use of sounds to keep the passage open always in the future, you may take my word for it, this is not true.

External urethrotomy is the safest and most satisfactory one in cases of stricture of the bulbo-membranous or membranous urethra which are not amenable to gradual dilatation or in which the patient has serious constitutional disturbance during the course of dilatation. It allows better control of bleeding, and furnishes drainage of the bladder and for septic products, thereby preventing in greater measure their absorption from the open surfaces of the urethra than internal urethrotomy alone does in the cases of stricture of the character and locality mentioned above. It is a valuable adjunct to an internal urethrotomy in cases in which the stricture can be traversed with a guide beforehand, and which, therefore, admit of the combined operation being done in the manner described already. The risk of urinary fistula resulting from the operation is very slight if the catheter is not retained longer than two days. When chronic cystitis is present it is better to incur the risk of fistula by keeping the catheter longer in place, for the sake of the benefit that results from bladder drainage in those cases.

Divulsion is as safe but not safer than internal urethrotomy. With the exception of a few cases of early stricture it offers no prospect of permanent cure. It opens a free passage through the urethra at once, but does so in an indirect way, for the extent and direction of the splitting of the stricture is not in the control of the operator. It sometimes results in the formation of a mass of connective tissue larger and more dense than the original one, and consequently less amenable to treatment.

The treatment may be summarized briefly thus:
1. The meatus must be cut to a caliber 2 mm. larger than that of its normal urethra previous to properly carrying out any form of treatment.
2. Internal urethrotomy yields the most permanent results of any method, and for strictures of the anterior urethra, irrespective of their character, is the operation of choice.
3. All resilient, intractable, nondilatable and impassable strictures of the bulbo-membranous or membranous urethra are best treated by external perineal urethrotomy.
4. With the exception of these, all strictures so situated are best treated by gradual dilatation, unless, during its course, constitutional disturbances of importance arise, in which case it is safer to divide them at once by an external perineal urethrotomy.
5. Divulsion and electrolysis are not methods to be commended.

(During this exercise six students were given the opportunity to examine the urethra for stricture, and to pass sounds, and two assisted at the operation of combined internal and external perineal urethrotomy referred to in the text of the lecture.)

Original Articles.

SERUM DIAGNOSIS OF TUBERCULOSIS.*

BY DRS. ARLOING AND COURMONT, LYONS, FRANCE.

For several years our method of serum diagnosis of tuberculosis as practiced by us has been employed in most of the large scientific centers of Europe, but in America, although commonly employed by some writers, it does not seem to have been put to general practical use. Is this because of ignorance of the work of the Lyons physicians or of the difficulty of obtaining and maintaining the homogeneous cultures necessary for the agglutination reaction? This question we cannot answer.

However, it has seemed to us profitable to indicate here the actual status of this subject, so important for the diagnosis of tuberculosis, and to study briefly the history, the technique and the results of the serum diagnosis by the agglutination of homogeneous cultures.

I. THE HISTORICAL ASPECT OF THE SUBJECT.

In 1898 Arloing published a method of obtaining liquid homogeneous cultures of the bacillus of Koch, and was the first to show that these cultures could be agglutinated by the serum of tuberculous human beings or by animals rendered tuberculous, thus creating the serum diagnosis of tuberculosis.1

Certain improvements in obtaining and in the choice of homogeneous cultures 2 and chiefly the clinical application 3 and general significance of the serum reaction for tuberculosis have been studied by Arloing and Paul Courmont in numerous publications.

The serum diagnosis of tuberculosis in bovines has been further studied by Arloing.4

The variations in the agglutinating power of effusions and tuberculous effusions has been investigated by Paul Courmont and the result published in various articles.5

Since 1899 many authors have studied this subject, both in France and in foreign countries, and a certain number of points have for some time been established beyond all question. The following facts are admitted by all writers:
1. The bacillus of Koch can be cultivated in homogeneous fluid cultures. Certain experimenters, such as Baard (of Bordeaux), Bronstein (of Moscow), Carriere (of Lille), etc., have accomplished this result by starting with solid cultures different from ours. All those to whom we have sent our homogeneous cultures have maintained them easily.
2. These homogeneous cultures are very readily agglutinated in variable strengths by the serum of tuberculous human beings or of animals rendered tuberculous. Beck and Rabinowitch, with whom we disagree on other points, have recognized that it is possible to raise the natural agglutinating powers of the blood of an animal by inoculating it with tuberculosis.

