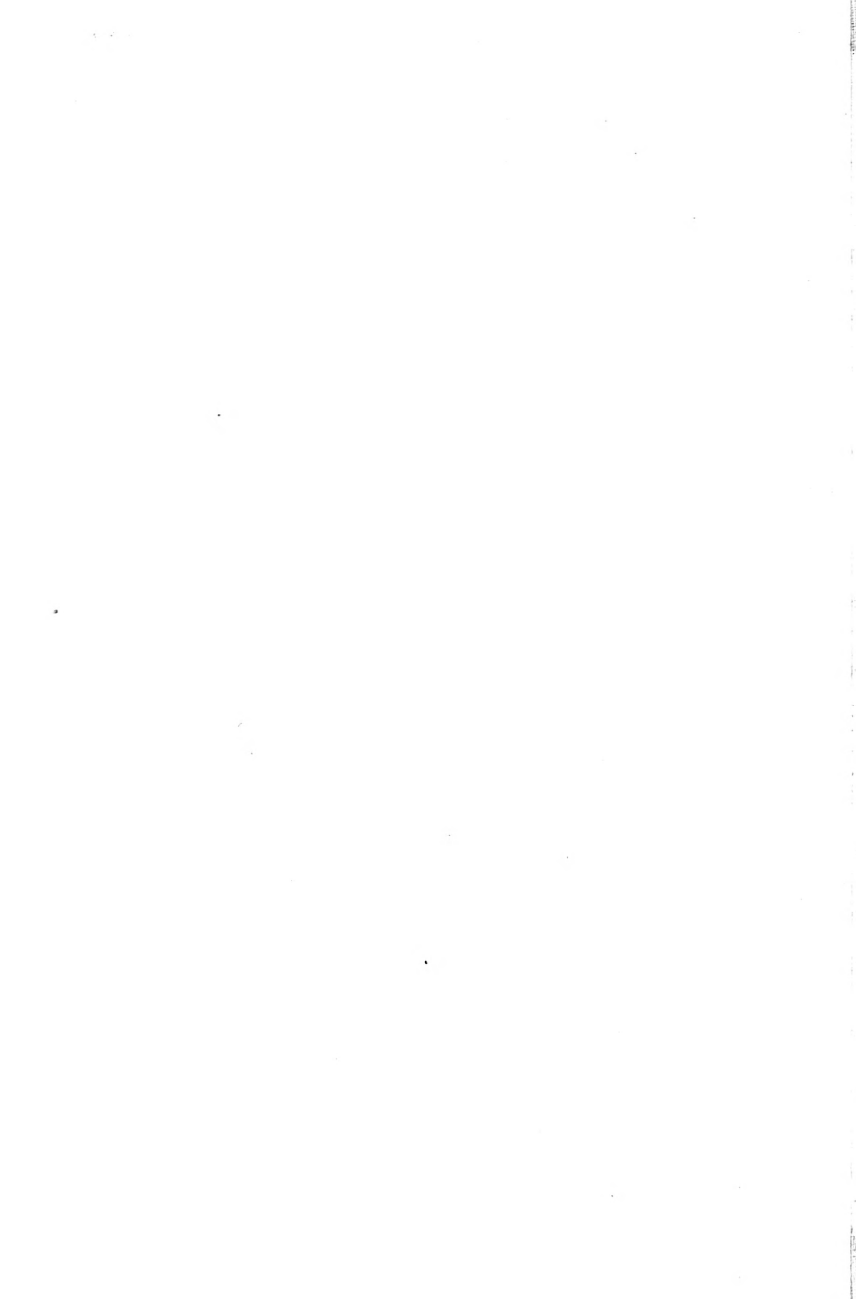


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The Journal

OF

Nervous and Mental Disease

AN AMERICAN JOURNAL OF NEUROLOGY AND PSYCHIATRY

FOUNDED IN 1874

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The Journal OF Nervous and Mental Disease

An American Journal of Neurology and Psychiatry, Founded in 1874

Original Articles

ESSENTIAL LIMITATION AND SUBDIVISION OF IDI- OCY ON A COMPARATIVE-PSYCHOLOGICAL BASIS*

BY H. DE JONG,

AMSTERDAM, HOLLAND

In connection with experiments on the formation of ideas in the dog,⁵ which I carried out in the laboratory of Prof. Buytendyk in 1918, I had the idea of using the methods of comparative psychology in psychiatry. The first possibility of realizing this was given, when in June, 1919, I found in the psychiatric-neurological clinic of Prof. Dr. K. Bouman a four-years-old microcephalic idiot, whose reactions to his surroundings strongly suggested the behavior, which is called non-ideational in animal psychology. To me this was a good occasion for a systematic analysis, which fortified my suppositions.

Before recording my experiments I shall offer some theoretical remarks, and in the first place discuss the question. "What is non-ideational behavior?" Hunter⁴ gives a vague, not sharply limited definition. He distinguishes two kinds of reactions:

1. A sensomotor one, i.e., a simple adjustment of a certain movement to a certain object or situation without formation of ideas.
2. A more complex one, in which ideas are intercalated between the impression of the object or situation and the reaction to it. In this one, ideas or images are processes centrally aroused. The

*Thanks are due to my friend, H. C. van der Heyde, Biol. Docts, Morgantown, W. Va., who translated this paper for me, and to Prof. Dr. Withrow Morse, who corrected the manuscript.

sphere of the ideas is limited to the aspect of the object (i.e., the sensory part of it) or to the movement and its consequences (i.e., the motor part of it).

Moreover Thorndike, one of the founders of animal psychology in America, suggests the possibility and proves the probability of associative reactions without intercalation of abstract ideas; certain sense-impressions might cause impulses without psychical intervention. The soul of such an animal would be like: "what we feel, when consciousness contains little thought about anything, when we feel our own body and the impulses we give to it. Sometimes one gets this animal consciousness while in swimming for example. One feels the water, the sky, the birds, but with no thought about them or memories of how they looked at other times, or aesthetic judgments about their beauty, one feels no ideas what movements he will make, but feels himself make them, feels his body throughout. Selfconsciousness dies away. The meanings and values and connection of things die away. One feels sense-impressions, has impulses, feels the movements he makes, that is all."

A series of phantastic and sentimental psychisms arise in that way, however with this negative positiveness, that in such a psyche there is no room for analogy with abstraction, imitation, knowledge of purpose, and insight.

Between the reaction with and without formation of ideas lies in the first place, what Hobhouse calls "practical judgment."³ As an example the following consideration: When I see one side of a house, I am able to lay a connection between the invisible part of the house and the part I see, and remembering where the door is, I can go there. It is a kind of thinking without language, which is in that way the discrimination between practical judgment and a logical understanding.

A second series of limit-cases is given by the notions, which Bühler introduced with reference to the experiments made by Köhler on apes, I mean, the "Bemerken von Sachbezügen" and the "Aha-Erlebnis." As an example how such an ape can use the results obtained in simply playing, may be cited the following case: The ape is playing with two pieces of bamboo. Partly accidentally he succeeds in fitting these two pieces together. The animal understands immediately ("Aha" say German people in such a case, therefore the not very melodious technical term cited), that it can use this long stick, e.g., to reach a piece of fruit lying at a greater distance, and afterwards it applies the fitting together every time.

Bühler compares this with the "Vorsprachliches Denken" of the kid. According to him it is not a real "Einsicht," an understanding in logical connection—a very discussionable hypothesis.

Recent research seems to prove, that at least in subanthropoids no formation of ideas can be shown.²

Returning to our research on oligophrenic patients, we can state, that we can leave aside, the minute nuances on the limit of reactions with and without formation of ideas. We have only to do with reactions, which prove the presence or absence of power of understanding. The term formation of ideas is not used to prevent confusion with the higher organized psychisms which in daily life are called ideas. For the same reason there is no room in this psychology of rudimentary human minds for the terminology of Wundt, which is to be used for the plainly developed human mind.

This power of understanding I would define as the psychological basis, which makes it possible, to react in an adequate way to a new situation, however simple this situation may be, however small the difference between the required reaction and an already learned mechanism may be.

When we now look at our little microcephalic idiot, called Hanesje B., it appears in the first place, that he has not the power of understanding spoken words, while he himself is not able to speak. Moreover is he ambidexterous, and much too small for his age. Hearing and vision are, as far as controllable, normal. When one shows some object to him, and makes some noise with it, his reaction consists of strongly trembling movements up and down of the upper part of his body and his arms. There are no neurological or somatic abnormalities.

For my first series of experiments I took a series of actions as favorable as possible: the desire of climbing on the bed of a neighboring patient. My method consisted of repeating of each experiment numerous times, eventually under addition of very simple modifications, which were supposed to represent a new situation. During the experiments I made an exact protocol of each movement and reaction. Our research in animal psychology taught us, that this method is a very reliable one. Repetition of the experiments is necessary, because in this way many times a seemingly intelligent reaction is unmasked as an accidentally right one, when success is not reached in another way. It is possible to perform the right reaction in a very simple mechanism by a merely accidental movement, while in that case the reaction will again be repeated in the wrong way, when the right reaction was obtained without intelli-

gence. But it is impossible for one to perform a simple movement, the meaning of which he "understands," several times in a wrong way and apparently without intelligence.

The first series of experiments concern in that way a study of his desire to climb into a bed. The protocol is as follows:

June 18, 1919. I. The patient is placed near the bed, in which he spontaneously tries to climb. The rim of the bed can just be reached by his hands. Occasionally he lifts up one of his legs, and rises on his toes. He is baited by jingling keys above the bed, or with an electric light. He tramples with his feet, but can not reach the object of his desire. A chair is now placed near the bed. He takes hold of it for a moment, then he pushes away the chair and takes no pain to climb along the rungs. Now he again takes hold of the rim. The chair is replaced in the right position, he is now baited by moving a spoon with sugar above the bed. To reach this he clings to the rim of the bed close to the chair (vide Fig. 1). Then

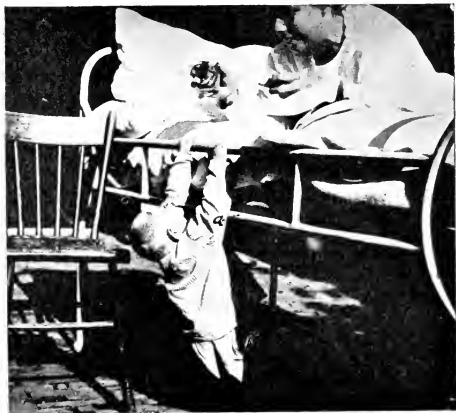


FIG. 1

he throws away the chair, and lifts for a moment his foot without however touching a rung. II. His feet are placed on the first rung, then he is placed on the chair. III. This is repeated. IV. He is lifted up to such a height that his feet are right under the rung. He lifts up one foot, but not to the rung. V. Same movement under the rung. VI. Same movement above the rung. VII. The same. He touches the rung with his heel. VIII. Once more he is put

through the action. IX. Being placed in front of the chair, he puts his foot several times above the rung, finally on it. Though he is helped now, he is not able to perform the rest of the action. He must still climb one rung higher, but performs quite inadequate tossing movements with his legs. Then he is helped on the seat of the chair. It is obvious that he strongly desires to reach the bed, in the direction of which he is baited by one of the assistants. The child laughs in his direction, claps with his hands on the rim of the bed, and makes his trembling "desiring" movements. *Nevertheless he is not able to bridge the small space between the rim of the bed and the seat of the chair.* In performing this movement he could moreover use the perch of the bed marked *A . . .*, when only he was able to understand.

We notice here a reaction without any proof of power of understanding, while attention to the task may safely be supposed to be present. It can not be stated, whether the movements of the foot above or under the rung are due to "imitation without understanding" or to an instinctive impulse. In the direction of the last supposition points the fact, that the little idiot always flexes his legs, when he was lifted by his arms. Spectators called this an ape-like movement.

Similar experiments were carried out during a few days. On the 23d a chair is placed near the bed, as soon as the child is observed to try to climb into the bed spontaneously. He pushes it away, lifts his feet several times, but places his foot above the rung. Again he does not succeed in reaching the rim. On the 28th he again completely fails in his attempts to climb into the bed of the patient *B*, whom he seems to like very much.

On the 29th his power of imitation is again tried out intensively. Ten times he is put through the climbing-mechanism. After each trial he must try to climb (the patient *B* is again the bait). He puts his foot above and at the other side of the rung, clings again to the upper rim of the bed, lifts up his two legs as he is hanging on by his arms, claps the chair for pleasure, but does not reach the top.

When we put him through and he reaches the rung, and touches the object then in lifting up his leg upon the seat, then, but only then he is able to reach the top, when we hold him fast voluntarily. One moment one might suppose intelligence operated here, but this seems to be very improbable, when we consider that the seat of the chair is so very large, that an accidental lifting up and moving down of the feet always give the desired effect. Moreover he puts his foot down in an inadequate way, and each time at another place.

When he has reached the seat with our aid, he is extremely near the patient, the object of his desire. In no case however was he able to pass the rim of the bed, never could he use the perch *A*. That he is really not able to surpass this short distance, though his desire is intensive, is shown by the fact that he stretches out his arms towards the loved patient *B*, and by his impatiently repeated clapping on the bed-rim.

Lack of power of understanding is again evident. The same can be said about the power of imitation. Fig. 2 shows a normal girl of 3 years old "intelligently" reacting to a piece of chocolate held above the bed while Hannesje is incapable of imitation.



FIG. 2

In another series of experiments to study his power of understanding and imitation he was obliged to catch a desired object with a little lath. It appeared that a little basket with two ears containing a key with which he often plays is most fit to attract his attention. When I rattle with it he jumps for pleasure and tries to catch the basket. When he can reach it he succeeds and takes the key out of the basket. When the object is placed so that he can not reach it, he stretches himself out as far as possible in its direction.

