because discovery of important elements for appreciation of certain crimes which are peculiar or unusual in their nature can be made by men who have had a special experience in psychologic analysis. Examination of these cases must be made not only in relation to the circumstances which preceded, accompanied or followed a certain lawless act, but also and particularly in relation to the entire previous and present medical history of the individual himself in all its minutest details, as they all are important in appreciation of his mental make-up. Every clinician is well aware of the importance of all these details. Reliance on one clinical element at the exclusion of all others is contrary to the scientific spirit. Adherence to such a procedure must invariably lead to errors, and this is especially observable in cases in which mental operations are involved. The law that holds a person accountable for his acts only on the basis of discrimination between right and wrong is wholly inadequate, because it is not based on accurate data gathered from clinical experience. The jurist must cooperate with and, I should say, almost entirely rely on the alienist. But the latter must be given the greatest latitude in presenting all the details concerning the medical history of a given case. Under no consideration should he be restricted to limit his opinion as to the exclusive right-and-wrong test. If the expert is ordered to confine himself exclusively to the determination of whether the accused individual is capable of distinguish legally right from wrong, he is then forced to omit extremely important facts which, as we have seen above, constitute sometimes real elements of alienation. Thus a lunatic, in the proper medical sense of the word, will be condemned while in a state of irresponsibility.

Personal experience in the courts of Pennsylvania has convinced me that this test is very strongly adhered to in the majority of instances. In view of our present knowledge of normal and pathologic processes in the psychic sphere, in view of our experience in the manner and methods of the proper appreciation of abnormal mental operations, in view of the evident injustice that may be done to some individuals who are rather subjects for treatment in hospitals than to be placed in prisons and considered as criminals—for all these reasons I believe a revision of the old classical test of right and wrong is strongly required. A combined effort of medical and legal experts must be made for mutual enlightenment on this important subject and avoidance of the repetition of grave errors of the past will thus be accomplished. Human liberty and responsibility are two most serious elements of life that can not be dealt with in a purely technical manner. They must be viewed from the standpoint of the broadest principles governing the interrelation between the individual and the community.

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ABSTRACT OF DISCUSSION

DR. CHARLES W. HITCHCOCK, Detroit: I had occasion during the past year to review the laws of a number of our states regarding the matter of mental responsibility and in the ultimate analysis it seems to me that a great loophole is afforded to the insanity defense by the breadth of the laws, which almost uniformly permit any proof of insanity as an adequate defense for crime, instead of going further and inquiring not only whether the prisoner is insane, but whether he is so insane as to be irresponsible for his act, and is his act in any way the direct fruit of his insanity, if that be proved.

DR. A. C. BRUSH, Brooklyn: The question of impulsive acts in insanity is one of grave social importance. It is held in the laws of the state of New York, 157 N. Y., by Justice O'Brien,

that, although there may be such a form of insanity recognized, that the patient knows the nature of his act and deplores and fears its consequences, yet he is impelled by an impulse over which he has no control to perform the prohibited act. Whatever authority there may be in medicine there is none in law, and that is a wise decision from a sociologic standpoint; otherwise any prisoner might claim that he had an irresistible impulse to commit crime, and consequently society would be at the mercy of the criminal. It is not the fault of law, but the fault of medicine primarily. So long as we can not define insanity, can not define a dividing line between the sane and the insane, for there is none, the law must have some standard to set up for the defense of criminal cases, and that standard is still the old wild beast theory, and it must remain so until medicine evolves some more modern standard. Lawyers and judges are perfectly willing to accept any new standard if we can furnish it; but as yet we have failed, and until that is done, until we ourselves can evolve some more carefully and clearly defined rule, the present one must prevail.

