivered. Many children perished during delivery, not only from the operations, which were performed because of eclampsia, but also from such as (1) perforation, (2) embryotomy on account of contracted pelvis, (3) high forceps with umbilical cord three times twisted round the neck, and so on. In the after-delivery period some children perished from cold (the temperature was from 2° to 6° above freezing point in the establishment), from lues many abortive cases of the weight of 1,750.0 grammes. Only 5 per cent. can we ascribe to eclampsia and perhaps to the treatment, though among this 5 per cent. were some premature at 2,240.0 grammes and 2,600 grammes weight.

I do not think that any other method of treatment could give better results for children, with the exception of abdominal Cæsarean section. It is important to note that, despite reinforcement of the narcotic treatment, the mortality of children now diminishes with us. This shows that what is good for the mother is also beneficial for the foetus.

As a result we achieve not only a low mortality, but also an extremely small number of fits; 40 per cent. of the patients had not a single fit from the beginning of treatment; 45 per cent. had only 1—3 fits, and only 15 per cent. had more than three fits. The same results were achieved by Leopold, in Dresden, and Zweifel, in Leipzig. The largest number of fits out of 230 patients was 10, which we observed twice. Summing up the total number of fits observed by us from the beginning of treatment, and dividing this number by the number of cases of eclampsia, we find that the average number of fits after admission is 1.3.

Besides we observed about 30 per cent. of cases of eclampsia in which there were no fits during 12 hours and more before delivery. Often consciousness returned, the urine improved, and the general

condition of the patient became so much better that we sometimes did not hasten the delivery. Only two patients (0.8 per cent.) had inflammation of the lungs; one of them, above described, died, and two had intoxicational psychosis (0.8 per cent.) so slight that we did not even transfer them to the special hospital. Both patients recovered.

All this shows that *my improved prophylactic method of treatment of eclampsia seems to be the most useful, and from the results which have been obtained it approaches to Therapia Sterilisans Magna.*

Yet I hope to achieve still better results, if I can apply all the details of the method in the most perfect way, which to my regret is not always possible now.

As the mortality in all lying-in hospitals in Europe and America is enormous when other methods of treatment of eclampsia are applied and surpasses the mortality in Russia 10—25 times, and as the mortality in hospitals where the old prophylactic method is applied is considerably higher than ours, *the verification of the improved method on the widest scale seems to be insistently necessary.* Why allow a country to have 25 per cent. of mortality from the disease when it can be lowered to 1.7 per cent.? When some authors applying the prophylactic method do not achieve sufficiently good results this can be explained partly by modifications of the method, modifications which do not improve it but diminish its value, partly by not carrying out all details and perhaps by insufficiently complete and clear expounding of the method by myself. It is well known that a word is a pale image of a thought.

I sent a letter to the *British Medical Journal*, and by it to the British Medical Association, London Society of Obstetrics and Gynæcology, asking if they would not find it desirable to organize the experience of treatment of eclampsia by me in London on a wider scale than was done in Vienna and Berlin, *i.e.*, that not only two or three university clinics would give me their patients, but many hospitals, which would give me the possibility of treating 20—40 patients during two to four months. Then it would help considerably to show how far this method is effective on English soil, and on the other hand, the technique of the treatment could be demonstrated.

Regrettably in the *British Medical Journal* of July 15, 1922, were printed only extracts from my letter; and the essential part of the letter—my suggestion to the British Medical Association, London Society of Obstetrics and Gynæcology, National League of Health, Maternity and Children's Welfare, to organize the experience—was omitted. As in the extracts from the letter were

some inexactitudes, I asked the editor one more to put into the Journal the full contents of my letter.

Last August I sent the letter with the same request to the above-mentioned League and its President, but although two and a half months have elapsed I have not yet received any answer.