* Translation of paper presented at the Section in Medicine of the Congress of Arts and Sciences at St. Louis, September, 1904.
As to the practical application and the clinical value of the tuberculous serum reaction opinions are divided in the following manner: Most authors confirm the results which we have obtained in every way. (Ferré, Mongour, Buard, Rothamel, in Bordeaux, Mosny and Ravaut in Paris. Carriere in Lille. Bendix and Romberg in Germany were the first writers who used this method with success.)

Bendix in Germany arrived at the same conclusions that we did concerning the frequency of the serum reaction in tuberculous cases and also demonstrated that the greatest intensity of this reaction occurred in the first and second period of the disease, and in consequence showed the value of serum diagnosis for the detection of incipient or even latent tuberculosis. The statistics of Romberg, based on ninety-five cases in which he arrived at the same results as ours, but by a different technique, is of great interest, and we shall speak of this later.

Some writers, confirming the essential points of the serum diagnosis of tuberculosis, make, however, certain reservations with regard to its applications, for the most part because they have not been able to base their statistics on a sufficient number of cases. (Frenkel of Halle, Knopf of New York, Ficker of Leipzig, Bronstein of Moscow.)

But since 1901 many scientists of various nationality have published works absolutely confirmative and based on a large number of cases. We can do no more than enumerate them here: In France, Dieulafoy of Paris, Clement, Weill and Desos, Desos and Froment of Lyons, Hawthorne of Marseilles, Rode and Logriffoul of Montpellier. In Germany, Rumpf and Guinard (in a publication in which they compare the results of serum diagnosis by our method and by that of Koch). In Russia, Kazarnov. In Italy, Ilenko, Margazalli and Lapareno, Marchetti and Heprnelli, etc.

Only a small number of writers have been able to obtain good results with the serum reaction: Beck and Rabinovitch, Nobele and Beyer, Ivanoff, De Grazia, Gebhardt, Ruitinger, Koch. We can only repeat here the criticism we have made in other places of these latter works, among others that of Beck and Rabinovitch. Certain authors have not been able to reach our conclusions because they have employed other technique than ours, for example, Koch. Others obtaining statistical results analogous to ours have not known how to interpret them on account of their unwillingness to admit the great frequency of tuberculosis in subjects non-tuberculous in appearance. Finally, certain authors have not followed in their technique the precautions which we have indicated.

It is remarkable, in any event, that it should be the great majority of authors who have confirmed our researches and that this confirmation should be more marked the greater the number of their cases and the more extensive their statistics.

II. The Technique for Investigating the Serum Reaction of Tuberculosis. Difficulties and Sources of Error.

The technique of maintaining homogeneous cultures for performing the serum reaction presents serious difficulties for the beginner because it requires care and precautions which are not necessary in the serum diagnosis of typhoid fever, for instance. It is this, without doubt, which has caused murmurings on the part of some experimenters, and the reservations which certain authors have made in regard to this subject, but these difficulties can easily be overcome with a little perseverance and some precautions, in a well-equipped laboratory.

1. The Principal Difficulties and Sources of Error.

These we have often indicated and we are now going to recapitulate the principal points. The sources of error in the application of serum diagnosis of tuberculosis are of two sorts, some arising from the nature of the malady itself, others from the properties of the cultures.

