atrophy of the right pyramidal tract. The paper was further illustrated by three excellent plates.

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## ITALY.

*By W. Ford Robertson, M.D.*

*Bacteriological Researches in Acute Delirium.*—The question of the relation of certain forms of acute mania to bacterial infection is one that has lately been brought prominently forward in this country. A recent paper by Ceni (*Rivista Sperimentale di Freniatria*, 1897, Fasc. iv, p. 796), in which the observations that have been made upon the subject on the Continent are somewhat fully reviewed, may therefore merit notice here at some length.

For some time, he says, there has been an inclination to regard acute delirium as determined by either auto-intoxication or infection. Briand in 1881 was the first to observe organisms in the blood in such cases, and to contend that the condition was infective in origin. In 1884 Rezzonico described a case in which the vessels of the brain contained emboli of micrococci. In 1892 Buchholz observed bacilli and micrococci in preparations from one case, although cultures made from the blood remained sterile. About a year later Bianchi and Piccinino asserted that they had demonstrated experimentally the infective nature of acute delirium. They isolated from the blood and cerebro-spinal fluid of patients who died from the disease what they believed to be a specific form of bacillus. In some forms of acute mania they were unable to find this organism, and they concluded that among the forms of mental disease attended by acute delirium there is one to which we are entitled to give the name of "acute bacillary delirium." This form was distinguished from all others, according to the authors, not only bacteriologically, but also "by the greater intensity of the symptoms, by the adynamic phase which quickly follows that of excitement, by its very rapid course, and its fatal termination." Rasori shortly afterwards described another form of pathogenic bacillus which he found in the blood and cerebro-spinal fluid in a similar case. In 1895 Martinotti stated that he had been able to isolate from the blood and cerebro-spinal fluid of cases of acute delirium only some common organisms, staphylococci and micrococci, which, on the other hand, Bianchi and Piccinino had only been able to obtain from allied forms of mania. In 1896 Cabitto made a bacteriological examination of five cases which were clearly of the nature of acute primary delirium. He was unable to find any organism in the blood. In one case, however, he found in the liver and spleen an organism identical with that of Bianchi, and also the *Staphylococcus pyogenes albus*. It is thus evident that the observers who have investigated the

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subject of the relation of acute delirium to bacterial infection are by no means in accord with regard to it.

Ceni has made an examination of the blood and cerebral tissues from two cases of typical acute delirium. He was unable to find the bacillus of Bianchi. On the other hand, he obtained from the blood in both cases pure cultures of the *Staphylococcus pyogenes albus*. He observed the same organisms in microscopic preparations of the brain. These observations Ceni regards as having demonstrated that in acute primary delirium the presence of the specific bacillus described by Bianchi and Piccinino is not constant, while, on the other hand, it is possible to find other organisms in the blood in such cases. The presence of these organisms must, he thinks, be looked upon as the result of a secondary invasion from the natural cavities of the body. It cannot be regarded as having any direct ætiological importance in acute delirium. While, owing to insufficiency of contrary proof, he is unable to deny the existence of a specific bacillary agent in acute delirium, he suggests the possibility of a mixed infection, such as has recently been demonstrated by Sanarelli to occur in certain cases of yellow fever, resulting in the complete disappearance of the specific bacillus in consequence of a rapid invasion of common organisms from the intestine. There are not, however, as yet sufficient data to allow of this hypothesis being accepted. For the present he thinks it is preferable to admit a simple auto-infection by germs which, owing to some special bodily conditions attending acute delirium and the other psychopathic forms in which these organisms have been found, invade the tissues from the intestine, complicating and aggravating the primary disease. This view is supported by various observations in experimental pathology which show that auto-infection of intestinal origin can occur in consequence of powerful disturbance of the animal organism from various causes.

*Auto-infection in the Insane.*—Some further light on the questions discussed in the paper noticed in the preceding section is afforded by a preliminary note more recently published by Ceni and G. C. Ferrari (*Rivista Sperimentale di Freniatria*, 1898, fasc. i, p. 182). These observers have made a bacteriological examination of the blood of eighteen lunatics suffering either from acute maniacal excitement clinically analogous to that of acute delirium, or from the mental confusion associated with repeated epileptic seizures. In each case cultures were made from the blood from day to day so long as the severe mental symptoms lasted. Growths of bacteria were obtained from seven of the cases (one being an epileptic), while in the remaining eleven the results of the examination were quite negative. In the former group there had been in each case noteworthy elevation of temperature; in the latter there had been none. In the positive cases pure growths of germs were obtained in each instance, and the form remained constant for each individual throughout the period of examination.