I now put a little lath—also one of his playing materials—in his hand, catch the ear of the basket with it, and pull the basket in this way in his direction. Left to himself he does not try to imitate this, not even after repeating the process. After once more putting through, he succeeds by a jumping movement, although he is bound to his bed by a string, in reaching the basket. Before he gets the key out of it, I take off the basket, and rattle with it. His attention is in this way highly increased, he jumps for pleasure and makes incoördinate movements in the direction of the replaced basket. The putting through is again repeated. For a moment he takes up the lath, and makes a movement with it which suggests a pointing in the direction of the basket; after that he lays the lath aside. In the next experiment he throws the lath aside immediately after the putting through, and that in my direction as though he offers it to me, and shows once more his lack of power of understanding in jumping and making incoördinate movements in the direction of the basket. Several times already he has felt that this is not the right way to reach it as he is bound to the string. After the eighth repetition of the experiment it seemed in the beginning as if he imitated with understanding, he stretches the lath out in the direction of the basket. Instead of pulling it in his own direction, he drops the lath which remains lying on the basket. In this way it appears that the originally intelligent reaction must be reduced to an accident. After the ninth putting through his attention weakens for a moment. He plays with the lath but immediately throws it aside when by rattling, his attention is once more fixed on the little basket. He jumps and makes incoördinate movements in the direction of the object unattainable in that way. Not only now but in other experiments which were carried out after a rest of half a day, he reacts completely without power of understanding or imitation. When I tried to let him use a percussion-hammer, with which the ear of the basket would be easily reached, this object in itself absorbed his whole attention.

In a still more adequate 'catching' movement, the moving of a spoon towards his mouth, he is no more able. When we move the pap to his mouth he eats it with great delight. When afterwards a dish of pap is placed in front of him, and a spoon is given in his hand, he shows no reaction. Neither does he when first the spoon pinched by his hand is moved first to the pap and after that to his mouth (putting through). Instead of using the spoon, he pushed it into the pap and leaves it there. In repeating the feeding movement, the spoon was left in his mouth. He got anxious but did not

remove the spoon. In the next experiment the spoon is left in the pap. He seizes the spoon, moves it to and fro, jumps then and makes incoordinate movements in the direction of the nurse, as if asking for food. The next time he seizes the spoon and pushes it—a very inadequate reaction—wholly into the pap. When after a few days we repeat the same experiment he is again not capable of taking the food of his own, though he proves by his appetite that the pap is indeed a desired food. In another experiment in which he has been kept hungry for a while he sits a quarter of an hour with a dish of pap in front of him and does not touch it. Imitation and understanding prove to be absent also in this series of experiments.



FIG. 3

Another experiment only a few times repeated is the handing of a glass. He does this in the right way when one stretches out his hand. That there is no intelligence involved in it can be proved by stretching out the hand vertically. As before he hands the glass and tries to put it on your hand. I have told already that the child is ambidexterous and offers his right and left hands when one offers him his hand. This reaction is most probably given without intelli-

gence and obtained by stamping in by means of trial and error. This can be proven by the fact that by bringing his hand near his feet one can sometimes provoke the reaction of "feet-shaking" (see Fig. 3).

Finally I shall still mention a series of experiments carried out in the following way. I had built a cage of cuboid shape each side measuring about 30 cm. The walls were formed of lattices measuring about one cm. in breadth with spaces between them of about 2 cm. Horizontal lattices fixed at the inside at a distance of 2 cm. from cover and bottom, solidify the whole box. One of the side-walls, built in the same way as the other ones, is a door which has a spring on the side of the hinge. In that way, the door opens of itself when a little hook at the other side is lifted up. The whole is a small edition of the "problem box" of Thorndike as I used it in the laboratory of Buytendyk for dogs. The latter however was so big that the whole animal could be put in it from above. Moreover the closure was different from that in the animal experiment.⁵

Through the lattice an object at the inside of the box can easily be seen. I put in it an object which was supposed to be desirable for Hannesje, be it a nicety which in some experiments he was allowed to taste before, or ordinary food, or a piece of his playing-goods, etc. I again protocolled minutely the reaching or not of the desired object, and also by changing the position of the box, I drew conclusions on his power of understanding and imitation.

In the first series of experiments I took as object of his desire a blotting-paper-book, with which the patient used to play. He reacts immediately, seizes the box, tries to force the lattices and knocks on the box. His hand is now placed near to the hooklet. He makes some movements thereabout, and seizes the hooklet. After that he again moves higher and forces the door above—as the whole instrument is rather delicate, a rattling is provoked in that way. After that he throws the whole box aside.

After the patient has not shown any reaction for 5 minutes the mechanism is again demonstrated, while the little idiot is attentive, as is shown by his trampling for pleasure when the door springs open. He reacts in fingering somewhere above the hooklet and pulling the yielding and somewhat moving door. Again his attention is fixed on the hooklet by our showing it. Finally he opens the door by an accidental movement upwards. That it happens accidentally was objectively proved by the fact that his eyes were looking in quite another direction. The time from the beginning till this movement was 10 minutes.

In the next experiment Hannesje fingers in the beginning everywhere but near the hooklet; after that he touches it for a moment and pushes it, rattles with the door, fingers round the corner about 10 cm. above the hooklet, and opens again by an accidental movement after 5 minutes—by trial and error, as animal psychologists say: among numerous purposeless, unintelligent (*unzweckmässige*). movements one gives accidentally the desired effect. In experiments with animals after some accidentally right movements which are followed by a reward (e.g., a piece of meat) the “*zweckmässige*” movements are selected, so that in that way the reaction gradually goes on faster and is finally executed almost instantaneously. That this learning is not due to intelligence in the human sense of the word, is proved by making a little change in the situation—for instance by turning the box over 90°. The animal now mechanically makes the same movements on the same spot. An analogous result with the patient Bernard P. in Apeldoorn (Holland) will be reported later. With Hannesje B. I had no occasion to continue the experiments long enough to provoke this effect.

When we now return to our experiments we see that our little *microcephalic* idiot, placed again in front of the box, begins with pulling the hooklet, then pushes away the box and afterwards opens the door by an accidental movement in which the hooklet is moved up by his thumb (taken along by his thumb). Time: 2 minutes. The doorlet opens. Before it is quite open, it gets entangled with his knee. He now tries to open it further, and pulls with much force without however reaching any success, as his knee bothers him. This failure to remove his knee is really the summit of “*Unzweckmässigkeit*,” of unadapted reaction. After a moment he drops away his knee, but apparently again without intelligence, because in the next experiment the same thing is repeated with his other knee. The next time he plays with the whole box. It is now turned over 90°. He fingers with little preference on the spot where the hooklet was before, but then he pushes the whole box aside. After 10 minutes there is no success. After that the box is again placed as before; the mechanism is demonstrated and Hannesje succeeds. The next experiment however reduces this seeming imitation to an accident—though a beginning of learning by trial and error may have had some importance. The mechanism is again demonstrated, after which he pushes the hooklet from above, and fingers above it. The mechanism is still twice demonstrated, but the patient is no more attentive and does not react.

After two months, I again took up my experiments with the box. In the meantime the above mentioned experiments were carried out. Perhaps it would have been better to take up the experiments with the little box more quickly, as in reading the protocols of the first series, a beginning of learning seemed not to be improbable.

The following series was begun by opening the box by putting through. A piece of his playing goods, a little basket, lies in the inside. After closure the patient makes groping movements with both hands at both sides of the door, makes after that numerous accurately protocolled "unzweckmässige" movements and does not succeed in opening the box. Seven repeated experiments varied with "putting through" and fixing more strongly the patient's attention by placing a key in the box through the cover, have no other success than sometimes it accidentally opens. There is no question of learning. After this, some accidental openings unsuccessfully again follow, so that putting through is once more applied.

After some days it is again repeated, and Hannesje immediately takes hold of the hooklet. The explanation of this may be either a trace of learning or a playing by taking hold of a strange object. That he does not act by reason or intelligence is proved by the fact that after touching the hooklet he takes up the whole box, plays with the lattice and with the cover. As no success is reached, again putting through is applied. Once he opens it—his finger however keeps the doorlet from springing open. That this reaction is an accident is in that way proved by his later reaction. Mostly in the different fingering movements, an "unzweckmässiges" pushing on the hooklet is carried out. There is no question of learning by putting through. After three days I again take up these experiments. Once he tries with his fingers through the lattices to take hold of the desired object—a pencil—in that way; after that he shakes the whole box. I now open the door by putting him through. He pulls the doorlet wholly open and plays with the pencil. After that he skips with the door, and finally with the whole box; and plays with the hooklet. Even when the door is open he takes hold of the hooklet, a proof that it is the strangeness of the object which attracts his attention, as I have mentioned already. I had no more occasion to study this patient. It might have given some results with regard to his learning power; I think however that the above reported 100 or more experiments prove that this patient (who by *his easily and well attracted attention*, notwithstanding the fact that as means of communication language could not be used, can easily be

examined) proves to have a *complete lack of power of understanding and imitation, and a lack of abstractive capacities*, "Einsicht," idea of proportions, adequate reaction to the most simple new situations is impossible, *as in subanthropoid animals*. The contention that we should have to do with an absolute animal mind, would be an absurdity with consideration of his instinctive disposition, affectivity, power of observation, domination of visual or olfactory sphere and so on. Only the intelligence shows an abnormality from the human mind, which means *not a quantitative, but a qualitative change, as it is a subanthropoid way of reacting*. In consequence of the absolute failing of power of understanding we get a reaction to the environment, which is in no gradual relation to the normal human reaction, but shows an essential difference.

I found some analogous cases in examining the oligophrenic population of the hospital: "Het Apeldoornsche Bosch" in Apeldoorn (Holland). About 60 patients were examined on their power of understanding and imitation. The "attention" appeared to be a factor which gave rise to a thorough study. As means of experimentation the above mentioned box was used. A desired object stimulated the activity; in higher oligophrenics the order "Please open the box" was sufficient. After that the box is turned over 90°. My way of drawing conclusions will appear later on.

For a great many of the "higher" imbeciles I could immediately conclude a high gradation of their power of understanding because they immediately opened the box with the hooklet when I ordered them to do so. In most cases when I had turned the box while they had not seen it, they understood immediately that they had to seek for the hooklet at another spot. In that way they soon succeeded in opening the box. For the performance of this opening various times were necessary. In some cases they also could easily close the box. It will appear that such a high power of understanding can not always be foreseen. In some cases a complete lack of power of understanding could be demonstrated.

A very illustrative case is the patient B. P. U., a mongoloid idiot of 22 years old, who is only able to stammer a few words. A previous experiment in his department where at dinnertime his dish with his meal is placed in a case proved that notwithstanding his apparent hunger he was not able to open the case, not even after demonstration and after one of his fellow patients had given the example. After some days I took him along to the examining-room. The patient looks about in great amazement. He had never been there before. As an example of his knowledge of language the following conversation:

"Do you like it here?" He nods "yes." Apparently he understands the question. Continuation of the conversation shows that this is not the case. "Do you think it horrible here?"—Again he nods: "Yes." "Do you think it beautiful here?"—He murmurs a sound which seems a repetition of the word beautiful. Now I give him a piece of an apple, the remainder of which is placed in the box through the cover. The side with the hooklet is placed in front of him. He fingers at the lattices, puts his finger between two of them, shrugs his shoulder. Several times I encourage him saying: "Try to get the apple," and so on. He puts three of his fingers vertically above each other between the lattices, after that 4 fingers at another spot still further from the hooklet. Now he is put through, after that I ask him to give me the apple. I stretch out my hand and he lays the fruit into it. In the next experiment he acts as purposelessly (*unzweckmässig*) as before. Again he is put through and rewarded with a piece of an apple. With some humming sounds he expresses his contentedness. Then I shut the box while he sees it. I say: "Give me the apple" and stretch out my hand. He reacts by poking one finger through various spaces. Accidentally he touches the hooklet and reacts immediately by pushing it down from above. Having no success, in that way he continues his way with his finger one space from that of the hooklet, then three spaces further on. He looks now desperately in my direction and to each urging he reacts by putting one finger sometimes above sometimes below between two lattices.

Again I bring his finger under the hooklet and push it upwards. I feel that he moves actively, so I loosen his finger, the hooklet is still lifted up for a moment—after that the patient stops this right movement, and moves his finger again downwards.

In the beginning it seemed that he understood the putting through. The loosening of his finger proved that it was an accidental movement. Now I push the hooklet further upwards with his finger, hand him the apple and a knife, and ask him to cut a piece from it. He takes up the knife in an unhandy way with his left hand, places it vertically on the apple and makes a cutting movement without pressing; now he stops it and after my urging he repeats exactly the same movement. This behavior suggests to us that he is imitating a formerly observed action, *however without any understanding*; an in animal psychology till now unobserved possibility. Thus Professor Buytendyk on page 193 of his "Psychology of Animals." Imitation supposes an understanding of the action. We will have to study this more in detail and put him

through 10 successive times. The only success is that the patient chooses for his finger spaces nearer to the hooklet. There is however no question of an opening, so that for the following reaction an accident may be the cause. I take his finger, point it towards the hooklet, and keep it quietly under it. He now moves it upwards and opens. One could scarcely determine whether this is a pure accident, imitation or understanding. In the next experiment he moves his finger to an indifferent lattice, then in the space in which the hooklet is fixed. After that he moves his finger upwards and opens. Time: one minute. The order "Now shut the door" is followed by a repeated pushing to the jumping door, a fingering on the hooklet and a repeated pushing. The order "Open it" is also followed by pushing. The repeated order "No, open it" by opening. "Shut it" by pushing. "Open it" by opening. This is repeated several times and a right reaction is approved. At last he does not react to "Now open the door," but well to "Open it" and "Shut it," a proof that the difference between the two sounds first felt vaguely has become more clear to him, at least, that he reacts to them in the right way. Any "understanding of language" is naturally not proved by this experiment. By approving and disapproving he is trained on certain sound impressions—just like an animal—in the same way as the patient—or an animal—learns to react to visual impressions—without understanding.

After this "exercise in language" the experiments on the mechanism of opening are continued. He puts his finger between two indifferent lattices, repeats this and pulls on one of the lattices. Now he comes in the space in which the hooklet is fixed but wholly below, moves to another lattice, then still to another one and moves his finger upwards. After this he pushes from above on the hooklet, fingers again between two other lattices, reaches the hooklet, looks attentively in its direction, fingers above and below, and opens at last. Time: 5 minutes. Now I again shut the door, at which movement he looks attentively. He puts his second finger between the second and third lattice quite below, then on the hooklet and pushes it. Then he retracts his finger. After a renewed urging he moves his finger upwards in the first space but without enough force to open the not smooth hooklet. The patient does not continue this movement. After renewed urging he first shows no reaction, then he moves towards the hooklet and opens. He laughs for pleasure as the door springs open. Time: 3 minutes.