A. Sources of error arising from the localization and the evolution of the tuberculous process itself. — In certain diseases running a typical course, like typhoid fever, the clinical diagnosis can in most of the cases finally be made with certainty, and it is easy to compare the clinical findings with those of serum diagnosis. But in tuberculosis in which the foci are multiple and may require a long period for their development, — the disease presenting itself in the most varying aspects and which may be even compatible with an appearance of health, — the difficulties of clinical diagnosis are often great, especially at the beginning. Therefore, in many cases a serum diagnosis which is positive in proper dilution may be at variance with the clinical examination, especially when this has been superficial and points to an intercurrent disease without taking tuberculosis into special account; thus we have often seen the results of serum diagnosis confirmed by autopsy despite the fact that they were at variance with the clinical findings. It is for this reason that experimenters who perform the tuberculous serum reaction with the blood of cases in which they have not taken into account the complete clinical examination or the protocols of the autopsy cannot draw any valuable conclusions from their work. Some time ago we established the fact that certain cases of long standing tuberculosis (usually the sickest) may not give the serum reaction, and moreover that subjects who are really tuberculous but well in appearance may give a very positive reaction. On account of this apparent contradiction certain writers have come to erroneous conclusions with regard to the futility of serum diagnosis in tuberculosis.

In order to carry out profitable research on this subject one must be able, on the one hand, to study the serum reaction in the laboratory with all the essential precautions, and, on the other
hand, to establish a clinical diagnosis as completely as possible by means of all available resources. (Clinical examination, analysis of sputum, and the use of tuberculin, etc.) Really indisputable statistics should not be based on any cases except those where complete autopsy has been done, with anatomico-pathological and bacteriologic examination, when necessary. This was done by Arloing in bovine tuberculosis. As this is not always possible in human statistics, one must remember that only those cases in which the clinical diagnosis is positively established, should be used for comparison with the results obtained by the serum reaction.

B. Sources of error arising from the development of the cultures.—These sources of error have been expounded at considerable length in another paper of ours and have been further considered and even exaggerated by Ficker.

This author, as well as Romberg, also shows that the reasons for the inexplicable differences of opinion of some observers must be sought for in these sources of error, but they go too far in saying that the difficulties encountered render this procedure inapplicable, simply because certain investigators have not been able to overcome them.

These difficulties can be further summarized under three headings:

1. It is really a difficult and delicate procedure to transform an ordinary stock culture of the bacillus of Koch into a liquid homogeneous culture. This difficulty does not exist any longer since we are prepared to send liquid stock cultures of bacilli to any who ask for them. It is even preferable that investigators who wish to try this method should use the same bacilli which we employ.

2. The homogeneous cultures show a great variability in their aptitude for agglutination, owing to their varying richness in bacilli, conditions of their development, age, etc. By employing a technique always the same for the same observer these difficulties can be overcome. The employment of a test serum, and by the use of diluted cultures, most of these difficulties are avoided.

3. Since the agglutinating power is low with cultures from human tuberculous cases (it is rarely above 1 to 20), it is necessary to take into account slight variations in order to judge accurately the serum reaction. Concerning this last point we shall see farther along how this problem can be solved (the use of a standard serum and estimation of the reaction by the naked eye). It is certain beside that these last two points are sufficient to explain the divergent opinions of some writers. Among different observers some do not take sufficiently into account the precautions necessary to overcome the variations in the properties of the culture, or do not accurately estimate by the same method the degrees and the amount of agglutination, and, as a result, the conclusions of these writers differ from those who have followed the necessary conditions more strictly using a technique always the same.

2. HOW TO OBTAIN HOMOGENEOUS CULTURES OF THE BACCILUS OF KOCH IN LIQUID MEDIA.

This result is obtained by two procedures: In the first the object is to obtain a luxuriant growth of confluent colonies having a greasy and shining appearance on potato.

In the second these colonies are grown in liquid media (for details see S. Arloing Ac. des Sciences, 9 Mai 1898). To preserve the homogeneity of successive generations shaking the culture is necessary; this overcomes the tendency of the bacilli to grow in granules or in a scum. It should be borne in mind always, however, that this tendency diminishes as the successive generations become more numerous. We have even in time succeeded in making these bacilli grow easily in non-glycerinated bouillon. If these cultures are allowed to grow at rest some colonies will rise to the top and develop on the surface of the bouillon. In that event three layers of the culture can be distinguished: At the bottom a layer of bacilli isolated or clumped in granules, in the middle clear, transparent bouillon, and at the top a layer of bacilli forming a scum.