THE STABILITY OF TYPE OF THE TUBERCLE BACILLUS

A STUDY OF THE TYPE OF CULTURES FROM OLD CUTANEOUS TUBERCLES OF BUTCHERS *

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It is now generally conceded that the tubercle bacillus of cattle at times incites tuberculosis in man. This conclusion has been definitely established only through the possibility of distinguishing between a bovine and a human type of bacillus, and through employing this method and isolating the bovine type of organism from human tuberculous infections. The studies thus far carried out in different countries, using the same methods of differentiation, agree in charging the human bacillus with a marked preponderance of infections. In this connection, however, there is one disturbing criticism that is now and again brought forth to shake the confidence reposed in these conclusions, based, as they are, on the differentiation of the types of bacilli. It is asserted by some capable workers that it is possible for the bovine bacillus to be so altered by years of sojourn in the human tissues that its essential characteristics become altered and it simulates the human type of bacillus. Without doubt, if this metamorphosis can readily take place, some of those infections which we now believe to have been of human origin may well have had their source in bovine infections of years ago, and it is to no purpose to designate them as human. In fact, if this be so, the entire method of differentiation which has accomplished so much in the past decade, and promises so much more in the practical and theoretical study of tuberculosis, would have to be regarded as not only unreliable, but misleading.

The main difficulty in studying this question in man is that we are rarely certain of the nature of the original infection and accordingly can not judge of the change of type. Our main reliance is generally circumstantial evidence. An exception to this rule, however, is furnished by those few cases of inoculation tuberculosis in which the bovine source of infection is definitely known. I have with difficulty found two cases of this nature, both in slaughter-house workers, and report a study of them coupled with some other experiments relating to the stability of the types of tubercle bacilli.

CASE 1.—This man had been employed in his present trade for seven years. Four years ago, while slaughtering an animal,

* From the Research Laboratory, Board of Health, New York.

he cut the middle finger of his right hand on the pointed end of a rib. He gave no thought to this injury until he found that it was slow to heal; he then merely applied various ointments. Gradually a nodule appeared at the site of the wound which assumed its present condition. He was aware of the tuberculous nature of this nodule, and in fact directed me to another worker who had the same skin lesion. I shall not enter into a minute description of the appearance of this nodule. It was of the size of a large pea, brownish-red and very firm in consistency. The glands at the elbow and axilla were not enlarged. The general health of the man was excellent.

CASE 2.—This case was very similar to the previous one. This man, while slaughtering a tuberculous cow, cut himself with a knife across the knuckles. This accident happened about six years ago. He remembered the date, as he was forced by this disability to quit work for some weeks and to enter the employment of another firm. As in the previous instance, a nodule appeared at the site of injury. The nodule was situated over the fourth left metacarpal joint, and resembled the tubercle described in the previous case, except that its surface was rougher and papilliform. This man also was healthy to all appearances; a large hard epitrochlear gland was palpable at the right elbow.

Both of these men were induced to have their nodules excised. After excision the surface of the growths was removed, and they were thoroughly washed in sterile water. Two guinea-pigs were inoculated subcutaneously with each growth. All four animals developed tuberculosis. It is not necessary for me to give in detail the method of isolating tubercle bacilli from the tissues or the criteria for differentiating the types. The method employed was that now generally followed and made use of by me in previous studies.¹ The cultural growth from these two cases proved to be very similar; in fact, I could not distinguish between them. They both grew sparsely on egg media. They also showed a high degree of virulence for rabbits, producing a generalized tuberculosis when inoculated intravenously in the dose of one milligram. In other words, they were typically bovine.

Before discussing these results I shall describe an experiment undertaken with the object of transforming the bovine type of the tubercle bacillus into the human type. An attempt was made to produce a culture medium resembling in its composition as closely as possible the human tissues. From the outset the inherent variance between an artificial culture medium and the living tissues was clearly realized. For this purpose, however, what may be termed "human-placenta glycerin broth" was devised. Human placenta was obtained under strict aseptic precautions and from this a broth was made, treating the placenta just as the beef is treated in preparing the broth for common use. One per cent. peptone, 0.5 per cent. salt and 5 per cent. glycerin were added. The entire preparation of this culture medium was conducted under as sterile conditions as possible. In order not to destroy the complement of the human placenta, heat was applied only to 55 C. It was possible in most instances to obtain a sterile broth by means of filtration through a Berkefeld filter.