The order "Now shut the door" is followed by pushing the door; the hooklet is however not touched. I now shut it, while he

is attentive. After having fingered for a moment between the second and third lattice he opens. Time: $\frac{1}{4}$ minute. The order "Shut the door" is again followed by opening. In the next experiment he reacts immediately by opening. The following reac-

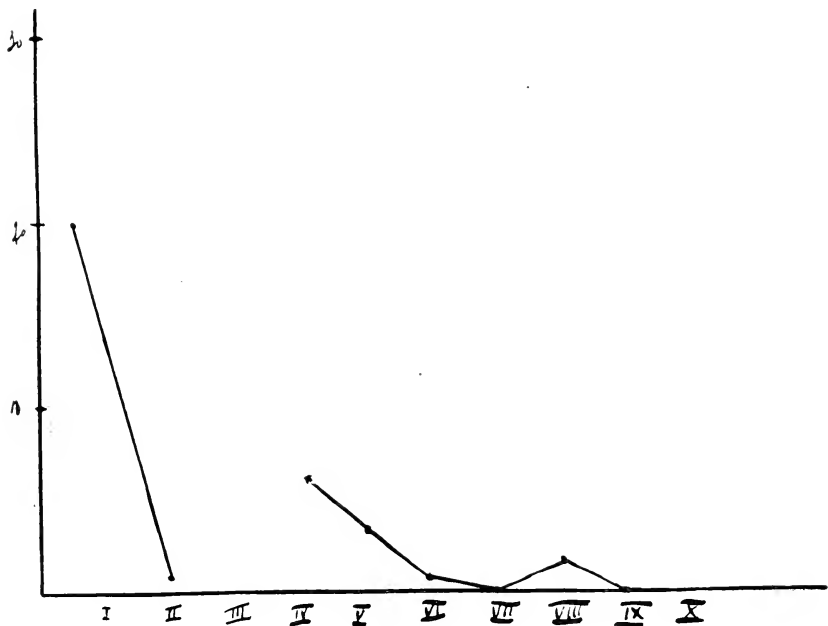


FIG. 4

tion takes again $\frac{3}{4}$ minute, because after having tried to lift up the hooklet, he pushes it down, and then gives it up. After urging he opens in the right way. The ninth experiment gives an immediate opening, so does the tenth. This is followed by "reward."

When we plot a curve of the times required for the reaction, we get the general biological curve for mnemonic processes. After a high beginning first a piece which goes down very steeply, then a gradual and slow decreasing till zero. The increase in the fourth experiment is caused by a retardation in learning in consequence of a later inadequate appearing "exercise in language" (see Fig. 4).

After this the box is turned in the horizontal plane over 90° . I point out the hooklet to the patient and make the turning while he looks at it. He now fingers several times between the first and second lattice *on the spot where the hooklet would have been but for the turning* (a behavior completely corresponding to the non-idea-tional behavior of the dogs) (see Figs. 5 and 6). After that he works at the first lattice from beneath, then at the second lattice at the top and looks at the apple. Now he comes into the second space, after that again in the first one at the top. After some time he frequently moves his finger up and down sliding along the first lattice; after that he does the same thing with two fingers several times.



FIG. 5

Then the number of times in which he visits other spaces increases; always however he returns to the old spot. After 10 minutes the box is replaced in its old position. He fingers for a few seconds in the first space beneath; after a stimulation he catches the hooklet and opens. Hereafter he opens immediately in the right way, then after a slight hesitation and finally two times without mistake. The last experiments show moreover that he had not forgotten the hooklet. *That he did not realize what he was doing* is proved by his reaction after the turning over 90° .

The next day the box is again turned after some preliminary experiments in which it was shown that he still knew the reaction.

Once more the relativity of his knowledge of language was demonstrated by the fact that he immediately opened the door after the order, "Shut the door." After the turning, his fingers move about in the first space, after renewed stimulation in the second, in the top of the first, in the middle of the first, in the top of the first, in which he makes sliding movements which naturally do not give the desired effect (every time a reaction after stimulation). "Prefer-



FIG. 6

ence" for the first space is in that way apparent. Now I remove the cover. After the first order "Open it also." *He immediately imitates this.* After that the original reaction is still three times given in the right way on the box which had been replaced in its old position. Finally one more experiment is made with the box placed inverted. In that way the hooklet which originally was at the patient's left hand is now at his right hand. Again he works at the spot where the hooklet originally was. A reminiscence of the opening through the cover is shown in his trials to open the box from above which is now naturally impossible. After the hooklet has been pointed out to him, he reacts to it, but in a way which shows his lack of understanding. He pushes it upward as before so that it is now only closed still faster. The fact is remarkable that as pointed out already in this method of stamping in or a habit not only visual but also acoustic impressions give a certain "meaning" of object or sound which provokes an adequate reaction. Finally

this happens for instance with the originally unknown word hooklet. It induces him to finger on its spot. In that way such a patient could perhaps learn an adequate reaction to the spoken word—after a long time naturally and without understanding.

Finally I once more emphasize the fact that for this patient the giving of a hand or a foot is absolutely identical.

We see here a case of a patient who according to his frequently repeated and minutely protocolled reactions shows himself to possess a *good attention* and a possibility of *imitation without understanding*. The latter appears from his reaction with the knife on the apple, and perhaps from the learning of the reaction to the hooklet, here however in combination with a stamping in of accidental successes, through trial and error, while he finally gave a very strong proof of his power of imitation in the reaction of the taking off of the cover. Moreover it is interesting in this connection, that the patient when one hands him a key, puts this into the lock and makes trial movements with it. A real opening of the door I could never observe. The patient who for years has been in the department must have learned this in the same way and have imitated this in the same way as the reaction to the knife *without understanding*. A *complete lack of power of understanding* is moreover evident.

Remarkable indeed is the patient's faculty of reacting (without power of understanding and still in the right way) to words and to the learning of actions without insight, most probably through the combination of "trial and error" and imitation without understanding.

As told already the greater part of the patients appeared to be able to give the reaction immediately or after a moment's thinking. In several cases they give already "prima vista" in their daily life the impression of presence of power of understanding. This is however not always the case. A striking example is the following case.

The adult man M. N., 38 years of age, is a completely unsocial patient, who lies the whole day in his bed. Especially when the weather is cold he tears his clothes into pieces. He can not speak, a defect for which no neurological lesion of the center nor another traceable reason could be found. The principal source of pleasure he finds in a repeated beating of his head, a grin of delight appears then on his face. The same is the case when he succeeds in catching the hand of somebody who goes along his bed, and pressing it. Every day exactly at 12 o'clock he abandons his quietness, leaves

his bed, jumps into it again, settles himself at the door with glass windows which opens into the corridor while he frequently beats his head and breast. This is the hour on which the attendant brings him a cup of coffee. As soon as he has taken hold of it, he starts again to his bed, lays himself down and drinks till he is satisfied. Such a patient suggests a very low intelligence. We now place, at dinner time, his plate with pap in the box and shut the doorlet. To our great astonishment he immediately discovers the hooklet (after having taken hold of the box in an awkward way) and opens it. We now turn the box over 180° . The patient turns after that immediately, first 90° too far, then in the right way and opens it directly.

This patient has moreover a certain feeling for order and cleanliness. When for instance he has wasted crumbs on his bed, he carefully removes them. Neither is he unclean and he eats his pap with a spoon. When we take away his spoon he does not eat, though he is hungry, which is shown by the fact that he eats the pap with eagerness after the spoon has been given to him again. As a parallel experiment I asked one of the "higher" imbeciles (which means in this case one who is able to speak) "What would you do when you were hungry and we took away your spoon?" "Well, I would bring the plate to my mouth!" was the answer.

Two months later I made a few more experiments on N. The closed box, in which I placed an apple, is put in front of him. He immediately opens and seizes the apple. In his absence the box is now turned over 90° and again placed in front of him. He gropes for the box, *seeks apparently the hooklet* till he finds it, after that he opens immediately. The apple while he looks at it is now put in the box through the cover. Notwithstanding that he immediately opens the side door. All this shows a reaction with insight and is in apparent contradiction with the behavior which dogs showed in analogous cases, when they had learned by "trial and error" that they could escape from the problem box of Thorndike by treading upon a double planklet—in that way they made an electrical contact and opened the door. When now the dog was brought into the box while the door was open, he did not go out immediately, but first treads upon the plank, etc.

Some weeks later the patient is once more brought in front of the box and reacts again with full intelligence. Even when the box is inverted he opens *and shuts* it immediately.

We have to do here with a patient who is mute in consequence of his inability to hear, who lacks the power of speech, the "bridge from one soul to another" and lives therefore a kind of primitive

life, absolutely independent of and in contradiction with the norm of human society. He seems to be a very low idiot, but his power of understanding appears to be completely developed. This consideration could appear to be of practical advantage, because perhaps it would pay to teach some business to such a patient who appears to be not of a low intelligence. With the present case this can however not be done because of his very unsocial behavior (tearing his clothes into pieces, stealing, etc.).

An analogous case is the 8 years old, completely deaf-mute patient M. v. A., who is also considered to be a very low type of idiocy. In our experiments it is rather difficult in the beginning to fix his attention on the hooklet; after being shown 5 times however he completely knows the mechanism. His good power of imitation is shown by his trials to open the box by the cover with which he saw me working. His good power of understanding appears from *a shutting of the hooklet spontaneously in the right way*, the immediate opening of the box when it is inverted, and his reaction after the box has been turned over 90° . After having taken some trouble to get hold of the apple by bringing his fingers between the lattices he seeks for the hooklet and opens immediately in the right way.

Also in this case a simple experiment shows that it would pay to try to educate such a patient. The child was deaf and mute from its birth; in consequence of bad economic conditions of the family no one has ever paid attention to him. In that way it is possible that its idiocy is only seeming and that its antisocial behavior is only the consequence of the latency of the completely isolated child through his lack of power of speech and hearing. In such a case an experiment in the direction of correction is very desirable when power of understanding appears to be present. This patient would after the investigation above described certainly have been sent to an institution for deaf-mutes if it had not been for his regular uncleanness, which was a contraindication for that. We had no occasion to work out these two cases and those described in the table on page 34 as to individual therapy. However the higher possibility for certain classes of mute patients is demonstrated. A closer investigation of this question would be very desirable.

Till now I only discussed a few examples of oligophrenics, who showed intelligence, whereas this was absent in another category. In that way we saw a distinction between two groups which showed in their reactions to their environment a not gradual but essential difference. The first group reacts in a way which represents a be-

havior which was perhaps quantitatively low, but essentially corresponds to normal human action. The second category has relations with its surroundings which are essentially different from normal human behavior and *can without restrictions be compared with those of subanthropoid animals*. That this does not mean a complete identification with the animal psyche is evident when one takes into consideration the affective, instinctive and sensory components which also build up the psyche.

When we call the first group imbecility and the second one idiocy, we get a subdivision of idiocy, which does not show the disadvantage of the gradual one now prevailing, which is very vague. (See for instance the textbook of Kraepelin, in which the present distinction between idiocy and imbecility is called an arbitrary one.)

Moreover we saw two gradations of idiocy in our examples. The first one showed the following complex of symptoms:

Attention *pos.*; power of imitation *pos.*; power of understanding *neg.* (patient B. P.).

We call this complex: *idiocy of the first degree*.

The second degree of idiocy shows: Attention *pos.*; power of imitation *neg.*; power of understanding *neg.*, whereas imbecility can be represented in the following scheme:

Attention *pos.*; power of imitation *pos.*; power of understanding *pos.*

There is however still one more group. They show a seemingly complete lack of attention. On the whole we found three examples of this type. The first one is G. Z., 4½ years old. It is a completely helpless mongoloid little idiot, who according to his record "has no notion of playing and of taking hold of objects which are shown to him." Helpless as a baby it lies in its bed; it can neither go, nor stay, nor speak. In our experiments it was impossible to fix his attention on the little box. A piece of chocolate is shown to him, he shows no reaction. When we put it into his mouth, an eating reaction results. After that a piece of chocolate is put into the box. Even after 15 times illustration he does not show a trace of reaction.

An analogous patient is the 2½ years old B. van H. His record says that since his birth he was inhibited in bodily and mental development. He is still absolutely helpless, is not able to stand, neither to sit, does not understand anything of what one says, has no notion of playthings and is incontinent. With him the experiments give the same negative result.

The third case is the 21-years old S. B. She also shows a complete absence of spontaneous reactions, and sits the whole day

motionless in her chair. In the records of the madhouse's Heerenloo where she was nursed ten years ago it says:

"A weak girl who does not play but moves purposelessly in the room. She speaks very little; only about herself and what she would like to have. As she is not fit for mental development she does not understand what people say."

According to Dr. Lobstein she formerly showed traces of attention. Her present condition is perhaps due to the fact that she is epileptic. This case is in that way not impure. Epilepsy may give rise to restriction of attention. Where the causes of the other cases are perhaps analogous their nature—I mean in non-epileptic restriction of attention—has not yet been investigated.

In the beginning I supposed that this group was again essentially different from idiocy. I considered calling this group sub-idiocy. Closer investigation however showed that the restriction of the attention is only seeming, and appears where new impressions of objects which are not known as parts of a complex already learned are concerned. In studying the eating-reaction I observed the following facts:

B. v. H. does not react when a piece of chocolate is shown him. When however the sweet-meat has touched the mucous membrane of his mouth he shows a reaction. Nevertheless he is not blind because when I move my hand quickly in the direction of his eyes, he blinks his eyelids. When one shows an object to him he does not follow it with his eyes. After his organs of taste have made acquaintance with the chocolate several times, he makes *a lingering movement with his head in the direction of a piece which is held above it*, without however reaching it. In the next experiment he does not show this reaction with his head. Then a little piece of chocolate is placed on the red of his lips (the patient is lying horizontally in his bed). By repeated indirect shoving movements of his tongue he succeeds in swallowing it.

In the next experiment the piece of chocolate is first held above the mouth. The reaction consists in an opening of the mouth before the chocolate has touched the mucous membrane. As the first lingering movement this can be: (1) due to attention, (2) an immediate reaction to visual stimulation, (3) the same through smell sensations. The third alternative is made probable by the fact that the reaction is only obtained when the piece of chocolate is very close to the mouth (less than 5 cm.). The same fact makes the second alternative improbable. Now the piece of chocolate is placed higher on his lips, not on the red portion. Even now no reaction is

obtained, the third alternative is made very improbable by this fact. A possible explanation of these reactions is the following: As the patient has always been fed by means of a spoon, he must learn by trial and error to react to stimulation of the red mucous membrane by movements of tongue and mouth. When the stimulus is applied on a spot above the red, an associative reaction appears to be absent; this is a striking proof of the absence of the function of understanding. A reaction of the hands (e.g., a catching of the piece) was moreover completely absent.