These homogeneous cultures have lost in part their power of retaining stains when acted upon by acids. The experimenter who uses these cultures should recognize the variability of their character in order that he may not be led into error, or take for impure cultures those in which the bacilli have lost a part of their classical properties. The return of these properties to the normal, by allowing them to grow for some time, should always be the criterion by which they should be judged.

Their resistance to decolorizing agents and their variation in virulence are not the only changes which occur, since their agglutinability varies also.

3. METHOD OF OBTAINING CULTURES THE MOST FAVORABLE FOR AGGLUTINATION.

The chief factor which renders serum diagnosis of tuberculosis more difficult than in other diseases is as follows:

The homogeneous cultures of the bacillus of Koch show a considerable variation in their aptitude for agglutination. This variability depends largely upon one point, namely, their richness in bacilli and in agglutinable material.

This richness in bacilli and in agglutinable material depends above all things upon the luxuriant development of the culture. The agglutinability, more or less great, varies with favorable and unfavorable conditions in the course of development; the older the cultures the more concentrated the cultures the more difficult they are to agglutinate, therefore it is necessary to use fresh cultures or slightly diluted old cultures. In order to estimate and measure the agglutinability of these cultures or their dilutions, a standard serum should be employed.

A. Conditions necessary for maintaining cultures.—The same conditions must always be observed: From 4% to 6% glycerinated bouillon
just neutralized must be used, the flasks must be shaken daily in order to maintain their homogeneity.\textsuperscript{43} An incubation temperature of 38° C. must be maintained. Flask cultures should be planted from thoroughly homogeneous stock cultures about one month old. The constant use of the same technique is essential.

B. Dilution of the cultures. — Young cultures of a few days’ growth can be used but we actually prefer old cultures diluted. A well-developed culture of one month’s growth should be chosen and removed from the incubator. The necessary quantities are taken and diluted with salt solution, 8\%, until the mixture becomes slightly milky, like a solution of glycogen. With a little practice the desired dilution is obtained, and each time tested with the standard serum; this diluted culture is used directly for the serum diagnosis.

C. Method for using the standard serum. — In order to estimate the agglutinability of the young or diluted culture, use is made of human or animal serum in which the agglutinating power has been determined. The culture, or diluted culture, should not be used unless agglutinated at the exact strength determined by this test serum.

D. Methods of preserving cultures for dilution and the standard serum. — Once those cultures intended for dilution have been removed from the incubator they should be kept in a dark, cold place,\textsuperscript{44} at a temperature below 10° C. if possible. This is the best method of keeping them. In this manner the cultures can be used for dilution over a period of three or four weeks. The standard serum retains its power for several months if it is kept at an even, cold temperature and in the dark.

These improvements in the technique, and especially in the use of diluted cultures, render the method more practical than at the beginning of our researches. Thus a small quantity of a month-old culture can be used by diluting it for several hundred serum reactions, since each one only requires two or three cubic centimetres of diluted culture.

4. THE TECHNIQUE OF THE SERUM DIAGNOSIS.

We can only repeat here what we have so often said before, and we will only recall the following points:

A. The serum of the patient (obtained by prickling the thumb and catching the blood in a tube) should be fresh, clear and sufficient in amount (about half to one cc. of serum).

B. The culture is diluted as we have described and tested with the standard serum.

C. The serum agglutination reaction is then performed with the suspected serum in the same manner as for typhoid fever; but the proportions of the diluted culture and serum are 1 to 5, 1 to 10, and 1 to 15, and higher if necessary.