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These forms were in one case the *Staphylococcus pyogenes aureus*, in another the *Staphylococcus pyogenes albus*, and in the remaining five streptococci. In two of the cases which terminated fatally, the organisms which were isolated were in the one case the *Staphylococcus pyogenes aureus* and in the other streptococci. Although the organisms present were the same in some of the cases, their virulence, as tested upon rabbits, varied greatly. Thus in the two cases which terminated fatally the organisms showed a high degree of virulence, while those from the other cases produced no reaction either local or general.

The authors conclude that, as a rule, in the class of cases under investigation, germs are present in the blood only when there is fever; and that the presence of the fever, and the course and result of the illness, do not depend so much upon the kind of germ as upon the degree of its virulence. The germs have no ætiological relationship to the mental disease. They represent merely a complication, the determining causes of which are at present unknown, but which is probably essentially related to severe disturbance and exhaustion of the bodily forces.

*The Parathyroid Glands.*—Since the great importance of the parathyroid glands was established two years ago by Vassale and Generali (see *Journal of Mental Science*, July, 1897, p. 611), much labour has been expended upon their further experimental and histological study by several workers on the Continent and in this country. The conclusions formulated in 1896 by the observers just named have been confirmed by the experimental work of several others, among whom may be specially mentioned Gley in France and Welsh in this country. Vassale has recently (*Rivista Sperimentale di Freniatria*, 1897, fasc. iv, p. 915) given a very full account of some remarkable observations made in the course of his own more recent experimental work. The subject of the experiment was a bitch, upon which partial parathyroidectomy was performed, the left internal gland being alone allowed to remain. A few days later the animal presented in a mild form symptoms which are now recognised as those of parathyroid insufficiency, and which may or may not follow partial parathyroidectomy. From these she soon recovered, although for some weeks afterwards there were occasional slight returns. Eighteen months after the operation she gave birth to eight pups, seven of which she suckled. All went well until the fifth day, when the mother was suddenly seized with violent tetany (*tetania*),—the name which the author applies to the group of symptoms produced by ablation of the parathyroids. The illness was so severe that it was feared that the animal was about to die. As indicated by the results of previous experimental observations, very large doses of thyroid gland were at once administered, both subcutaneously and by the mouth. In about three hours the animal had completely recovered, and was suckling her pups. The experiment was subsequently varied in

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numerous particulars, into which it is impossible to enter here. Suffice it to say that it was found that further attacks of severe tetany could always be rapidly overcome by large doses of thyroid gland; that, on the other hand, an attack could be induced by stopping a small daily dose of thyroid, and that attacks could be entirely prevented and the animal kept in good health by the daily administration of very large doses of the gland. After lactation had ceased all thyroid treatment was suspended, and the animal still remained well.

In this paper Vassale does not make clear to the reader his own views as to why the tetany of parathyroid insufficiency should be curable by very large doses of thyroid gland. Unfortunately the later papers upon the parathyroid glands by himself and Generali have been published, not in the neurological journal in which their earlier work was recorded, but in the *Riforma Medica*, to the particular issues of which containing the articles in question we have been unable to get access. Vassale, in the paper under review, seems almost to imply that he attributes the potency of the thyroid gland in the tetany of parathyroid insufficiency to the fact that it contains, or has attached to it, the internal parathyroids. But the experiments of Welsh in this country have shown that the ingestion of parathyroids has no influence in overcoming the effects of parathyroidectomy.

A point of much interest in the above experiment is that this animal suffering from parathyroid insufficiency could take enormous doses of thyroid substance without apparently suffering any of the usual toxic effects of such doses. From 60 to 100 grammes of the dried gland of the pig were given daily for a considerable period.

Vassale points out that this experiment proves that the function of the parathyroids is not only one indispensable to the economy, but one that cannot be replaced by other glands. The early symptoms of parathyroid insufficiency disappeared owing to compensatory action of the remaining internal parathyroid; but rather than a complete functional compensation on the part of the one existing parathyroid, there was probably an adaptation of the organism. This was suddenly disturbed when there arose a cause which acted more or less profoundly on metabolism, the cause in this instance being excessive lactation. Eighteen months after the operation, therefore, the condition of parathyroid functional insufficiency remained in a latent state. The author draws a parallel (without suggesting any identity) between this latent condition in his experiment, and a neuropathic constitution in cases of lactational insanity.

