

thenia with the barriers of inhibition swept away.

The melancholic's delusions represent nothing more than an intensification of the psychasthenic's obsessions of sacrilege, of crime, of disease, of shame of self and shame of the body; the phobias of both—the most characteristic expression of the adynamic state to be found in symptomatology—are absolutely identical, both in kind and degree; their crises of agitation and anxiety show no noteworthy points of dissimilarity; their ties, their *folies du doute* are the same; the same manias of oscillation, interrogation and omens are found in both,—indeed, this symptomatic parallelism might be extended to the point of wearisomeness. Whatever differences there may exist in symptoms are differences in intensity only. For further examples,—the psychasthenic, actuated by feelings of remorse, shame of self or of the body, desire for expiation or reparation, general sense of unworthiness or what not, has impulses toward self-mutilation or self-destruction, which are never fulfilled, while the melancholic, actuated by motives identical in kind, but of sufficient intensity to annihilate inhibition, really maims or destroys himself. A final and even more striking illustration of the point under consideration is furnished by the feeling of strangeness and depersonalization. It is experienced by the psychasthenic and the melancholic alike, but whereas the former, by constant argumentation succeeds in convincing himself that it is *his* hand with which he performs certain movements, *his* feet which carry him about, *his* voice with which he speaks, the melancholic falls, by the intensity of the above morbid feeling and by the consequent complete loss of inhibition, under the domination of the delusion that the various members of his body are not actually his, that they are not real living parts, that he is, in fact, non-existent; and he finally carries his notions of nihilism to the point where they embrace all the phenomena of the universe.

The query now arises: Are involuntional processes the factor responsible for the intensification of morbid feelings which transforms psychasthenia into melancholia?

That the answer must be in the negative is determined by several facts, two of which are most conclusive: The first comes from the march of events in certain cases in adolescents where the symptom-complex is at the outset that of psychasthenia and the terminal stage a dementia, called *precox*, which has no demonstrable connection with general involuntional processes, yet is indistinguishable from one terminal stage of the disease designated, under present usage, as involuntional melancholia; the second is drawn from the observation of depressed states identical with so-called involuntional melancholia, which make their appearance during the flood-tide of mental and physical vigor, run their course and recover, and which may even recur

and again recover several times over before involuntional processes in the economy have fairly started.

On the strength of all the facts adduced, the writer ventures to contend that the term *involuntional* not only adds nothing to our understanding of the disease melancholia, but that it is positively misleading from the standpoint of pathology—hence, should be discarded.

BACTERIOLOGICAL WORK AT THE AMERICAN AMBULANCE.*

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AND

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THE following report is based upon the bacteriological work which was done as a part of the Harvard University Service of the American Ambulance, from April 1 to July 1, 1915.

There was an excellent general pathological and bacteriological service organized and well equipped, as one of the sub-departments of the institution, under Dr. Joblons, when the Harvard Service came on duty, April 1, 1915. After Dr. Joblons' resignation in April, Dr. Kenneth Taylor took charge of the general pathological work, and the writers would here express to these two gentlemen their gratitude and appreciation for the assistance they gave to the Harvard Service in the equipment of its own laboratory, and in the institution of its special work.

Owing to the departure of Dr. Richard P. Strong for Serbia, the Harvard Unit lost the benefit of his continued direction and counsel. The bacteriological work, however, was carried out as nearly as possible in accordance with the plans laid down by him. The work which is here described was outlined by Dr. Strong before his departure for Serbia, but it was a great loss to us that he was unable to remain in Paris and direct it.

Our purpose was to determine, if possible, whether there was more than one strain of gas bacillus causing gas gangrene, and, if so, to study the growth of these bacilli in various sugar media, and try to differentiate them by this means. In addition, we were interested in the relation of the gas infection to the type of missile which had caused the wound, the presence or absence of clinical symptoms, and several other phases of the subject.