D. The agglutination should be observed with the naked eye in the first three to five hours and only positive results should be noted in tubes, which show complete agglutination easily visible to the naked eye, and showing flocculi and subsequent clarification.\textsuperscript{45}

E. Comparison of the results obtained is then made with the results shown with the standard serum. The reaction can be considered positive only when the suspected serum shows an agglutinating power greater than that obtained with the normal serum of the kind of animal under consideration (in man at 1 to 5). The agglutinating power of the serum of tuberculous human beings is rarely very great. By our method it varies between 1 to 5 and 1 to 20 or 30.

III. RESULTS AND CONCLUSIONS.

The results of the serum diagnosis of tuberculosis are not based alone upon our personal work but on that of the numerous writers which we have quoted. Here in brief are the results:

In tuberculous human beings the serum has a similar reaction to certain animals rendered tuberculous, for instance, guinea pigs. Its agglutinating power rarely rises above 1 to 20, never to the higher degree which we have shown exists in the dog. Generally it fluctuates about 1 to 10, and in order to estimate it accurately it is necessary to follow the precautions which we have indicated.

1. THE AGGLUTINATING POWER OF HUMAN BLOOD SERUM.

A. In the so-called medical cases of tuberculosis we have studied the serum in more than four hundred cases, taken principally by chance from the service of Professor Bondet and Professor Tesserat at the Hotel Dieu in Lyons. These are the results:

In clinical cases of tuberculosis: Positive reactions, 87.9\%, negative reactions 12.1\%. In cases not clinically tuberculous: Positive reactions 34.6\%, negative reactions 65.4\%. In subjects well in appearance: Positive reactions 26.8\%, negative reactions 73.2\%.

If comparison is made of the figures of the positive reactions in these three classes it is seen that the percentage gradually diminishes in going from the tuberculous cases (87.9\%) to hospital cases in general (34.6\%), and finally is least in healthy subjects (26.8\%). This corresponds with what is known of this last class of cases with regard to the frequency of tuberculosis in individuals of non-tuberculous appearance.

In the tuberculous class we have chosen those cases differing most widely regarding localization (lung pleura, peritonenum, intestines, glands, etc.), and regarding severity (all the way from phthisis with cavity, galloping phthisis, caseous pneumonias, to benign pleuriases and discrete lesions of the spine). For a long time we have noted that the severe cases of tuberculosis nearly all gave negative reactions, and on the other hand the discrete and curable cases nearly always gave a positive serum reaction. Mongour, Buad, Rothamel in 1899, Bendix and Romberg have absolutely confirmed and emphasized this point.\textsuperscript{46}

Among the patients not clinically tuberculous we have been able to discover by means of the serum reaction a large proportion of latent tuberculous cases; this should not surprise us. The
autopsies have often enabled us to confirm the findings of a serum diagnosis which during the life of the patient disagreed with the clinical diagnosis as to the apparent disease.47

The inferences to be drawn from Romberg's statistics agree absolutely with ours.48 As to whether a positive serum reaction can exist where there are no apparent tuberculous lesions judgment must be reserved since it is certain that a former tuberculous infection, due to recently healed lesions, or even very small lesions that have escaped detection, or even latent bacillary tuberculosis, may explain such an hypothesis.49

In regard to the subjects of healthy appearance, the low frequency of a positive serum reaction is again in accordance with the frequency of latent tuberculosis in these cases.

B. In the so-called cases of surgical tuberculosis a study of the patients taken by chance and reported in the thesis of Clement 50 has led us to the following conclusions:

In the non-tuberculous cases the reaction has always been negative. In the tuberculous cases the serum reaction has been positive in the following proportion: 76.6% in the cases where the lesions were osteo-arthritis; 75% in the cases where the lesions were purely osseous, and 70.6% in varying tuberculous lesions.

2. THE AGGLUTINATING POWER OF SEROUS TUBERCULOUS FLUIDS.

The general method has been extended by me to the diagnosis of the nature of pathological effusions, by investigating the agglutinating power not only of the blood serum but of the pathological serous fluids themselves.