No experiments could be made on the patient Gerrit Z. with chocolate. He does not react when shown the piece and when one puts it in his mouth he simply spits it out. For that reason I studied his normal behavior at dinnertime. When the spoon with pap is close to his mouth he opens it even before it touches his lips. *When the spoon is held at the left of his mouth he moves his head to the left*, when the spoon is held at the *right* a corresponding reaction to the *right* appears. The patient Fietje B. reacts in absolutely the same way.

Though these three patients are absolutely without attention as far as "new impressions" are concerned, they show in their eating reactions—i.e., in long previously learned mechanisms connected with strong sensory stimulation which are related to an elementary function—a behavior in which one would scarcely deny a certain attention. The desired effect, the reaching of the food, is however not reached; power of understanding is completely absent.

From the practical point of view their behavior is scarcely more than a vegetatively living without any attention. When we continue our analysis however we may not maintain this hypothesis of complete lack of attention. The establishment of a new group is for that reason not justified; we may however call it a separate category within the group of idiocy. We call this category idiocy of the third degree.

Power of understanding is, as shown, absent. Power of imitation is not stated and a priori inconceivable where no attention is paid to new impressions.

From the point of view of the psychologist it is remarkable that the attention—according to Wundt an undivisible elementary function—could be analyzed into two separate capacities: (1) one for new impressions, (2) one for impressions connected with mechanisms which have been stamped in. The first one I call essential, the second primitive attention. When we now, after having established

our new types and groups, study our 60 patients, we may tabulate our results as follows, the patients indicated with x having been mentioned in the text.

SPECIAL REMARKS WITH REGARD TO THE INVESTIGATED PATIENTS
MENTIONED IN THE TABLE

- No. 3. Is mute.
 No. 6. Knowledge gathered in the school: $2 \times 2 = 4$ or 6 .
 $3 \times 2 = 8$. Is the servant of the house.
 No. 8. Epileptical, mute.
 No. 13. After the turning he makes the observation: "Now I can not do it."
 No. 16. Second experiment after long deliberation.
 No. 19. After turning over 180° he shows no reaction within 5 minutes. With 90° he sees the hooklet and opens. He understands in that way the meaning of the hooklet. I doubt if he understands the turning.
 No. 23. Result after 25 reactions (see later on).
 No. 27. Does not speak.
 No. 28. Does not speak.
 No. 34. After 28 reactions.
 No. 37. Speaks in a defective way.
 No. 38. The same.
 No. 42. The same.
 No. 43. Does not understand the turning while the meaning of the hooklet is understood.
 No. 44. The same as No. 37.
 No. 45. The same. Reacts once (plate with pap in the box), then he refuses further investigation.
 No. 46. Deaf-mute.
 No. 51. Mute.
 No. 55. Stops very soon, has a bad visus.
 No. 56. Mute.

From this table it appears, with the aid of which one can immediately make his diagnosis, that of the 59 investigated patients—I exclude the case of the epileptic woman—there are:

Imbeciles	48
Idiots of the first degree	1
Idiots second degree	7
Idiots third degree	3

In this investigation "en masse" a method has been used which is advisable for the practical use of our scheme. When no reaction

Patients	Oph in an Intelligent Way	The Same After Turning Over 90°	Power of Understanding Absent	Power of Imitation Absent	Essential Attention Absent
x 1 H. B.			■	■	
x 2 B. P.			■		
x 3 M. N.	■	■			
x 4 M. v. A.	■	■			
5 S. G.	■	■			
6 A. E.	■	■			
7 L. Dr.			■	■	
8 Br. Bl.	■	■			
9 L. Bl.	■	■			
10 J. M.	■	■			
11 J. H.	■	■			
12 A. H.	■	■			
13 J. E.	■	■			
14 L. H.	■	■			
15 A. S.	■	■			
16 A. D.	■	■			
17 M. S.	■	■			
18 A. v. M.	■	■			
19 J. v. M.	■	■			
20 J. B.	■	■			
21 Gr. V.	■	Closes spontaneously; will be mentioned later on.			
22 Fr. d. M.	■	■			
23 M. G.			■	■	
24 D. Sl.	■	■			
x 25 G. Z.			■	■	■
x 26 B. d. H.			■	■	■
27 D. W.			■	■	
28 D. d. M.			■	■	
x 29 F. Bl.			■	■	■
30 R. D.	■	■			
31 M. S.	■	■			
32 M. G.	■	■			
33 M. L.		Beats the doorlet into pieces.			
34 B. G.			■	■	
35 C. P.	■	■			
36 R. P.	■	■			
37 L. Kl.	■	■			
38 S. d. V.	■	■			
39 A. B.	■	■			
40 Cl. v. d. V.	■	■			
41 C. G.	■	■			
42 L. N.	■	■			
43 H. d. V.	■	■			
44 A. d. V.	■	■			
45 A. G.	■	Refuses.			
46 A. P.	■	■			
47 J. H.	■	■			
48 V. D.	■	■			
49 M. H.	■	■			
50 M. I.	■	■			
51 S. S.			■	■	
52 M. v. B.	■	■			
53 A. S.	■	■			
54 I. Z.	?	?	Case complicated by epilepsy.		
55 J. V.	■	■	 Idiocy of the first degree.		
56 A. W.	■	■	 Idiocy of the second degree.		
57 S. M.	■	■	 Idiocy of the third degree.		
58 M. d. J.	■	■			
59 S. J.	■	■			
60 B. G. d. V.	■	■			

Imbecillitas. Idiocy of the third degree.

was obtained after 25 experiments—including demonstration and illustration—it was supposed that essential attention was absent and when after 25 experiments no reaction was obtained with the desired effect I concluded that power of understanding was absent. We feel justified in doing this because it appeared in the protocols that of the cases not specially mentioned in the text gave the reaction in the right way:

At the first reaction	38
At the second reaction	4
At the third reaction	3
At the fourth reaction	2
At the thirteenth reaction	1 (the patient G. V.).

The rest did not yet give a reaction at the 25th experiment. We then assume that practically spoken even when the experiments were continued longer no success would be reached. The above mentioned figures give us the right to draw this conclusion.

The first reaction in these cases consisted of the order: "Open the box" for patient understanding a language, of a placing of the patient in front of the box in which some desirable object has been brought previously in the case of a deaf patient; the second reaction was a demonstration; the third an illustration.

When we study from the protocols the case of G. V., a 3½ years old, not yet speaking child, we see that the first reaction in which a desired piece of his playthings is placed in the box, shows a pulling of the door. Accidentally it gets hold of the lattice to which the hooklet is fixed. The thumb is moved upward and the door opens. The second experiment shows an analogous result. One gets the impression that all this is due to accident. This is proved in the now following experiments which did not give any results in the beginning. Making him perform is several times followed by pushing on the hook from above. After the 12th reaction the attention is weakened.

A sandwich brought into the box again stimulates her. After illustrating, three right reactions at a stretch follow. In the second experiment good opening follows after turning over 90°, moreover a spontaneous shutting. We have to do here with an action which has been learned by trial and error in connection with imitation and which is finally understood. The delay in learning is probably due to the fact that in the beginning an object not sufficiently adequate was chosen which did not induce enough interest for the opening. We see that in most of the cases the right reaction is obtained very soon when power of intelligence is present; this at the other hand shows the simplicity of the problem. The limit 25 reactions is for

that reason very wide. Moreover this limit has been trespassed in the cases which have been mentioned in the text and on which the principal conclusions are based. Moreover the reaction has been varied in many ways in those cases. In the cases B. W. and G. W. this limit has also been trespassed while no power of understanding appeared.

After I had finished this study Prof. Dr. L. Bouman was so kind as to call my attention to a paper of Erich Stern, *Der Begriff und die Untersuchung der "natürlichen" Intelligenz*, (8) in which also comparative-psychological methods (variations of the already mentioned experiments of Köhler on anthropoids) have been utilized for oligophrenics.

In the theoretical considerations this paper has the merit of pointing out some mistakes frequently made of the usual psychiatric intelligence tests. As an example the following: Conclusions are based and an examination is made on purely theoretical questions like: "What is the difference between a step-ladder and a ladder?" It is possible however that a person not being able to formulate the difference still possesses enough practical knowledge to distinguish between the two and to use them in the right way. This however is never tested out. They only study the theoretical intelligence of which the answer to a question must give the proof. Nevertheless the practical intelligence is much more important for the determination of the practical use of the patient. Moreover we mostly determine only his "Mindestleistungen," the lack of results, in comparison with those of another individual of the same age. In that way we make the mistake that we never determine separately what is present in the patient's soul and what has been learned later in his life.

Besides these important theoretical remarks the experiments and results of Stern have to my opinion only little value. He applies "lebensferne" and "lebensnahe" variations to the experiments of Köhler. Problems are proposed regarding: making a detour, use of an easily available object, taking hold of an instrument, choice of an adequate instrument, construction of an instrument, (e.g., the well-known fitting together of two pieces of an angler's rod; making a heap of several objects to reach a high object) the removing of obstacles and the use of instruments for the latter purpose. A whole of gradually different actions in that way in which the fundamental difference, power of understanding or not, is not studied. For that reason he is obliged to mention the great number of varia-

tions in *external* circumstances which is possible in each reaction as separate unit, so that he gets about 40 points to which attention must be paid in the different groups.

Moreover he only studied the group which he called imbeciles and all his patients can be reached by words. His conclusions are, several times, superficial and from the standpoint of the comparative psychologist intolerable (e.g., when he draws his conclusions from one reaction). As an example of a superficial final conclusion may be cited that he gives as a final result that of 16 persons subjected to an experiment 9 could not find the solution at all, 4 only with aid and 3 spontaneously, of which two after a long deliberation.

In the first place it is very ambiguous if this would appear to be true when the experiments were repeated, in the second place Stern never comes further than to immediate evident data. From these one is supposed to draw his conclusions, but this is never done. Nevertheless the trial to study the primary qualities of the individual instead of the learned reactions as was done till now has its merit. More than a trial *the work of Stern* is not. He himself also states that a more extensive investigation with a greater material is desirable in order to make up a set of gradual tests for the higher degrees of the oligophrenics. The work of Stern touches another field than my investigations because I strongly emphasize the investigation of the very low degrees of imbecility which had not yet been investigated before. (As an only superficially mentioned variation of imbecility I pointed out how some individuals appeared to be able to open the box after the turning because they accidentally saw the hooklet or because they immediately went to seek for it.)

As a very striking example of the difference of "natural" and "learned" intelligence the patient A. E. (No. 6) may be cited. The reaction with the little box is immediately given by him, moreover he is the servant of the house and is one of the very few patients who has a key of the house—for his "work." His theoretical knowledge is nihil, $2 \times 2 = 4$ or 6, $3 \times 2 = 8$. He is not able to read, neither to write. In our terminology we would say that his power of understanding is very high, but that the part of his knowledge which can be reproduced in language is minimal.

When we now summarize, we get the following:

RESULTS

1. In the present investigation the methods and "Erklärungs-methoden" of comparative psychology have been used.

2. As in neurology comparative anatomy is applied in the same way the application of comparative psychology in psychiatry gives good results.

3. This comparative psychological method gives a means of investigation without language.

4. Its application has enabled me to investigate the very lowest degrees of intelligence. This had not yet been done in psychiatry till now.

5. In this way I discovered the lowest form of oligophreny which is characterized by its lack of power of understanding.

6. The representatives of this group are as far as their behavior toward their environment is concerned comparable to sub-anthropoid animals.

7. When we call this group idiocy, we make a distinction between idiocy and imbecility which is based on essential and qualitative features and not on gradual and quantitative differences as was the case till now (see also 10).

8. In the experiments the possibility of imitation without understanding which had already been observed in animal psychology was again stated.

9. The attention could be divided into essential and primitive attention, the former for new the latter for stamped in mechanisms.

10. The group which has been called idiocy can be divided into three degrees with the following features:

Idiocy of the first degree: Attention *pos.*, power of imitation *pos.*, power of understanding *neg.*

Idiocy of the second degree: Attention *pos.*, power of imitation *neg.*, power of understanding *neg.*

Idiocy of the third degree: Essential attention *neg.*, power of imitation *neg.*, power of understanding *neg.*

11. The features of imbecility are: Attention *pos.*, power of imitation *pos.*, power of understanding *pos.* The different degrees of imbecility (and of debility) are characterized by gradual differences in the power of understanding and form quantitatively different modifications of a qualitative complex, which is identical with the normal human intelligence. The work of Stern moves in this domain.

12. Part of the mutes and deaf-mutes appear to be of the group of the imbeciles.

13. In this way therapeutic possibilities are given for this group. They appear to respond to normal human learning methods.

14. The way of learning of the idiots is that of trial and error. In some of them this can be combined with power of imitation without understanding.

15. In this way of learning certain objects or sounds get a certain "meaning," which gives rise to a selective reaction. This can perhaps be adapted in teaching them simple work which can be carried out without intelligence and to react in some way—without understanding naturally—to the spoken word.

16. As a method of differential diagnosis which gives immediately concrete facts with regard to their power of understanding and enables one to draw quickly his conclusions for the prognosis, the above described box can be used. This method has moreover the advantage of being applicable beyond the limit of language.

17. The diagnosis of lack of power of understanding may be made when a patient reacts 25 times at a stretch without reaching the desired result to demonstrating or putting through. Lack of essential attention after the patient does not show any reaction after 25 trials in which a bait (chocolate, etc.) has been used.

18. A very demonstrative symptom which some idiots show is the identity of giving hands and feet.

August, 1920.

EXPLANATION OF THE PICTURES

FIG. 1. The idiot can not reach the desired object because he does not understand that he can use the chair. He hangs himself lingeringly on the rim of the bed—the summit of "Unzweckmässigkeit."

FIG. 2. A normal little girl, $\frac{1}{2}$ year younger than the idiot, understands that she can reach the bed and in that way the piece of chocolate in making use of the chair.

FIG. 3. The little idiot gives hands, . . . but also feet.

FIG. 4. CURVE (See p. 15).

FIGS. 5 AND 6. The patient has learned to open the box by means of the hooklet. When the box is turned over 90° —in that way the hooklet is near *A*—the patient reacts on the old spot where the hooklet was when the stamping in of the habit took place.

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ANALYSIS OF A CONVERSION HYSTERIA SUPERIMPOSED ON AN OLD DIFFUSE CENTRAL NERVOUS SYSTEM LESION¹

BY PHILIP R. LEHRMAN, M.D.

NEW YORK

Symptoms of hysteria when associated with organic neurological signs² are often difficult to detect. This combination, not seldom, appears to be a definite syndrome of an organic nervous disorder. If the subsequent management of such a case depends upon the prognostic regard of a particular syndrome, it may often times be wrongly considered a hopeless condition. It is therefore important to recognize hysterical elements which may thus group themselves in a clinical picture, for these may be influenced favorably.