Two bovine strains of known virulence, one of them having been under artificial cultivation for many years, the other only recently isolated, were grown on this culture medium for nine months, comprising eight generations. At the end of this period their virulence for rabbits was found to be as marked as at the beginning, showing that in this respect they had not approached the human type. In fact, the only change that was noted was one to be anticipated from artificial cultiva-

tion of any nature, namely, a greater facility of growth in the case of the strain which had been the more recently isolated. As this experiment was very laborious and promised so little, it was discontinued.

The question of the stability or variability of the types of tubercle bacilli has been discussed so frequently that I shall not review the testimony. In connection with this report, however, a few words on this subject seem in place. From the outset it should be realized that this question has a practical as well as a theoretical aspect, and that the two need not be in absolute accord. The former considers whether it is in any way possible by natural or artificial means to convert one type of bacillus into another type; the latter, whether the bacilli isolated from man and designated as human have been converted in his tissues from an original bovine type. These two points of view must not be confused. It is true that it has been demonstrated that under artificial cultivation strains may be greatly changed in their cultural and biologic characteristics. Indeed, a culture isolated almost ten years ago from a cow, and kindly sent to me by Prof. Leonard Pearson, I recently found to simulate the human type both in luxuriance of growth and diminished virulence for rabbits. Even after this long period of artificial cultivation, however, its virulence was still greater than cultures of the human type. Another bovine culture of about the same age was found to be markedly virulent for rabbits.

Such experiments clearly can not be translated into practical evidence on this question. Again, it may be advanced that experiments have been reported showing a conversion of human into bovine bacilli by means of passage through cattle; or of bovine into avian bacilli by means of passage through birds. Even if we accept these interpretations, however, and forego the criticism that has been levelled at them justly by others, we find these experiments to be very few in number and far outweighed by the many others in which no conversion of type was effected. When we consider the practical side of this question and draw our arguments from what we know of tubercle bacilli in man, the following should be borne in mind: It is true that atypical strains have been isolated by many investigators, strains neither typically human nor bovine. This intermediate group may in part be accounted for by attributing the variation to a change of environment, for example, of bovine bacilli in the new environment of human tissue. These atypical strains, it should be remembered, are exceptional; among three bovine and four human strains which I have isolated from man none belong to this category. Furthermore, this deviation from type can not be regarded as evidence of the possibility of a complete change of type. In this connection, it is worthy of note that typical bovine bacilli have been isolated from calcareous lymph nodes of human beings; in such instances the bovine bacilli must have existed in the human tissues for years without undergoing transformation. It has never been shown that the older the tuberculous lesion the less the likelihood of isolating bovine bacilli from man; and yet this corollary should obtain if the bacilli are readily converted in the human tissues. The question may be approached from another point of view. It is well known that no case of primary pulmonary tuberculosis has been indisputably proved to have been incited by the bovine bacillus. These cases form the great mass of tuberculosis and have been studied more than all others. If this form of disease is due in some instances to a bovine bacillus which has been transformed in the human body, we should at least occasion-

1. Hess: Cultures of Tubercle Bacilli isolated from Milk, Jour. Infect. Dis., June, 1909, p. 329.

ally encounter this type of bacillus before it has been converted into the human type, namely, in the early stages of the disease. Not only do we know that this is not the case, but we find that even the intermediate types are rarely met in the primary pulmonary cases. So that it would seem from a practical standpoint the question of transmutation of types may well be disregarded and we can safely continue to investigate the etiology of tuberculosis by means of differentiating the types of bacilli.

The two cases of cutaneous tuberculosis which I report claim some degree of interest because they constitute bovine infections occurring in adults. The fact that they remained localized should not be attributed to the low degree of virulence for man of the bovine bacillus, as it is well known that cutaneous affections due to the human type of bacillus, such as lupus or the "anatomic tubercles" contracted in the dissecting-room likewise do not tend to systemic invasion. Their main significance, however, lies in the fact that they furnish exceptional instances of bovine tubercle bacilli which have lived in the human tissues for many years without acquiring characteristics of the human type. From this point of view they constitute evidence against the conversion in the human tissues of bovine bacilli into human tubercle bacilli. It would be interesting and of undoubted value if those who have access to similar long-standing cases of tuberculosis would make them the basis of bacteriologic study.