All the details for the application and the results obtained from a study of 135 serous effusions, tuberculous and non, in men and animals, will be found in a recent work.51

The agglutinating power is always absent in non-tuberculous effusions, and it is nearly always present, and often in marked degree, in tuberculous pleurisy and in benign tuberculosis peritonitis; it may be absent in cases of severe tuberculosis (purulent pleurisy and miliary pleurisy, peritonitis, meningitis, etc.). The demonstration of the agglutinating power of a pleural fluid is of great value in the diagnosis of tuberculosis.

3. THE CAUSES WHICH BRING ABOUT A MODIFICATION OF THE AGGLUTINATING POWER IN TUBERCULOUS CASES.

We have already seen that the grave cases of tuberculosis have often none, or at best, a very feeble agglutinating power. It is known that analogous instances are encountered in the use of tuberculin as a diagnostic measure; bovines affected with very advanced tuberculosis react very poorly to tuberculin. In order to discover the cause of this fact we have tested numerous animals with regard to the agglutinating power of their serum before and after inoculation with cultures, some of which were very virulent and some much attenuated. These experiments are recorded in our writings.52

Our general conclusions were as follows:

The agglutination in these experiments seems to be modified by two factors:

1. The virulence of the "tuberculizing" agent.

2. The susceptibility of the species of animal to tuberculosis.

The development of the agglutinating power in an individual seems to require that this individual shall resist to the greatest possible extent the tuberculous infection. Resistance will be offered under two conditions: when the organism naturally offers a poor medium for the proper evolution of the tuberculous process or when offering a favorable soil it receives an attenuated virus. Without doubt it is possible for other conditions to influence the variations in the agglutinating power of the serum in tuberculous men and animals, but we believe that the preceding conditions are of the greatest importance. It is not necessary to dwell upon the inferences to be drawn from these facts which explain the cases of negative serum reaction in man and which may have some importance in regard to the prognosis in different forms of human tuberculosis.53

4. THE SERUM REACTION AT DIFFERENT AGES.

We have investigated the influences which the age of the patient has upon the frequency of positive serum reactions in healthy and tuberculous persons. Romberg and Descos 54 have studied the serum reaction in children; Froment,55 in the aged. The conclusions which have been drawn from our observations and those of these writers are as follows:

A. Serum of the new born is never agglutinated, even when the patient is born of a tuberculous mother. (The new born themselves are very rarely tuberculous.)

B. As the infant advances in age the serum reaction increases in frequency as well as degree: thus, from five to ten years of age, children show a power of agglutination which increases with the age, thus it is possible to discover advanced or latent tuberculosis.56

The adult serum gives the reaction most frequently and the greatest degree of agglutinating power (see our statistics), whether it concerns clinical tuberculosis manifest or latent. It is seen, then, that the frequency of positive serum reactions increases with age up to the maximum age for adults. With the increase in age there is a corresponding chance of tuberculous infection with which the above increased frequency of the serum reaction corresponds. This point is well shown in the works of Naegel in Germany. The results obtained by means of the tuberculin reaction are the same and absolutely identical with ours.57

D. In the aged the frequency of positive serum reactions is diminished, for at this age the tuberculous lesions should have been healed for some time or would have carried off, long before, the subjects attacked. When the serum reaction is
plainly positive in the adult it indicates an active tuberculous process.

Nothing is more interesting than the evolution of the serum reaction considered from the standpoint of patients of different ages. It corresponds exactly with what is known of tuberculosis latent or evident at the different periods of life. The different methods control and confirm each other.

GENERAL CONCLUSIONS.

We can, at present, thanks to our general statistics and experiments, or confirmative observations, made by numerous writers, repeat with more confidence than ever the following general conclusions and clinical applications:

First: The use of homogeneous glycerinated-bouillion cultures of the bacillus of human tuberculosis has enabled us to investigate the agglutinating power of fluids and especially the serum of tuberculous patients, and thus establish the serum-diagnosis of tuberculosis.

Second: The advantages of the method are those of serum diagnosis in general:

1. Absolute harmlessness, since all that is necessary is to withdraw a few drops of blood or remove a little serous fluid, and it can be applied in all cases, whether febrile or not, whether seriously or slightly sick.