An application of a more elaborate technic is necessary for the diagnosis of hysteria in such a situation. Neither search for so-called stigmata,³ nor superficial inquiry as to motive, can be relied upon, for both of these are equally inadequate and evasive. To look for causes in the conscious levels is entirely misleading, for hysterical symptoms are unconsciously motivated, and only a complete analytic investigation can reveal the underlying mechanism of these symptoms.

The case in point follows:

CASE REPORT

Present Illness: Miss R. R. (No. 26716),⁴ 23 years of age, came to the Vanderbilt Clinic on November 21, 1919. The disabling feature of her illness was a coarse irregular intention tremor of both hands and fingers, which began when she was 12 years old and which seemed to be getting worse, in spite of treatment at various institutions for the past eight years. At one hospital, where she underwent several operations for a deformity of her feet, she was diagnosed "Pronated Feet and Friedrichs' Ataxia." The tremor so incapacitated her that she could not use a spoon or drink from a cup

¹ Read before the New York Neurological Society, March 1, 1921.

² Casamajor, L., *The Personality of the Patient*, Journal A. M. A., Vol. 75, p. 471, Aug. 14, 1920.

³ Freud, S., *Selected Papers on Hysteria and Other Psychoneuroses*, Trans. by A. A. Brill, New York and Washington, 1920, Nervous and Mental Disease Monograph Series No. 4, Chap. III.

without spilling the contents. She needed assistance in combing her hair and in dressing herself, and was helpless in any task that required the finer movements of her hands or fingers. She wrote slowly and with difficulty; the writing was irregular, showed tremor and was often illegible. She complained of a great deal of pain, of a deep burrowing character, starting in the base of each thumb and travelling up the forearms to her elbows.

Past History: At two and a half years she fell off a high chair, following which she claims to have had a left hemiplegia and aphasia, which soon improved. But until twelve years of age she dragged her left foot and showed weakness of her right hand. This was regarded by some physicians as residuals of poliomyelitis.

Family History: Her father and mother are short of stature. Maternal uncle shows tremor of hands when writing. One sister's deep reflexes are absent. No other mental or nervous diseases in both ancestral branches.

Physical Status: The positive findings, as recorded by Dr. Oliver S. Strong, were: Height 4 ft. 5 in. Pes cavus; hyperextended fingers at knuckles; toes plantar flexed. Gait showed slight dragging of left foot. Unsteady in Romberg posture. Non-equilibratory tests (f:f and f:n) badly performed on account of tremor. Right dysmetria present. All deep reflexes absent. Babinski questionable on right. Muscle strength absent in toes, limited in dorsal flexion of feet especially on left, limited in upper extremities more on left. Present Grasset-Bychowski. Sensation diminished to touch in toes and fingers; vibratory diminished in lower extremities. Right pupil larger than left. She reacted peculiarly when a vibrating tuning fork was placed near her ears; the sound seemed to startle her and she would tremble. All other findings were negative.

ABSTRACT OF PSYCHOANALYTIC PROCEDURE

The analysis began on January 26, 1920, and ended on May 18, 1920, covering a period of about 37 hours. The course pursued was to find evidence of a definite mechanism. The problems to be solved were: Why did she develop her neurosis? Why the choice of the particular symptoms, and their meaning in terms of the unconscious? I shall present briefly the outline of the analysis, and shall record as far as feasible the patient's coloring of her story.

Events Preceding the Neurosis: She was born in a Russian village, following the death of a brother. His death was caused by her mother who threw him out and he caught cold. Her father at the time was serving in the army and until she reached the age of four she saw him but once for a short period. He then left for the United States. She was taken care of by different relatives and therefore had a "thousand fathers and a thousand mothers." One

⁴ I am indebted to Dr. L. Casamajor, professor of neurology, Columbia University, for the opportunity to study this patient.

uncle was more kind to her than anyone else and she loved him. He was both "father and mother" to her, for her mother was in business and came to see her but once a month. Later she learned that her father deserted his family. At eight years she and her mother emigrated to this country. Her father was unaware of their arrival, and he was said to be living here with "bad women," was a drunkard and a gambler. However, reconciliation between the parents took place. The patient hated her father at first sight and he showed like hatred for her. She always seemed to be in his way and he would beat her frequently. At nine years another child was born which soon died due to neglect. At eleven years her sister F. was born. She was the "mirror" of the family and much attention was lavished on her to the exclusion of the patient, who felt herself like a step child and was treated as an illegitimate child. In fact, once when she had been particularly badly treated she openly accused her mother of being an immoral woman and she really harbored a doubt about the legitimacy of her birth. Numerous incidents strengthened that doubt, "for no real mother would neglect her child." As a baby she was injured and as a result of that became a cripple. She held her mother accountable in some way for that and even suspected that her mother purposely caused the accident in order to get rid of her. When she saw how wonderfully well her sister F. was treated she decided that all her suspicions were well founded, and she suffered terribly in consequence. She was made to do the hard work and to take care of the baby. When F. was about ten months old she was accidentally dropped down the stairs by the patient. This frightened her for she knew that she would be punished for not taking more care. Her whole body was trembling with fear. The next day she was unable to write as her hands were trembling, and the teacher sent her home. This was the beginning of the tremor.

The situation at home was becoming more intolerable. Other children were born and she was treated like an outsider in the family. She resorted to day dreaming. She fancied being away from home, imagined the school principal would take pity on her and adopt her, or that some old millionaire would have sympathy with her while in an automobile accident where she would be badly hurt. Or she would be caught making an attempt at suicide in some fashionable neighborhood. Once after some quarrel at home she went to the Y. W. H. A. and asked them to take her away. After she left there she indulged in the following day dream: She saw an old man there and he got interested in her and gave her a position as companion.

He took her in his car to Long Branch, introduced her as a servant but did not treat her as such. He had sympathy with her and gave her fine clothes, and she ate at the same table with him. She then overheard the other servants gossiping about her going to bed with him, and she decided to leave. He pleaded with her to stay but she would not listen to him. He took her home in his automobile and she wept bitterly over her lot.

Of interest was the manner and style of her narration. In the major part it suggested a story of a complaining twelve year old child. This age level was simulated by the inflection of her voice and her phraseology. If one were to listen to her with eyes shut, one could have easily mistaken her for a child. But at times a sudden change was striking. From a tender emotional child she would change into a swearing ill-mannered adult, and would then assume an emotional stupidity, a sort of Ganzer syndrome on the emotional level. This latter self was mainly hidden, and for the most part she lived as a child of twelve, acted as such and reacted to her environment in that fashion.

It was readily seen that all her day dreams were made of the same fabric, that of a suffering personality, and that the episodes were all that of the Cinderella type. It was therefore reasonable to suspect that her view of her life was distorted, and her tale spun of a material, the underlying basis of which was the predilection for suffering situations. The question suggested itself: If she could invent phantasies in which she suffers, why could she not have invented real situations in her home in which she could suffer?

We then retraced the events of her life and subjected her attitude to a more critical study. Consequently, a different view of her story was obtained. Her mother was not as bad as she had painted her, and her father was a hard working man who earned little and could not save enough money for their transportation. This caused gossip, as was usual in such small communities, and the invective against her father poisoned her mind. His cruelty toward her was provoked by herself, and she recalled many instances when she would purposely tease him until he would lose his temper, for he was not very intelligent. She recounted many such episodes, two of which were instructive. As an example of her father's cruelty she related a story about having been thrown out from a carriage while out driving in the park with the family. In the analysis the following facts were ascertained: As they were riding in the park she imagined that she had been lost and was wandering aimlessly alone until exhausted, and was finally found by a man who showed

her sympathy and took her home with him. Before she realized it, she pulled the hand in which her father held the reins, and the horses were startled. He scolded her and she insisted on leaving the carriage, and told him that she preferred to walk home rather than sit near him. She was allowed to go, but hated her parents the more for not begging her to stay. She walked along, and began to weep when the carriage was out of sight. Some sailors passed by and they were sympathetic with her but she would not tell them what had occurred. She reached home late that night.

She complained that on another occasion, she had been locked out from home on a cold and rainy night, and when she came some hours later with a patrolman the door had to be forced open. On analysis some important details were added. On the evening referred to she had had a quarrel with her parents, and then spent the rest of the evening at a friend's house. On her way back she wondered what would happen were she to be locked out, and she speculated on the event. On approaching the door it appeared to her that it was locked and she made little attempt to knock as she decided that she was locked out purposely. For many hours she walked the street and looked suggestively at different men. Some asked her if she had her own room, etc., but she did not talk and just walked leisurely. She enjoyed the entire situation till about 3 a.m. when she suddenly felt sad, and being near a police station she walked in as if exhausted and began to cry. She told her story, and a policeman escorted her home. The door was opened by turning the knob.

As the analysis unfolded the true nature of events, a different version was obtained, also, of the story about the accidental falling of her sister. She admitted that her sister's falling down the stairs might have been just such an accident as when she pulled her father's hand while in the carriage. It must be remembered that her sister F. was the "mirror" of the family, and that the patient did not share the good lot of her infant sister. It also became clear why she told such a horrible tale about her mother having thrown an infant son out into the cold. The patient merely projected on to her mother her own act of "throwing" her sister.

Her dreams furnished much material for study. Twenty-eight dreams were subjected to analysis. Some were simple wishes, others threw light on her sexual life which remained a closed book until the dream analysis was undertaken. All her dreams were an aid in elucidating recesses in her life which were not explored previously.

One characteristic statement by the patient was that she knew nothing of "life" till twenty years of age. Then a cousin, a married man, explained some things to her. She then learned what passion was, and how children were born. However, the analysis disproved this ignorance. At about seven years she witnessed "a boy lying on top of a girl in the field," and she knew enough to feel ashamed and talk to another little girl about it only "when no one listened." She formed definite phantasies about her father's libertine life, and even pictured the kind of women he was alleged to have consorted with. At eleven years she began to masturbate, about the same time that her menstrual flow began. On many occasions during the analysis it was evident that she had leanings towards prostitution. This was veiled, but when I apprised her of this tendency, she remarked coolly, "If I were tall and not crippled I might have been so, but I could not be so being as I am." Again, by the projection mechanism, the patient accused her mother of that what she herself wished to be.

The analyses of two dreams are interesting and are reproduced here.

(Dream, April 21, 1920.) *I was in some garden picking flowers, when I saw one of my old friends with whom I seemed to be angry. He asked me what right I had to be in his garden, and then put a flower in my hand, and took me in his arms. I awoke.*

(Association:) Picking flowers with a young man who worked for her father. He was affectionate, and would buy kisses from her. He lived in their home five years and first came there when she was thirteen years old. He used to give her as much as a quarter a kiss, he would steal money from her father for that purpose. One night she awoke and found him running his hand over her body. She told him to leave her room as he did not belong there. (Associations for putting a flower in her hand:) "To give over the hands (to punish)"—was always afraid of her father's hand—"when one does not do right God gives over the hands." Recalls sitting in the park with some fellow, he tried to embrace her, and she said, "I don't like hands." At the time her sister fell down her mother yelled, "Through your hand the child will get killed"—"to keep one's hand in the wrong place" (masturbation).

Here I remarked that her hands seemed to have given her trouble one way or another, that the present trouble they were giving her was preferable to the trouble they might have given her had she continued to do with them the things she had done (throwing her sister down stairs—masturbation); and were it not for the tremor of her hands, as she herself stated, she might have been a prostitute.

(Dream, April 29, 1920.) *I was sitting among a crowd when I was asked to serve punch, not wanting to refuse I thought I may try. In doing so, I realized that my tremor was gone. In amazement I rushed to my friend and told her of my sudden good luck. Suddenly a glass broke, and the crowd cried "mazel tov" (good luck), and I joined in the chorus.*

It was not necessary to do an extended analysis of this dream. She had always felt that on account of her hands she could not get married. In the dream she gets well and this is celebrated by breaking glass, which, according to a Hebrew custom, is done only at a wedding. The relationship of the tremor to marriage is worth noting.

For her peculiar reaction to a vibrating tuning fork she could give no other explanation than that the sound suddenly heard startled her. It was the suddenness that had the peculiar effect on her. She believed that since she knew the nature of it, she would not be startled any longer, and when I tested her she reacted normally. The tremor gradually began to disappear, and on May 28, 1920, the patient reported that she was able to manicure her nails and could thread a needle. She also stated that things at home were more pleasant for her and she realized that it was she who had changed and not her environment. For the first time in many years she began to be on speaking terms with her father. She was discharged from treatment May 28, 1920, and continues to remain without the tremor, up to the present time.

CONCLUSION

It is apparent that the patient's trouble was not alone the tremor of her hands, but what perhaps was the more important, her distorted view of life. It was necessary to correct the latter, to make her view critically her inadequate reactions to certain situations of early childhood and adolescence; and not until that was accomplished did she gain sufficient insight of the motives in the productions of her symptoms and their final abandonment.

Because the beginning of the tremor had coincided with an intolerable situation at home, where she was supposedly abused, it did not necessarily follow that the alleged abuse caused the tremor. Instead we note that there was a common basis in the patient's unconscious for the alleged abuse (which was not a cause but a symptom of the neurosis) and the resulting tremor.

The forces at work were an accentuation of the sado-masochistic component⁵ with a masturbation and a prostitution conflict.

⁵ Freud, S., Three Contributions to the Theory of Sex, Trans. by A. A.

The analysis indicated the manner in which these forces began to exert their pathological effect. The patient was handicapped early in life by being crippled. She had a "thousand fathers and mothers" and, because of her condition, got more than her share of pity. Circumstances prevented her mother and father from giving her the normal amount of love. Whatever she got was from strangers who pitied her, and she sensed early that it was her suffering which made them do it. This started her "career" of suffering.

Other elements entered. At a tender age she learned that her father was supposedly consorting with bad women, and she formed phantasies about it, and herself wished to emulate that type of women. In that way she could gain the favor of her father who preferred that type. An unconscious struggle ensued, and in the reversal of the ambivalent love-and-hate emotion, her hatred for her father was established. However in her day dreams the father-image persisted; elderly men played the principal rôle.

Finally, a number of events precipitated the tremor. At eleven years she began to menstruate and had masturbatory experiences. About that time, also, her infant sister consumed all the attention of her parents. Jealousy was aroused and the "accidental" fall of her sister followed. The tremor developed the next day.