*A New Journal.*—Still another neurological journal has been started in Italy under the name of the *Rivista Quindicinale di Psicologia, Psichiatria, Neuropatologia ad uso dei Medici e dei Giuristi.* The first number appeared in May, 1897. Each fasci-

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culus, of which twenty-four are published yearly, is composed of sixteen pages, and contains, in addition to original articles, digests of current neurological literature and reviews of books. The journal is the organ of the Psychiatric Clinic of the Royal University of Rome, and is edited by Dr. E. Sciamana, Director of the Clinic, and by Professor G. Sergi, who fills the chair of anthropology and experimental psychology. From its commencement it has been conducted with great ability. Many original papers of much interest have appeared in its columns, and the digests of contemporary literature have been numerous, and evidently most carefully written. The journal, the annual subscription to which is only six lire, may be safely recommended to those in this country who may desire to keep abreast of the more important neurological work which is being done in Italy.

*Changes produced in the Central Nervous System by Want of Sleep.*—Two Italian neurologists, independently of each other, have recently made some experimental observations upon this subject which furnish a new anatomical basis for clinical phenomena of the first importance in mental diseases.

L. Daddi (*Rivista di patologia nervosa e mentale*, 1898, fasc. i, p. 1) describes the microscopic changes in the nervous system of three dogs, which he compelled to keep continuously awake until they died. One of them was at the same time deprived of food. This animal lived for seventeen days, the other two for eight and thirteen days. Large numbers of the cortical and other nerve-cells showed more or less advanced chromatolysis, swelling of the cell body, and vacuolation of the protoplasm. The method of Golgi revealed also varicose atrophy of the protoplasmic prolongations and disintegration of the cell body. The nucleus presented marked structural changes, and was in many instances displaced to the periphery of the protoplasm. These alterations the author regards as the expression of a process of atrophy of the nerve-cell. He thinks they are not due to an inflammatory process, as the vessels and neuroglia were always normal. In all three cases they were most marked in the frontal lobes, next in the sphenoidal and occipital lobes, parietal lobes, cerebellum, and spinal ganglia. The medulla and cord seemed unaffected. He thinks that these morbid changes in the nerve-cells may be in part due to the modification in the general nutrition which Tarozzi has proved to result from insomnia, but that there are reasons for believing that they are also caused by a special action of insomnia and over-exertion. They are not characteristic of insomnia, but correspond essentially with those found by other observers to result from prolonged electrical stimulation and fatigue, as well as with the changes that have been described in mental diseases, in various forms of poisoning, &c. But although the nature of the lesions is not characteristic, their distribution, and notably their special implication of the frontal lobes, are, the author claims, almost so. He

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regards the results of his researches as confirmatory of the theory of Pflüger, according to which during consciousness there is a consumption of the component substances of the nerve-cells, and a restitution of them during sleep. The need of sleep depends upon modifications produced during the conscious state in the elements of the nervous system, and more especially in those regions which he has found affected in his experiments, although the finer modifications corresponding to the purely physiological degrees of this need cannot be demonstrated by any of the histological methods yet devised.

Agostini (*Rivista Sperimentale di Freniatria*, 1898, fasc. i, p. 113) has carried out two very similar experiments upon dogs, and has found changes in the nerve-cells corresponding to those described by Daddi. He gives a minute description of the morbid phenomena presented by the animals during life, and concludes that continuous insomnia induces a state of progressive blunting of the mental faculties, of the sensory perceptions, and of the cutaneous and other reflexes. The clinical picture is one with many resemblances to general paralysis of the insane.

He also relates two cases—one that of a man of forty-five and the other that of a young woman—in which several days of enforced deprivation of sleep resulted in attacks of insanity of sudden onset and characterised by excitement, mental confusion, delusions and hallucinations. Both patients recovered after a prolonged sleep. He also refers to the case of the cyclists who manifested symptoms of serious mental derangement in the course of a six days contest at New York, and relates an experience of his own in an Alpine excursion, when he as well as other members of his party, after walking for three days without any proper rest, suffered in the night-time from various remarkable hallucinations of sight.

Agostini maintains that these cases of mental disorder produced by want of sleep should be included in the group of acute transitory psychoses from exhaustion or from intoxication. The most probable cause of the morbid phenomena is, he thinks, an auto-intoxication of the cortical nerve-cells from excessive production of waste materials or defective elimination of them. Similar changes are produced in nerve-cells by various known toxic agents. These may cause permanent and irreparable alterations in the cells, but more often they cause merely transitory disturbances with subsequent complete *restitutio ad integrum*. He urges that the results of these experimental observations should emphasise the great importance of combating insomnia in the various forms of mental disease especially in their early stages, in order to save the nervous elements from so grave a cause of exhaustion and degeneration.

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