Only in New York and perhaps in large American towns is it still possible to meet the same numbers of eclampsia with the same serious course of it. There, as in London, probably, it would be possible to organize the experience in a perfect way. The opinion of Herbert Spencer that it is difficult to carry out in London the first principle of the method, shows how important it is to get acquainted with the technique of the method. From my point of view it is quite easy. Using the car and telephone, and having a midwife acquainted with the method, it is possible to treat patients simultaneously in different hospitals, or every patient could be brought in a special car to any hospital.

Such experience would have importance not only for England and her Colonies but for all civilized countries, so much more now that the improved method for the first time becomes known this year outside Russia.

At the beginning of 1922 I sent a criticism about the article of Dr. Ruge to Prof. Bumm for the *Archiv. für Gynäkol.*, with a brief description of this method. In June, by the wish of Dr. Kosmak, a detailed article about the method was sent to the *American Journal of Obstetrics and Gynæcology*, and in August to the *British Medical Journal*, both in the Russian language.

It would be very sad if the veracity of my opinion should be acknowledged by doctors only 15 to 25 years hence, as was the case with the prophylactic method. The future historian of Obstetrics, knowing this fact, would try to solve the question of how it could happen, in the age of steam-power and electricity, and with the general and medical press so highly developed, that such a condition of affairs could obtain.

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I. THE PROPHYLACTIC METHOD. UP TO 1918.

Authors.	Mortality.						The Sources.
	Mothers.			Children.			
	Number of Eclampsias.	Prophyl. Method.	Other Methods.	Prophyl. Method.	Other Methods.	%	
	%	%	%	%	%		
1 Primo	381	30 = 7.9	21.6	...	21.0	32.4	<i>Journ. of Akusherstva and Jensky Bol.</i> , May, June, October, 1913.
2 Stroganoff	-	3 = 3.75	22.2	...	6.9	-	In Lying-in Hospital of Krassovsky, from 1897 to 1912.
3 Stroganoff	-	6	0 = 0	...	-	-	<i>Russky Vrach</i> , 1911, No. 48.
4 Stroganoff	-	18	2 = 11.1	16.1	-	-	<i>Ibid.</i> , 1900, No. 38.
5 Lying-in Hospital in Tula	-	25	2 = 8.0	-	-	-	Was communicated to me personally by the Superintendent of the Hospital.
6 Mironoff	-	30	3 = 10.0	-	-	-	From Lying-in Home in Karkoff.
7 Sokoloff	-	49	5 = 10.2	-	-	-	From Morosoff's Lying-in Home in Moscow.
8 Lapides	-	77	6 = 7.7	-	26.8	-	The results reported at the third meeting of Russian obstetricians and gynaecologists in Kieff.
9 Vertel	-	24	2 = 8.3	-	-	-	<i>Journ. of Akusherstva, and Jensky Bol.</i> , 1907, p. 1073.
10 Primo	-	8	0 = 0	-	-	-	<i>Ibid.</i> , 1908 and 1909.
11 Selitsky	-	6	0 = 0	-	-	-	<i>Ibid.</i> , January 1915.
12 Novikoff	-	30	6 = 20.0	-	-	-	<i>Ibid.</i> , May and June 1912.
13 Walthar	-	20	0 = 0	-	-	-	<i>Munch. Med. Wochenschr.</i> , 1912, No. 33 (Lichtenstein).
14 Schnock	-	15	0 = 0	24.1	-	-	<i>Monatsschr. f. Geburtsh. u. Gyn.</i> 1915, Bd. 41.
15 Kapferer Clinics, Krönig	-	5	0 = 0	-	20.0	-	Dissertation, Freiburg, 1911.
16 Stempel	-	4	0 = 0	-	-	-	<i>Zeitschr. f. Geburtsh. u. Gyn.</i> , Bd. 73, Ht. 3.
17 Roth Clinics, Leopold	-	50	4 = 8.0	19.0	18.6	55.0	<i>Munch. Med. Wochenschr.</i> , 1911, No. 5.
18 Voigt's Clinic, Bumm	-	16	7 = 43.0	-	-	-	<i>Berl. Klin. Wochenschr.</i> , 1912, No. 37.
19 Eulenburg	-	1	0 = 0	-	-	-	<i>Monatsschr. f. Geburtsh. u. Gyn.</i> , February 1913.
20 Zöpitz	-	6	0 = 0	-	16.7	-	<i>Munch. Med. Wochenschr.</i> , 1912, No. 8.
21 Schmidt	-	38	10 = 26.3	23.5	-	-	<i>Zeitschr. f. Geburtsh. u. Gyn.</i> , Bd. 73, Ht. 2.
22 Wegner	-	32	4 = 12.5	-	-	-	<i>Med. Klin.</i> , 1913, No. 33.
23 Forsner	-	147	21 = 14.0	-	-	-	<i>Monatsschr. f. Geburtsh. u. Gyn.</i> , February 1914.
24 E. Zweifel	-	1	0 = 0	-	-	-	<i>Zentralb. f. Gynäk.</i> , 1914, No. 5.
25 Tamind	-	9	0 = 0	-	-	-	<i>Med. Observer</i> , 1912, iii, 78, p. 925.
26 Mingelen	-	37	5 = 13.5	-	-	-	Schmidt's <i>Jahrbuch</i> , 1916, Bd. 324, S. 55.
Total	-	1115	110 = 9.8	-	-	-	