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SYPHILITIC PSEUDOPARALYSIS*

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Few diseases have been studied with greater care than syphilis, nor have their individual manifestations been noted more in detail, and I am perhaps not far wrong in saying that the literature of medicine is more voluminous on syphilis than any other single disease. This is not a matter for surprise, for no disease has a more widespread influence on human ailment; yet it appears to me that, while the acquired form of syphilis is reasonably well understood, we are still lamentably ignorant of the significance of the hereditary form as it relates to many of the obscure conditions of childhood and young adult life. I therefore deem it not inadvisable to draw attention to just one manifestation of this taint and to report two cases illustrative of several observations which have been made on this class of case.

Syphilitic pseudoparalysis is a manifestation of inherited syphilis which exhibits itself during the first few months of life in a failure, disinclination or inability to move one or all of the extremities, and is variously alluded to in the literature as syphilitic pseudoparalysis, Parrot's paralysis, or merely described under the pathologic condition syphilitic epiphysitis, and belongs under the general class of osteochondritis.

There are various gross appearances dependent on the stage or degree of cartilaginous inflammation. Thus there may be a ring or collar apparent on palpation, partly or wholly surrounding the bone at the junction of the epiphysis with the shaft (usually upper) due to proliferation of the cells, or there may be a distinct separation at the same point due to absorption of the cartilage with accompanying free motion at the false

joint thus formed. Or again, there may be complete breaking down of the tissue with pus formation, finally rupturing through the skin forming an open abscess. Such cases, however, are thought to be due to secondary pus infection.

The first symptom to attract attention to this condition is the fact that the child does not move one or all of its extremities. Only one upper extremity may be affected or both arms and both legs. The frequency with which the various extremities are affected does not appear to be settled, and the only observer who reports a sufficient number of cases from which conclusions may be drawn is Bednar, who lists nineteen, as follows: Arms alone, 16 times (does not state whether one or both arms were affected—presumption both); legs only, once, and all limbs twice. While some authors state that it may occur in only one extremity, none cites a case without either both arms or both legs or all four extremities being affected. In case one or both arms are affected the child will lie with them rotated so far inward that the palms face outward. These cases resemble and are in appearance identical with brachial birth paralysis. When the legs are affected, however, the rotation is apt to be outward. Usually the affected limb is in a state of flaccidity, and if the arm is lifted and let fall it will drop again to the same position; or it may be rotated, and if there is separation at the epiphysis it may be moved freely at the point of separation. I doubt if in such cases as this the children ever give evidence of pain, but they certainly have no power of voluntary motion.

In other instances there is a more or less spastic condition, the joint resisting motion and the child crying out with pain on being handled. In addition are the symptoms which I have already described apparent at the joints.

The exact cause of these various symptoms, all accompaniments of the same pathologic process, seems to be as yet undetermined. Sundry theories have been advanced in an attempt to explain the several states of immobility; thus, some consider the flaccidity due to an inability to move on account of separation or absorption of cartilage, some to myositis, others to pain, and still others to involvement of the peripheral branches of the brachial plexus. Each of these may have a basis of fact in individual instances, but are all open to objection when a number of patients are observed, and do not hold true for all cases. Those which I shall report illustrate some of these points very well.

The diagnosis of this condition is exceedingly important since epiphysitis is said to be the most frequent manifestation of inherited syphilis and further because it may be the only evidence of the presence of the taint. There are but four conditions for which it is likely to be mistaken, viz.—scurvy, infantile paralysis, septic epiphysitis and brachial birth paralysis.

Scurvy is rarely seen before the fifth—usually from the sixth to the fifteenth month—is always bilateral and affects the shafts of the bones, while epiphysitis is located at the extremity, though it is well to bear in mind that cases have been described in which tenderness was present along the shaft as well—and appears rarely after the third month. Infantile paralysis also appears at a later date, is frequently epidemic and the history, onset and course are entirely different. In septic epiphysitis the constitutional symptoms are pronounced and the temperature elevated.

The diagnosis from brachial birth paralysis seems to me to be the most important and presents the greatest

* Read in the Section on Diseases of Children of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.