The function of the tremor, therefore, was to prevent her from doing things which she unconsciously desired. In dreams, her hands always saved her from frank sexual situations, and in the neurosis her disability performed the same function of protection. The inference from the last dream cited was, that the tremor did not prevent marriage (sexual experiences) but it replaced it. Her remark to the effect that had she not been handicapped she might have been a prostitute was significant; as was also a day dream she had of being in a house of prostitution, and a man saving her from there when he noticed the trembling of her hands.

COMMENT

Whatever conscious elements did appear in the above study, these must be regarded as apparent only to the observer, and entirely escaping the patient's knowledge. Yet a superficial viewing of this study might signalize the simplicity of the situation for the observer, and is apt to prejudice him in believing that the patient was also

Brill, New York and Washington, 1918, *Nervous and Mental Disease Monograph Series No. 7*, Chap. II.

clear on her symptoms, and consciously simulated a disease to procure some benefit sought. The latter conception is entirely inadequate, for the hysterical symptoms were a hindrance to the patient's welfare, and only when the unconscious motives were demonstrated to the patient did the symptoms disappear. Thus mechanisms which in the unconscious were able to produce symptoms, in the conscious became illogical and useless.

Society Proceedings

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MONTHLY MEETING, MAY 19, 1921
JAMES B. AYER, M.D., in the Chair

AN UNUSUAL CASE OF SYRINGOMYELIA DR. J. W. COURTNEY

DR. COURTNEY exhibited a case of syringomyelia which was the second of its type he had seen. The patient was an unmarried Syrian, 30 years of age. His family history was negative. He had been a private in the 76th infantry and had had no illnesses up to the time of the present trouble. After entering the service in 1917 he developed gonorrhoea. A Wassermann test made sometime subsequently was negative. After his enlistment he was sent to Waco, Texas, where he had to undergo long hikes in intensely hot weather. They were very exhausting and brought on a feeling of pain and numbness in the anterior portion of his right leg and right little toe. The pain and numbness would disappear on resting but the leg slowly got weaker. He remained at Waco ten months, was then transferred to Camp Logan and later to Camp Lewis where the leg was about the same. At Camp Lewis he was sick with some sort of infectious process and after that the leg was very weak. There had now appeared a superficial scar about the size of a silver dollar. This was reddish blue in color. The regimental doctor gave him something to rub in. He was discharged from the service in January, 1919. By this time the scar had spread somewhat. There was numbness in the scar but no pain. He went to work on a buffing machine in the Reo Motor Works. This buffer created intense heat, and he noticed that as it touched the scar no sense whatever of heat was felt. The sensation of cold was probably lost but this was not discovered. At the present time the scar has spread considerably, the anterior thigh and leg muscles feel very weak and the right anterior thigh feels numb. There is

pain in the anterior tibial group. There has been a suggestion of the same phenomena in the left leg.

The physical examination, recently made, shows the patient to be a well nourished and unusually muscular man (he states that prior to going into the service he could put up a 150-pound weight with the right hand). The gait is not remarkable in any way. Romberg is absent. The pupils are equal, regular, middle-wide and normal to tests of light, distance and consensuality. The fundi are normal. The facial muscles are normal. On movements of the eye bulbs to right or left, two or three nystagmoid oscillations are observed. The tongue and soft palate are normal, the spine normal in contour and flexibility. The muscles of the upper extremities, back and torso are normal throughout. The patient complains that the strength of the right upper extremity is by no means as great as it was prior to the onset of the present trouble. The heart area and sounds are O.K. The muscles of the lower extremities show no atrophy anywhere. Occasionally fibrillation is observed in a very small area in the anterior tibial region. The general strength of the extremity in question is not commensurate with the muscle volume. All forms of sensibility are everywhere preserved save over the lower anterior aspect of the right thigh. Here, in a region roughly three and one half by four inches there is a keloid formation somewhat red in color and traversed in part by veins. In this area, and for a short distance beyond its borders, thermal and pain sense is entirely abolished while tactile sense is partly lost. Muscle and joint sense are good. The arm tendon and periosteal reflexes are good. The knee and ankle jerks are present and equal but not very active. There is no clonus. The belly reflexes are good. The scrotal reflex on the right is markedly exaggerated. The plantars are present and equal but not lively.

The two outstanding features of the case are the low vertical site of the cord lesion and the fact that it is practically limited to the posterior horn of one side.

The pathogenesis is probably as follows: The hikes probably acted as a trauma, producing a hematomyelia. Then followed a gliosis, then a breakdown of the gliotic tissue and cavity formation. Oppenheim states that he has seen only three such cases. With regard to the prognosis generally in such cases Dr. Courtney spoke briefly of a particular case seen by him a number of years ago at the Carney Hospital. It was that of a woman, in whom at the time she was first seen, the disease was well developed.

He saw her again ten years later. Meantime she had borne three children. The disease had made no progress.

THE PATHOLOGY OF TRIGEMINAL NEURALGIA

DR. PERCIVAL BAILEY

The pathogenesis of the interesting malady known as trigeminal neuralgia is still unknown. In the days of peripheral operations examinations of avulsed nerves were made but the only finding at all suggestive was the so-called "beading" of the myelin sheaths reported by Mitchell and Spiller.¹ Later on, when the ganglion was removed, various reports of examinations began to appear, but of these only in four cases have they been concerned with nerves not previously subjected to operative interference. Head,² Monari³ and Coenen⁴ reported the ganglia they examined to be entirely normal. Schwab⁵ thought there was some increase in interstitial tissue in his ganglion. This was probably an error in interpretation, but even if correct is an unessential finding because no changes were found in the nervous tissues.

During the past year I have had opportunity to examine eleven ganglia from Dr. Harvey Cushing's operations, in only one of which, however, had there been no previous operative interference. Sections were available for comparison from fourteen other cases in which there had been no previous operative measures.

In the one previously unoperated case, E. P., Surg. No. 14016, age 50, the ganglion was placed immediately in 96 per cent. alcohol and stained with thionin. The specimen might have served as a model for one of von Lenhassili's plates. The ganglion cells were perfect. Neither could any pathological changes be seen in any of the other structures. Sections from fourteen other ganglia previously unoperated were examined and in none was any marked pathological change found. Three of them were fixed in formalin and stained by Marchi's method; three were fixed in formalin and stained with H. & E., and eight were fixed in Zenker and stained with H. & E. or methylene blue eosin. In the Marchi specimens considerable fat was revealed but not resembling that of a secondary degeneration. For the most part it consisted of the fat which normally increases in the connective tissues of the aged and

¹ Mitchell (and Spiller), *Jour. Nerv. Ment. Dis.*, 25, 400, 1898.

² Head, *Allbutt's System of Medicine*, vol. 8, p. 724.

³ Monari, *Brun's Beiträge*, 17, 495, 1896.

⁴ Coenen, *Archiv f. K. Chir.*, 67, 333, 1902.

⁵ Schwab, *Ann. Surg.*, 38, 696, 1901.

the dirty deposit to be found in any nervous tissue which has stood in formalin. There was no "beading" of the myelin sheaths as described by Spiller. The H. & E. specimens were examined especially for any possible increase in interstitial tissue and none was found. In the interstitial tissue of spinal ganglia as well as the trigeminal are found numerous collections of closely grouped nuclei which resemble round-celled infiltrations. They have no pathologic significance. The arachnoid may be seen at operation in some of these patients to be thickened and adherent but the same may be said of aged individuals who never suffered from trigeminal neuralgia. We may conclude, then, that the ganglia from patients with trigeminal neuralgia are essentially normal.

Eleven ganglia were examined from patients who had previously been subjected to peripheral procedure. In them also the pathological changes found were exceedingly meagre. One was studied by Marchi's method; two by the Marchi-Mallory combination of Jacob and the Marchi-Mann combination of Alzheimer; four by Alzheimer's method V on frozen sections; two by Nissl's method; and two by Billschowsky's on frozen sections and Hassin's Billschowsky-Mann combination.

In neither of the Nissl preparations was there any sign of reaction at a distance. The ganglion cells where they had not been crushed by the scissors were well-formed, filled with tigroid, the nuclei centrally situated and no increase in fat or pigment content. The Marchi preparations showed rarely the "balls" of material which stain with osmic acid as Spiller has described, but counterstaining, according to Jacob or Alzheimer, showed absolutely no reactive phenomena on the part of the Schwann cells. This finding cannot be accounted for. The material, whatever it is, lies within the myelin sheaths. There are absolutely none of the phenomena of secondary degeneration. Alzheimer-Mann and Billschowsky preparations showed rarely a swollen or distorted axone, never a fragmented one.

We may conclude that aside from senile changes in the connective tissue and parenchyma alike and occasionally reaction at a distance in the cells of the peripheral operations, the ganglia from cases of trigeminal neuralgia are normal, and after all, there is no reason to suppose that any more will ever be found in these ganglia. The essential pathological lesion in this disease must lie in the periphery. The very fact that section of the nerve trunks at the peripheral foramina stops the pain until the nerve again regener-

ates is sufficient to establish this point and after peripheral operations there is no reason to expect any changes in the ganglion other than the well-known minor ones in the cells, for the phenomena of secondary degeneration occur peripheral to the section and not central. The essential lesion in this disease must be looked for in the region of the nerve endings. The same opinion was recently expressed by Harris.¹ So far as I know the nerve endings have never been examined. Certain clinical facts are consistent with this view such as the initiation of the pain by cold air which causes reflex constriction of the skin vessels; by talking, during which the skin is irritated by superficial muscles, etc.

DISCUSSION

DR. HARVEY CUSHING mentioned as an argument opposed to Dr. Bailey's views the fact that the character of the pain, its unilateral situation, the manner of its spread, all speak against the end organs as the possible seat of the lesion. Division of the nerves as well as alcoholic injections lead to certain changes in the ganglion which may be sufficient to inhibit for a time the discharge of paroxysms. It must be said, nevertheless, that trigeminal neuralgia is much more often bilateral than is commonly observed. About a year ago all the old gasserian cases in his series were communicated with and replies were received from about 90 per cent. of the 360 cases. Possibly 4 per cent. or 5 per cent. of these patients after several years had begun to have pain on the other side. It is a curious thing that true neuralgia of this type proceeds by a definite march. It goes from first to second to third or from second to third to first, it never jumps from first to third or the reverse which would imply that the process lies in the center rather than in the peripheral nerve endings.

DR. J. W. COURTNEY saw a confirmation of Dr. Bailey's conclusion that the lesion in trigeminal neuralgia is peripheral, in certain clinical facts. He stated that, in a considerable number of cases of migraine, certain attacks were characterized by pain limited strictly to the first and second divisions of a fifth nerve, with temporary residual tenderness on pressure of these divisions. From this he argued that inasmuch as migraine results from a vasomotor ataxia, it was not unlikely that the pain in tic douloureux was the result of vasoconstriction of the nutrient arteries of the trigeminal. This notion appeared to him all the more tenable by reason

¹ Harris, Brit. Med. Jour., May 22, 1920.

of the fact that genuine tic douloureux most commonly occurs in people in whom arteriosclerosis is more or less advanced.

DR. HARVEY CUSHING, in answer to Dr. Courtney, called attention to the fact that patients with major neuralgia were often young people, some actually in their teens. A case cited was that of a young Canadian who began to have trouble when he was sixteen years old. He was practically incapacitated by major neuralgia of the most extreme type and was seen by many neurologists who could not believe that it was a true tic. This went on until he was twenty-six when he was finally operated on. This was twenty years ago and he has remained perfectly well having recently had a four years' war service.

Many of these patients show some disorder of the teeth, or an infection of the sinuses. Some of them, too, have a history suggestive of migraine but trigeminal neuralgia very rarely starts in the brow. Probably 60 per cent. start in the second division, 30 per cent. on the third division and only about 10 per cent. in the first division. When there is primary supraorbital pain one must be very suspicious of its nature.

DR. PERCIVAL BAILEY, in answer to Dr. Cushing, said that the usual march of symptoms from one branch to another was more consistent with a peripheral origin for if the disease processes were central one might expect more often involvement of all three branches. The fact that one gets only a small part of the ganglion is offset by the fact that the part always removed contains the cells of the third division which is most frequently involved.

Dr. Ayer's remark may be answered by noting that section of the nerve peripheral to the foramina will not stop the pain in luetic basillar meningitis. The origin of the pain is not identical with that of trigeminal neuralgia.

LUMINAL POISONING

DR. A. H. RUGGLES

When originally introduced in this country early in 1913, the dosage of luminal was given as from one and one-half gr. up to 12 gr. In the *Journal of the American Medical Association*, May 17, 1913, Dr. F. J. Farnell reported two cases showing toxic symptoms after the administration of luminal as a hypnotic. As far as is known there has appeared in the American literature no similar report of the toxic effects of this drug, and it is for the purpose

of again calling attention to the possible toxic effects of luminal that this case is reported.

E. G., female, aged 39, married, has always been somewhat nervous, was restless, tended to worry unduly and could not stand fatigue or excitement. Has been married five years and has had no children, on the advice of her physician. About a year and a half ago, had an attack of influenza. Following this, became more nervous and during the spring of 1920 was in bed most of the time, unable to do any work. Has continued in bed most of the time since. Her chief complaint was sleeplessness and for the nine months previous to her admission to Butler Hospital she had taken 3 gr. of luminal every night, with the exception of eight days when she tried to get on without it. During that time she slept brokenly or not at all. The luminal was given in the dosage of one and one half gr. at bedtime and another one and one half gr. when she woke up during the night. On admission to the hospital she had a slow, slurring speech and a wiping-out of the lines of facial expression. There was a muscular incoördination of both arms and legs, with a difficulty in standing alone and a slow, unsteady gait. There was no sensory disorder. There was a tremor of the lips. Pupils were large, but reacted to light and accommodation. Her deep reflexes showed no disorder. Luminal was at once discontinued, but the disturbance of speech and gait continued for about two weeks. At the end of three weeks all the above-noted symptoms had disappeared and the patient has now recovered her former degree of health.

This case seems to show that there is the possibility of toxic effects from the continued administration of luminal even in relatively small doses.