Cultures were taken from fresh wounds which showed any discharge. Many of our admissions had no discharge, some were overlooked, and others arrived before the laboratory was fitted for work, with the result that we obtained cultures from 100 different men. One hundred and thirty-two different cultures were taken on these

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Number.		Plain Agar.	Glucose Agar.	Lactose Agar.	Leculose Agar.	Maltose Agar.	Mannite Agar.	Inulin Agar.	Nitrate and Glucose Agar.	Morphology and Gram Stain.
1529	Gas Growth	4 —	4 —	3 —	5 —	3 —	0 3	5 —	3 —	Large Gram pos. and neg. rods, blunt ends.
1321	Gas Growth	3 4	3 —	2 2	5 5	5 5	1 1	3 3	4 3	Large blunt ended rods both Gram pos. and neg.
1675	Gas Growth	2 —	— —	— —	0 3	0 3	3 —	0 3	0 3	Small Gram neg. thin bacillus, one-half size of anthrax.
1612	Gas Growth	0 2	— —	1 3	5 4	4 4	1 1	3 3	4 3	Short Gram pos. round ended rods. Few ovoid forms.
1630	Gas Growth	1 3	— —	3 5	4 4	5 5	1 3	3 5	3 5	Large round ended Gram pos. rods.
1845	Gas Growth	3 4	— —	2 3	5 5	5 5	2 3	2 5	4 5	
1717	Gas Growth	3 5	— —	2 3	5 5	5 5	2 3	3 5	5 5	
1010	Gas Growth	2 2	— —	2 4	1 1	4 5	1 3	1 3	3 5	Gram pos. blunt ended rods, size of anthrax.
1011	Gas Growth	0 1	— —	1 4	4 5	4 5	1 3	— —	3 5	
1080	Gas Growth	0 1	4 5	0 3	1 3	1 3	4 5	3 3	3 3	
932	Gas Growth	0 1	4 4	0 1	4 5	4 5	1 2	1 3	3 5	
2019	Gas Growth	2 1	4 5	2 2	3 5	4 5	0 1	0 1	3 5	Large Gram pos. bacilli, size of anthrax.
1071	Gas Growth	1 3	3 3	3 5	1 3	0 3	3 5	3 5	2 3	Large square ended Gram pos. bacilli, often in pairs.
2105	Gas Growth	3 5	3 5	1 1	3 5	5 5	3 5	2 5	3 5	Same as 1071, both showing of- ten irregular and bipolar staining.
Bx.	Gas Growth	2 2	2 3	1 2	— —	5 4	1 2	2 3	4 4	Short, Gram pos. rods with rounded ends, often in short chains.
2214	Gas Growth	1 3	5 4	2 2	— —	3 4	0 2	2 3	5 5	Rather slender, long bacilli with rounded ends, often in pairs, Gram pos.
2196	Gas Growth	1 3	4 4	0 0	— —	4 4	1 3	3 4	2 3	Moderate sized, round ended rods, Gram pos., with many central spores.
1888	Gas Growth	0 3	4 4	2 2	— —	4 4	0 2	2 3	3 3	Moderately long, Gram pos. rods. Spores at ends or mid- dle.
Aver- ages	Gas Growth	1.5 2.7	3.6 4.1	1.6 2.6	3.3 4.1	3.6 4.4	1.4 2.6	2.2 3.6	3.2 4.1	

cases, as some had multiple injuries and others had cultures repeated. A few cultures of clothing were taken, but that phase of the work was mainly in the hands of another worker, as were the animal experiments, with these organisms.

Our method of procedure, as outlined by Dr. Strong, was as follows: Cultures were taken from the patient on admission, on sterile cotton swabs, and inoculations made in plain bouillon. From this medium re-inoculations were made in

plain agar stabs and slants, and glucose agar stabs. Agar plates were made also in some of the cases. The original bouillon culture was then heated to 60 or 70° C. for thirty minutes or more, to kill non-spore-bearing organisms, and re-inoculations made in glucose agar stabs. After twenty-four hours' incubation the growths were examined, and the attempt made to isolate the colonies from such cultures as showed gas production. Rarely pure cultures

were obtained at this stage, but usually it required repeated plating and re-inoculations to accomplish this. When the cultures were obtained pure they were grown anaerobically, by means of pyrogallie acid, on a glucose agar slant, and further inoculations made from this growth. We used the following media: Plain bouillon, glucose bouillon, bouillon Martin, egg bouillon, peptone solution, litmus milk and agar, gelatine, plain agar, and agar to which had been added one of the following sugars: Glucose, lactose, levulose, maltose, mannite, and inulin; also glucose and nitrate media, and potato. These were incubated twenty-four to forty-eight hours and the results recorded. Staining reactions, morphology, motility, etc., were noted.