II. THE PROPHYLACTIC METHOD + BLOOD-LETTING.

	82	0 = 0	21.6	...	10.9	32.4	Prof. Krassovsky's Home, 1912-1918; and Institute of Obstetrics and Gynecology, 1914-1918.
1 Stroganoff	-	-	-	...	-	-	
2 Lichtenstein	-	-	-	...	16.9	37.0	<i>Zentralb. f. Gynäk.</i> , 1917, No. 19.
3 Charité in Berlin	-	-	17.2	...	-	-	<i>Amer. Journ. of Obstet.</i> , 1915, p. 50.
4 Forsner	-	-	-	...	-	-	<i>Zentralb. f. Gynäk.</i> , 1917, No. 16.
5 Schiller Clinics, Winter	-	-	-	...	-	-	<i>Monatsschr. f. Geburtsh. u. Gyn.</i> , February 1913.
6 Barsony	-	-	29.0	...	-	-	<i>Zentralb. f. d. ges. Geburtsh. u. Gyn.</i> , Bd. 3, Ht. 3.
7 Eisenreich Clinics, Döderlein	-	-	17.0	...	23.0	26.7	<i>Monatsschr. f. Geburtsh. u. Gyn.</i> , Bd. 41, S. 452.
			to 34.9			to 38.3	
8 Scopova	-	-	-	...	-	-	<i>Cajopis Iakaruv ces Kych.</i> , 1913.
9 Righetá Clinics, Merffé	-	-	-	...	-	-	<i>Wiener klin. Rundschau</i> , Nos. 35-76.
10 Brandt	-	-	18.4	...	34.4	23.4	<i>Zentralb. f. Gynäk.</i> , 1917, No. 16.
Total	-	-	-	...	-	-	
	731	66 = 9.0	-	...	-	-	

III. VARIATIONS OF THE PROPHYLACTIC METHOD.

1 Engelmann	-	-	118	8 = 6.7	30.5	-	<i>Zentralb. f. Gynäk.</i> , 1916, No. 31.
2 Institute of Obstetrics and Gynecology from 1909 to 1914	-	-	188	22 = 11.7	21.6	-	32.4
3 Holsté	-	-	15	2 = 13.3	-	-	<i>Monatsschr. f. Geburtsh. u. Gyn.</i> , November 1912.
4 Righetá Clinics, Merffé	-	-	41	8 = 19.5	-	-	<i>Wiener klin. Rundschau</i> , Nos. 35-76.
Total	-	-	362	40 = 11.05	-	-	-
Altogether	-	-	2208	216 = 9.8	-	-	-