DR. WILLIAM F. BOOS stated that he had used luminal since 1913. It is a drug which must be used with the greatest discretion and if so used is very valuable. Its action is very much the same as that of all the drugs of the barbituric acid group. It is very closely related to veronal. The symptoms of luminal poisoning are similar to veronal poisoning except that they are accentuated. The dosage of luminal should never exceed three to five grains a day and it is better not to exceed three grains. A number of epileptic patients under treatment with luminal have never shown any chronic effects. At times there has been a slow, scanning speech but that was when bromides were taken in addition to the luminal. The rash which is sometimes seen is brought on by the other

preparations also. An interesting experience with veronal was with a lady who was in the habit of getting very much intoxicated and lately had been using perfume. She was given large doses of veronal, luminal, a little choral and bromides. The next morning she awakened quite refreshed but complained of the doses being too homeopathic. During that day she drank more alcohol in various forms and became very much intoxicated. The next morning she sent to the drug store for a tube of ten veronal tablets. When seen not long after she had taken seven of them, 35 grains of veronal in less than six or seven hours and she showed the symptoms that have been described as luminal poisoning. She appeared intoxicated, spoke with difficulty and her eyes had a peculiar dilated effect. She was unable to walk. Later she obtained three more veronal tablets, taking ten tablets in less than ten hours. The next morning she was apparently all right. Undoubtedly the after effects of the alcohol acted as an antidote to the drug. Had she been a normal person she might have been seriously ill as a result but as pain is an antidote to morphine so the extreme nerve irritation that she suffered, the sleeplessness and restlessness and the sense of fear, were so powerful that they succeeded in counteracting such a powerful drug as veronal. The effect on walking is very marked in all these drugs.

The main point is that the action of luminal is very similar to that of all the derivatives of barbituric acid except that it seems to be the most powerful.

A drug which can be very strongly recommended is bromural. It is very much milder in its action and is practically harmless. It is also a derivative of urea. A young girl who attempted suicide took at one sitting more than 50 tablets. She went to sleep and slept for 48 hours and then awakened refreshed. The correct dose is usually two five-grain tablets every three hours.

DR. DONALD GREGG mentioned a patient who, under luminal treatment, became quite euphoric and pugnacious and much more troublesome than before it was given. He was given luminal for about two months. The epileptic attacks seemed to be abolished but he became very hard to manage. There was no particular drowsiness or difficulty in walking.

DR. A. H. RUGGLES, in answer to Dr. Gregg's remark, stated that he had never seen the condition described. In connection with Dr. Boos's case, he referred to a case of poisoning with this group of drugs in which the woman first took 90 gr. of medinal, then

110 gr. of veronal, and then 200 gr. of veronal without any prolonged ill effects. There must be a good deal of individual idiosyncrasy in the reaction to these drugs, for there has been reported in the literature a case of death from 15 gr. of veronal.

ANHEDONIA

DR. A. MYERSON

DR. MYERSON reviewed this symptom complex which he calls anhedonia and which he describes as being made up of four principal changes. First, the disappearance or interference with the great organic sensations, second, the loss of desire consequent upon the disappearance of hunger, thirst, etc., third, the loss of the feeling of satisfaction,—that is, there is neither desire nor satisfaction,—and fourth, an increased diffusion of excitement, which tends to make the patient seclusive, self-conscious and gives rise to feelings of unreality. The etiology is believed to lie in changes of some sort, produced in the springs of desire and satisfaction, to wit, in the vegetative nervous system, the endocrines and the viscera.

DISCUSSION

DR. H. I. GOSLINE remarked that Dr. Myerson had taken certain symptoms from a number of diseases and led them back to certain psychological categories. In introspective psychology the organic sensations form one of the fundamental groups. The next step would be to work back to the enteroceptive nerve fibres, the glands of internal secretion and all other anatomical entities capable of reaction and inhibition. Here is the beginning for a rational psychoanalysis instead of an interpretative psychoanalysis.

DR. MYERSON pointed out that the condition he had been describing was a syndrome. It may be traced back as Dr. Gosline suggested to a physio-psychological and endocrine basis. All the psychoses may be traced to a physiological basis. This condition occurs in many diseases and it is the cardinal symptom in the manic depressive group. Whenever the energy content of the individual becomes disturbed this condition tends to occur. It is a basis reaction of the human to anything that interferes with his outward energy.

DR. J. B. AYER asked if a general metabolism test had been done.

DR. MYERSON replied that it had not and he doubted if anything would have been found.

IS THE FACT OF A PSYCHOTIC PERSON BEING
THE ELDEST OR YOUNGEST IN A FAMILY OF
ETIOLOGICAL IMPORTANCE?

DR. E. M. PEASE

The following study was made of cases selected from the manic depressive and dementia præcox groups, forty cases from each group and an equal number from each sex in the two groups. These two psychoses were selected because they furnish 40.48 per cent. of all first admissions to the state hospitals in twelve different states during the year 1919, according to statistics compiled by the National Hygiene Society. They also represent 25.80 per cent. per 100,000 of the general population.

As heredity forms one of the most important of the assigned predisposing causes in these two psychoses, a possible reason for this was assumed as being due in part, at least, either to immaturity of the gonadal plasm of the parents on the one hand at the time of conception of the first child, or on the other hand, to the beginning of involutinal regressive changes in the parents at the time of conception of the youngest child. As a further development of this suggestion is the possibility that the imbalance in the eldest child may be due to the instability of the endocrine glands other than the gonads in parents of immature years or in the case of the youngest to an atrophy or reduced functioning of the parental endocrine glands due to advancing years.

The group of cases studied was unfortunately very small owing to incomplete data in many of the records selected. To be more conclusive, the study should include the other psychoses, also a comparison with the corresponding group of families where there have been psychotic members. It is hoped that such data may be presented later.

The results reached were as follows: Of the whole series 27.5 per cent. were the eldest and 18.75 per cent. the youngest. The whole series also showed 30 per cent. of the males to be the eldest and 12.5 per cent. the youngest; of the females, 25 per cent. were the eldest and 25 per cent. the youngest.

Grouped according to psychoses:—in the manic depressive series, 32.5 per cent. were the eldest, and 15 per cent. the youngest. Of these 30 per cent. of the males were the eldest and 10 per cent. were the youngest and of the females 35 per cent. were the eldest and 20 per cent. the youngest. In the dementia præcox series, 22.2 per cent. were the eldest and 22.2 per cent. were the youngest; distributed as follows according to sex: 30 per cent. of males were the eldest and 15 per cent. the youngest, and 15 per cent. of females were the eldest and 30 per cent. the youngest.

Current Literature

I. VISCERAL NEUROLOGY

Lian and Cathala. VAGOTONIA AND ASTHMA. [Paris Méd., July 10, 1920.]

Twenty-one cases of emphysema subject to frequent attacks of bronchitis with paroxysmal nocturnal attacks of dyspnea are reported upon. In all the oculo-cardiac reflex was more or less markedly positive. Exaggeration of the oculo-cardiac reflex is a very frequent accompaniment of asthmiform dyspnea in bronchitic subjects, and probably of essential asthma, and that therefore asthma may be regarded as a manifestation of the vagotonic syndrome. Belladonna, which acts by paralyzing the peripheral terminations of the vagus, should be given in large doses in asthma, and in cases of emphysema with attacks.

Pese, A. PATHOGENESIS AND TREATMENT OF ENURESIS. [Jahrb. f. Kinderheilkunde, 1920, 91, No. 5.]

Enuresis nocturna was more prevalent during the war. Thirty per cent. of all the small children and 10 per cent. of the older children in a children's clinic at Breslau suffered. Twenty-three small children and eleven older children were exhaustively studied. Enuresis, he concluded, is of two types, the symptomatic and the enuresis connected with the depth of the slumber. This latter form is characterized by its persistence from birth, with slight if any intermissions, the frequent coincidence with constipation, and the fact that therapeutic suggestion has no influence on it. Sedatives aggravate the enuresis, but it can be cured usually by waking the child at intervals before he gets too deep in his slumber plus restriction of intake of fluids.

Wolff, L. VEGETATIVE SYSTEM AS FACTORS IN ULCER. [Hygiea, August 31, 1920. J. A. M. A.]

Wolff refers particularly to gastric and duodenal ulcer as a manifestation of overactivity of the autonomic branch of the vegetative nervous system, saying that Gundelfinger has reported multiple signs of vagotonia in 22 per cent. of 1,200 cases, and Bergmann found very few exceptions in which there was nothing to indicate a loss of balance between the sympathetic and the vagus systems. In Petrén and Thorling's 18 cases tested, 8 responded exclusively to pilocarpin and 1 exclusively to epinephrin, while 5 responded alike to both. Wolff's own experience

testifies that many of the symptoms for which we regard the ulcer as responsible—the pains, gastrosplasm, hypersecretion and contraction of the mucous membrane and of its blood vessels, with the consequent erosions and ulcerations which cannot heal so long as the spasmodic contraction lasts and the gastric juice flows over them—all of these might well be explained by overirritability of the vagus innervation. This assumption has more than theoretical interest as it suggests treating gastric and duodenal ulcer with a systematic course of atropin. Von Amstel has reported brilliant results in 50 cases, given 0.5 or 1 mg. of atropin sulphate by the mouth or subcutaneously, kept up daily for ten weeks. A few patients showed slight, transient, toxic action, but in all the pains were arrested, the secretion became reduced, motor function regulated and the pylorospasm subsided, including cases in which the spasm had been so severe that it had simulated a tumor. The usual ulcer treatment was given in addition, but this was of slight or no benefit in the cases without the atropin. Wolff adds that calcium treatment and electricity might usefully supplement the belladonna, and some other drug may yet be found even more potent to reduce the overactivity of the autonomic system. Psychogenic autonomic overactivity which can be reached by psychoanalysis is not known to the author.

Gallotti, A. SYNDROME OF THE SOLAR PLEXUS IN PULMONARY TUBERCULOSIS. [II Morgagni, March 31, 1920.]

Disturbances of the gastro-intestinal function in tuberculosis are not infrequently found to be accompanied by spontaneous abdominal pain, sometimes in the form of crises resembling those of tabes or lead colic. The pain radiates, and may be accompanied by vomiting, diarrhea, and a feeling of distress. The symptoms which have not received the attention they deserve and are often confused with the ordinary gastro-intestinal disturbances of tuberculosis are to be attributed to irritation of the vegetative nervous reflex arc functions of the solar plexus by mesenteritis, isolated fibro-caseous glands, or sclerosis of the suprarenals. Treatment consists in calcium therapy, and for the pain, diarrhea, and vomiting antispasmodics, such as belladonna and its derivatives. In painful epigastric crises massage should be employed.

Ascoli, M., and Fagioli. RÖNTGENOTHERAPY IN ASTHMA. [Rif. Med., July 10, 1920. J. A. M. A.]

Ascoli and Fagioli have been treating certain sluggish endocrine glands with small doses of röntgen rays, hoping to stimulate the glands to normal functioning. Radiotherapy as usually applied is to destroy and annul functioning, but their aim was to promote deficient functioning. A boy of 15 with dystrophia adiposogenitalis was given pituitary and testicle extract treatment for several months, and then the pituitary gland was given four röntgen-ray exposures at four week intervals.

The results were most gratifying, as also in a case of scleroderma in which both pituitary and thyroid were rayed, and in a case of exophthalmic goiter given two exposures of the thymus. In the latter case the pulse dropped from 120 to 100, the circumference of the neck from 34 to 31.1 cm. and the patient felt much better generally. Tentative treatment of various endocrine organs in a case of angio-neurotic edema, in three of diabetes and in a eunuchoid man of 26 failed to display any benefit. Probably some other organ than the one treated was responsible for the disturbances. In five cases of asthma, however, exposures of the pituitary were followed by pronounced improvement. In four of the cases there have been no, or very slight, attacks since; in the fifth case instead of a daily severe attack there are only two or three a week at most, and they are mild. About four exposures were made at weekly intervals. The cross-fire was through the brow and temples to a total exposure of twelve minutes with a 2 mm. aluminum filter, 3.5 milliamperes, focal distance about 45 cm., and spark of 18-20 cm. In conclusion Ascoli and Fagioli suggest that this mild action of the röntgen rays may prove useful in research on the normal function of the various endocrine glands, and to enhance the action of those which seem to prevent or check malignant disease. Four German clinicians in the last few months have reported similar radiotherapy of endocrine glands: Stettner, the pituitary, in cases of arrested development of ossification centers; Stephan, the spleen, to promote coagulation; Fränkel, recommending small doses as a functional stimulant for endocrine deficiency, and Klewitz exposed the thorax in asthma, without benefit.

Heitz. INTERMITTENT CLAUDICATION. [La Médecine, March, 1920. B. M. J.]

According to Heitz this affection, which is characterized by arterial obliteration in one or both lower limbs, is most common in males. Some races, such as the Japanese and Jewish, appear specially predisposed. It is frequently associated with diabetes or intermittent glycosuria. Syphilis is found in only one quarter of the cases. About half Heitz's patients were heavy smokers. There is fairly often a history of frost-bite of the foot. Lastly, claudication may appear after ligation of the femoral or popliteal artery. It is generally observed between the ages of 40 and 60, frequently in association with a high blood pressure, but Heitz has seen it in patients between the ages of 30 and 35 and with a normal blood pressure, or in old age. The patient complains of a painful cramp in his leg, which compels him to stop after walking a few hundred yards or less. A feeling of coldness in the extremities is also frequent. The symptoms disappear in a few minutes but rapidly return after the patient starts walking again, especially if he hurries or walks uphill, or if the external temperature is low. The cramp is usually felt only on one side, even when the lesions are bilateral, as is the rule. The

temperature of the lower limb at rest is usually, but not invariably, sub-normal. The appearance of the skin is normal as a rule in the recumbent position, but the feet generally assume a bright pink or red coloration if they are allowed to hang down for a few minutes. The sensibility of the skin remains normal; so also with the tendon reflexes, except in diabetes, where they are often weak or abolished. In severe cases there may be amyotrophy, with weakening of the faradic and galvanic reactions without reaction of degeneration. Pulsation of the dorsalis pedis and posterior tibial arteries is always abolished on the painful side and often on the other; pulsation is usually perceptible in the femoral artery. Examination with Pachon's instrument shows that the oscillations are considerably reduced in amplitude. If there is vaso-constriction on placing the feet in a hot bath, the amplitude of the oscillations increases considerably and the arterial pulsation reappears, but if the artery is obliterated the oscillations do not reappear. This test enables one to exclude endarteritis in a malingerer, and to affirm its presence in a patient who cannot give a clear account of his symptoms. It also enables the affection to be distinguished from the intermittent claudication of the spinal cord, described by Dejerine, in which the arteries of the lower limbs are healthy, but the contractions of the arteries in the lumbar enlargement are manifested by cramps in the legs after walking. Improvement in intermittent claudication often occurs after arterial ligation or gets worse as the result of end-arteritis. As the result of abstention from tobacco, galvanic baths, and a cure at Royat, the condition may remain stationary for years. The Japanese have obtained good results by the injection of Ringer's solution. Relapses are not uncommon, and in such cases a new symptom appears—namely, pain when in the recumbent position. In a few weeks or months gangrene of one or more toes develops. Complete recovery is impossible, but life may be made tolerable by partial amputation of one or more toes.