Of the 100 different men, the cultures from 28 showed gas-producing organisms. However, for one reason or another, we were able to obtain pure cultures of only 18 different organisms to run through the various sugar media.

The amount of growth and gas production was recorded by numbers. The numeral "1" indicated, for example, very slight; "5," very large gas production, with the intermediate numerals for amounts between these extremes. A table was made, using these figures, and the average values of gas production computed for each sugar medium by adding the numbers set down for any one sugar, and dividing by the number of organisms. These average values were then compared with the figures for the individual organisms, and although we had several different strains, we could find no greater variations from the average among these strains than among different individuals of the same strain. The results seemed to show that it is the type of sugar, and not the strain of organism, which dictates the amount of gas production. In short, from our work with the sugar media it appears that they are not suitable as a means of identification or differentiation of the gas-producing bacilli.

While 28 of the men whose wounds were cultured showed the presence of gas bacillus, only 9 of these had any clinical signs of a gas infection, and in 7 of these latter cases there was only slight subcutaneous crepitation, or a few bubbles of gas in the pus, signs which disappeared at once on wide incision. Of the 2 patients who had severe symptoms, one had a very bad gas infection of the leg, and one died of gas bacillus septicemia, following infection of the arm. Both of these cases were clinically developed on arrival at the hospital, and in no instance did a positive culture foretell subsequent trouble from gas infection.

The majority of cultures showed staphylococcus, either alone (30), or with other organisms (58). Forty cultures showed an anaerobic growth of other than gas producers. Other organisms seen were: pneumococcus (11), streptococcus (9), pyocyanus (5), and varieties of anaerobes other than gas producers (25).

What effect the presence of fragments of cloth

or shell in the wound had in relation to the finding of gas bacilli in the cultures, was an interesting question. Out of 7 cases in which cultures were made from the cloth picked from the wounds at operation, 4 showed the presence of gas bacilli, while 3 were negative. In 2 of the positive cases, the pus from the wounds did not show gas organisms.

The type of missile seemed important, for of the 28 cases positive for gas bacilli, the wound was caused by shell fragments in 17, or 61%; by rifle bullet in 7, or 25%; by shrapnel in 3, or 11%; and by mitraille in 1, or 3%. When this is compared with the figures for the total cases, we find that fragments caused only 42% of all the wounds, as against 61% of the gas infections; and rifle bullets 40% of the wounds, and only 25% of the infections. Shrapnel caused 10% of the wounds, and 11% of the infections. The striking thing, then, is the much greater liability of a shell fragment to cause gas infection as compared with a rifle bullet, undoubtedly due to the fact that it is more likely to carry cloth and dirt with it than is the rifle bullet.

The men whose cultures showed gas bacilli averaged to have the same treatment as those who did not. It is not possible to say, either, that the men who showed severe clinical symptoms had any poorer treatment immediately after injury than many who had no symptoms at all.

The question of the utility of baths and recent changes of underclothes as preventatives of gas infections seems to be answered in the negative. The nature of the warfare is such that the uniform is always dirty, and it is from this dirt, undoubtedly, that the infection comes—not from the linen or skin.

The regions vary somewhat as to the prevalence of gas infection in the wounds. This regional difference is shown by the fact that out of 17 cultures from patients from the Ypres region, only 2 showed gas bacilli (12%), while out of 41 from men from Arras, and nearby points, there were 19 positive cultures (46%).

We could form no idea of seasonal changes, for we were there but a short while, and the increase in positive cultures during June may have been due to the increased activity around Arras at that time.

SPINA-BIFIDA.

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On September 26, 1907, I read a paper on Spina-Bifida before the East Tennessee Medical Society in Knoxville, Tennessee, reporting three cases of spina-bifida, which were operated. This paper was published in the *BOSTON MEDICAL AND SURGICAL JOURNAL*, Vol. clviii, No. 5, pp. 154-157, Jan. 30, 1908.