2. Ease and rapidity, since it is not necessary to have the patient under observation, and it requires only a few hours for its accomplishment.

3. The delicacy of the reaction in cases where the lesions are discrete or latent and difficult to recognize by the usual methods.

It is true that the details of the technique for maintaining suitable fluid cultures and the performance of serum diagnosis require that fairly exact and indispensable conditions should be followed, on account of the slight degree of agglutinating power of the serum from cases of human tuberculosis.

Third: In the cases of slightly advanced pulmonary tuberculosis the agglutinating power of the serum is nearly always constant, but in varying degree. It varies from 1 to 5 to 1 to 20 and more.

In advanced cases with very extensive or virulent lesions the serum reaction is often absent or very slight. It may also diminish in intensity and disappear as the disease becomes progressively worse. The experimental data confirm those of the clinic. The agglutinative reaction in tuberculous subjects appears most often and within certain limits in inverse ratio to the gravity of the infection and the extent of the lesions.

Fourth: In cases suffering from other diverse diseases and in which the clinical data does not reveal positive signs of tuberculosis the serum reaction enables us to discover a large number of cases of latent tuberculosis. Autopsy or further development of the disease frequently confirms serum diagnosis.

Fifth: Likewise with persons apparently healthy the reaction, so frequently absent, is positive in a certain number of cases, in a proportion corresponding to that of the known frequency of latent tuberculosis.

Sixth: Its value in practical use:

1. A positive serum reaction in the case of a suspected subject is a diagnostic point of great value in establishing the existence of visceral tuberculosis still active or having become inactive recently.

2. A negative serum reaction will have less value as a negative sign since agglutination is absent in a certain number of tuberculous cases.

3. But the absence of the serum reaction in cases of advanced tuberculosis, where serum diagnosis is no longer necessary, may in certain cases confirm an unfavorable prognosis. But on the contrary in the case of a patient suspected of tuberculosis, in the absence of clinical signs and symptoms of importance, the absence of the reaction may be of great value in helping to eliminate this disease. The same conclusions are applicable to serous pleural effusions.

It goes without saying that agglutination by the blood serum does not point out the locality of the tuberculous infection, but it is the place of the clinician to make use of the findings of the laboratory.

Seventh: In conclusion it seems to us that the serum reaction constitutes a rapid procedure, inoffensive to the patient and of great value for the early diagnosis of tuberculosis, especially in patients suspected of having early pulmonary lesions.

REFERENCES.


Gebhardt: Séro-diagnostic de la Tuberculose chirurgicale. These de Lyon, 1900.


Marchetti and Hepurnelli: Séro-réaction Tuberculose. Journal de Physiol. et Pathol. gen., No. 1, 1903.


Jour. de la societe med. des hop. de Lyon. 5, No. 1, 1904.


S. Arloing: loc. cit.

Voir: Gazette des hôp., de Decembre, 1900.

Ficker: loc. cit.

Our bactérius is only slightly virulent; it may, however, cause mecteriosis tuberculosis in rabbits when injected into the peritoneal cavity. It may cause generalized tuberculosises in guinea pigs at times.

The principles that we uphold will, we trust, allow us to come to some solution regarding medical liability in the case of the living child, and faithful to the title of this paper we will consider the aspects of the case as it has appeared in France. One of the greatest authorities on obstetrics, Professor Pinard of Paris, thus poses the question in a clinical lecture that he delivered five years ago, as follows: A woman in labor cannot be spontaneously delivered on account of a contracted pelvis; the child is living and at term. The operation that the physician judges both necessary and indispensable is objected to by either the patient herself or her family and another interference is imposed upon the physician and this intervention implicates the death of the child. Under these circumstances the physician has only the choice between embryo-tomy on the living child, a most detestable and scientific operation, and the Cesarean operation, which at the present time has a very small mortality for the mother, and only a slight one for the child. Opinions differ as far as medical doctrine is concerned. Noegelé and Caseaux admitted that one had no right to perform the Cesarean operation on a woman without her consent, and that if a sacrifice was to be made at all, it was