Jenny, E. THE OCULOCARDIAC REFLEX IN CHILDREN. [*Archiv. f. Kinderheilkunde*, August 31, 1920.]

Compression of the eyeball test has been conducted upon 250 children from three months to fifteen years old by this observer in Bern. Disagreeable by-effects were observed in only two cases, vertigo and tinnitus in one and transient unconsciousness in a nervous girl with asthma. The pulse slowed down in all of the tested children save in 4.4 per cent. In the negative group there were five cases of tuberculous meningitis and two of diphtheria. The response indicates that the oculo-cardiac reflex is physiologic in children. He ranks it with the knee jerk for testing the vegetative system, and especially for testing the heart, and found it particularly instructive as a control of digitalis treatment. Latent digitalis intoxication is revealed by the response to pressure on the eyeball.

Klinkert, D. CONVALESCENCE EOSINOPHILIA. [Ztschr. f. klin. Med., 1920, 89, Nos. 1-2.]

This author, who has done much excellent work on constitutional eosinophilia, here contributes a study of the blood changes during convalescence. He compares this type to the local eosinophilia which accompanies the digestive activities. Also general eosinophilia accompanies the secretion of specific immune ferments. Both are under the control of the visceral nervous system, chiefly the autonomic division. Eosinophilia accompanies also during anaphylactic shock and the crisis of an infectious disease. Postfebrile bradycardia is another argument for the connection between the immunity process and the vegetative nervous system.

Paighiez, P., and Nast, A. PATHOGENESIS OF MIGRAINE ATTACKS. [Presse Med., April 28, 1920, Vol. 28, p. 253.]

A case of migraine is discussed in connection with findings similar to those reported previously by Paighiez on anaphylactic phenomena in epilepsy. Attacks of migraine frequently precipitated in the subject by ingestion of chocolate especially with milk, were found to be averted by a 0.5 gm. dose of peptone taken before each meal. Experimental combinations were made and differential leucocyte counts taken to demonstrate any anaphylactic evidence. Normal digestive leucocytosis and no migraine were found following meals that included milk and chocolate, both when the preventive medication was being administered, and for several days after its withdrawal. After nine days, however, leucopenia was present, and typically severe migrainous symptoms followed a few hours later. A temporary actual immunity is thus seen to be obtained by the drug followed by a potential period when an attack will not rise spontaneously but will follow the action upon use of a known excitant.

Allen, F. M. EXPERIMENTAL STUDIES ON EFFECTS OF CARBOHYDRATE DIETS IN DIABETES. [Journal of Experimental Medicine, April, 1920.]

Allen reports that the injurious effects of excessive carbohydrate feeding are demonstrable in partially depancreatized dogs in the same manner as in human patients, and that when a severe diabetes is produced there is a consequent rapid progress of emaciation, weakness, and early death of the animal. When a milder degree of diabetes is produced, the result after the operation frequently depends on the diet, so that if the tolerance is spared for a time recovery may occur to such a degree that it is impossible to produce diabetes by any kind or quantity of feeding, but a second operation, removing a small additional fragment of the pancreatic tissue is necessary. In this early period it is very important to give the proper degree of carbohydrate overfeeding in order

to produce the most useful type of diabetic animals, that is, those with a permanent lowering of assimilative power comparable to the condition of the human diabetic. In the early part of the disease glucose was more powerful in producing glycosuria than starch. Admixtures of glucose given to an animal progressing toward complete recovery on a starch diet were capable of producing a helpless diabetes. This is accounted for by a difference in the rate of absorption, showing that a rapid flood of carbohydrate is more injurious to the pancreatic function than a slow absorption. But when a permanent diabetes is established, with no hope of recovery, starch brings on a glycosuria just as surely as sugar, if more slowly. From such experimental evidence the clinical deduction is drawn that even if a patient becomes free from glycosuria on withdrawal of sugar only, other foods should also be restricted. Experiments on comparisons of starch showed no significant difference in their assimilation, nor was there any extreme lowering of the carbohydrate tolerance by proteins, such as has been claimed by some authors in connection with the "oatmeal cure." As the basis for the early tendency to recovery, Allen mentions repair of traumatic inflammation and hypertrophy of the pancreas remnant, and as an accompaniment of the lowering of tolerance by excessive diet, hydropic degeneration of the islands of Langerhans.

Cameron, C. FAMILY HISTORY IN CASE OF ANGIONEUROTIC EDEMA. [Lancet, Oct. 23, 1920.]

The familial history is here given back to the paternal grandmother. In all the members the outstanding signs have been those of "bilious attacks." These invariably appeared in childhood, and at a later period, usually coincident with the age of probable puberty, edema signs manifested themselves. Both males and females participated in the transmission and were equally affected by the condition. The edema never appeared without accompanying gastric symptoms, but the gastric symptoms appeared without the edema. The onset of edema seemed to cut short a bilious attack, and in one member of the family this seemed to guarantee a longer period of immunity from such attacks. In the patient reported upon the periodicity of the attacks suggests a menstrual relationship, in other female members of the family the attacks were not so periodically disposed.

Axenfeld, Th. TONIC ACCOMMODATION. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. 51, p. 199.]

Tonic accommodation after ophthalmoplegia interna is not a rare phenomenon, but heretofore little attention has been paid to it, although this disturbance is discoverable by a test of vision, or, objectively, by means of the skiascope. Tonic accommodation may develop simultaneously with tonic movement in convergence, and, indeed, almost imme-

diately after the onset of the ophthalmoplegia interna, but it is also possible that the two muscles may show great independence of each other in regard to the tonic phenomenon. A tonic relaxation phase may develop after an accommodation paralysis, if it ever existed, has long disappeared. Tonic accommodation is revealed in a tardiness of relaxation and causes a peculiar disturbance of vision which indicates the diagnosis anamnestically. The symptom by which the disturbance is recognized is the sluggish adjustment from near vision to far, with normal range of accommodation. This disturbance is entirely different from the usual "accommodation spasm" and also from true "accommodation cramp"—a condition rarely encountered. In this latter the contraction phase is held entirely or in part and if expansion takes place it does not do so in the regular "tonic" manner. It is remarkable that where there is tonic accommodation the range of accommodation remains normal, the disturbance consisting of a sluggishness of transition from positive to negative accommodation, entirely removed from volitional control, while accommodation for near vision may be only slightly, or not at all, affected.

Garrey, W. A. THERMODYNAMICS OF NERVE CELLS. II. [Jl. Gen. Phys., September 20, 1920. J. A. M. A.]

From the magnitude of the temperature coefficients and their variation with changes of temperature Garrey says it may be concluded that the rate of the heart beat is determined by alteration of chemical processes in the ganglion cells. Carbon dioxid formation in the cardiac ganglion was found by Garrey to run parallel to the rate of heart beat for different temperatures. The conclusion seems justified that the rate of cardiac rhythm depends on a chemical reaction in the nerve cells of the cardiac ganglion and that this reaction is associated with the production of carbon dioxid since the rate of beat and the rate of carbon dioxid production are similarly affected by changes in temperature.

Bolten, H. THE VASOMOTOR-TROPHIC NEUROSES. [Nederlansch Tijdschr. voor Geneeskunde, 1920, lxiv, H 2, 2535.]

Bolten holds that the symptoms of the vasomotor-trophic neuroses point to a disturbance of the sympathetic innervation. Their relationship with other neuroses, which he connects pathogenetically with an inborn insufficiency of the sympathetic nervous system, the lability of the vasomotor equilibrium, the disturbance of the blood-distribution, and the incomplete trophic supply of the tissues, are factors which show that the fundamental cause of these syndromes must be looked for in a sympathicus-hypotonis. This theory is further supported by the fact that very good results are obtained by treatment which restores the normal sympathetic tonus. As a rule, thyroid gland preparations, given cautiously, remove the slight vasomotor and trophic symptoms that one

meets with in all neuroses. And also in the acroneuroses, where these symptoms stand in the fore-ground and form an apparently characteristic picture, thyroid treatment gives usually an improvement or recovery. Although Bolten admits that his interpretation is not in all respects satisfactory, but thinks that it is preferable to the cramp-theory which seeks for the cause of the vasomotor-trophic neuroses in an improved and inexplicable spasm of the superficial blood-vessels. [Leonard J. Kidd, London, England.]

Parhon, J. DISORDERS OF CARDIORESPIRATORY CORRELATION IN NEUROPATHOLOGY. [Encephale, March 10, 1920, XV, No. 3.]

The congestion and augmentation of intracranial pressure due to the practical formation of an intrathoracic vacuum during inspiration, may help to explain certain pathologic phenomena noted in cardiac patients. A change in cardiorespiratory correlation may be responsible for other nervous troubles, neurasthenic iron band about the head, fascicular trembling, and phenomena observed in migraine sufferers. Insufficient amplitude in respiration is observed in these neurasthenics, hence their sensations. A patient observed who since childhood had had respiratory insufficiency, presented fascicular trembling of various muscles of the body amounting almost to clonic convulsions. These were always associated with the tightness around the head. Later extra systole appeared. There was an intimate relation for him between the difficult respiration, the need of air, and the extrasystoles. Respiratory modifications bear a relation to the mechanism of affective phenomena. In migraine there also appears to be a disturbance in cardiorespiratory correlation, since there are phenomena of intracranial hypotension and of meningeal and cortical venous stasis. There is certainly an improvement on introducing deep, regular breathing. The value of menthol in the external treatment is explained by the reflex inducement of deep breathing and consequent regularization of functional cardiorespiratory correlation.

Gallavardin. ETIOLOGY OF ANGINA PECTORIS. [La Médecine, March, 1920. B. M. J.]

L. Gallavardin emphasizes the following points in a paper based on the study of 100 cases of true angina pectoris: (1) Angina pectoris is much commoner in men than in women, only seven of his cases occurring in women. It is much commoner in private than in hospital practice, only two of his cases being observed in hospital patients. (2) As regards the age, the affection may in exceptional cases (4 per cent.) occur below 40. In 24 per cent. of the cases it was found below the age of 50, in 47 per cent. between 50 and 60, and in 29 per cent. beyond 60. (3) Syphilis, although a very important, is far from being the exclusive factor in the causation of angina pectoris. In 91 cases the question of syphilis was carefully investigated, and in the remaining 9 only super-

ficially or not all, with the following results: In 32 per cent. syphilis was certain, in 5 it was doubtful, and in 63 there was no reason to suspect its existence. Even allowing for error, syphilitic infection does not appear to enter into the etiology of true angina pectoris in more than half the cases. In those cases in which angina pectoris was associated with aortic insufficiency (which according to Gallavardin is almost always syphilitic in origin) the proportion of cases due to syphilis was considerably increased. Out of 15 cases in which the two affections co-existed, syphilis was certain in 13, one of the two remaining being due to rheumatic fever. Gallavardin suggests that in addition to syphilis there are other unknown causes of aortitis, and that the predominance of angina pectoris in private practice may be explained by intellectual and emotional strain.

Haverkate, J. H. RAYNAUD'S GANGRENE IN AN ACUTE PSYCHOSIS. [Psychiat. en Neurolog. Bladen, 1920, Nos. 3-4, May-August, p. 188 (2 figs.).]

During the influenza epidemic in the autumn of 1918 a somewhat nervous girl, aged 23, of good antecedents and personal history, had fever with pains in head and in the muscles; she had attacks which her family described as hysterical. Two days later an acute psychosis set in, *i.e.*, an influenzal psychosis. There was mental confusion, flight of ideas, disorientation, and extreme motor restlessness. At the onset, the possibility of an hysterical delirium or of an organic cerebral lesion was considered, but there were no signs of these. A manic-depressive psychosis was regarded as unlikely, for the disorientation was present throughout the whole course of her psychosis, and not only at the height of the disease as in that form of insanity. A fortnight after the psychosis began, her finger-tips on both hands were noticed to be black. She recovered from her psychosis after six months, and after eight months her mummified finger-tips healed, after loss of nails. Haverkate discusses the question whether this case is really one of Raynaud's symmetrical gangrene. Certain organic causes of symmetrical gangrene have to be excluded, *viz.*, diabetes, tabes, syringomyelia, multiple sclerosis, marasmus, cardiac diseases, and lues. As a rule, there is severe pain in Raynaud's disease, but this girl had no pain in her fingers. The writer thinks that organic changes occurred in her brain and caused the psychosis, and that the symmetrical gangrene was due to localization of the morbid process, set up by the influenzal poison, in the dorsal and lateral gray matter of the spinal cord, as suggested by Oppenheim. Among psychoses, cases of symmetrical gangrene occur, especially in catatonic stupor, where the typical vasomotor disturbances of Raynaud's disease—local asphyxia and redness—are lacking. The combination of symmetrical gangrene and a psychosis appears to be rather rare. (The views of Cassirer are discussed at length.) [Leonard J. Kidd, London, England.]

Zagari, G. CHRONIC ACROCYANOSIS. [Rif. Med., August 7, 1920.]

In the two cases here reported upon a peripheral vasomotor upset was evidently responsible for the blue hands in one case. In the other, general derangement of the endocrine system was the most probable hypothesis.

Gutmann, R. B. APPENDICULAR ASTHMA. [Presse Médicale, November 3, 1920.]

The author here discusses a general visceral neurotic disturbance to which the family name reflex asthma is applied. The asthmatic attack here is related to an appendicular attack; at times migrainous, neuralgic, vertiginous symptoms accompany the vegetative nervous system upset.

Proskauer. CASE OF RAYNAUD'S DISEASE; MULTIPLE CAVERNOUS ANGIOMAS IN NEWBORN INFANT. [Deut. med. Wochenschr., August 26, 1920.]

A case of Raynaud's disease in a child of three is here reported with a favorable outcome. A hot foot-bath, although it was somewhat painful, had an immediate salutary effect. There were, however, four recurrences during the course of two weeks, all of which yielded to the hot foot-bath but to nothing else.

Souques, A., and Moreau, R. ATTACKS OF HEMOLYSIS IN RAYNAUD'S DISEASE. [Bull. de l'Acad. de Méd., July 6, 1920.]

The plurality of this disorder is here spoken of. In some cases, holding the hands in very cold water for half an hour induced a hemoclassic crisis consisting of a drop in blood pressure and general malaise, the Raynaud cyanosis and painful paresthesia. This occurred in six tests in a woman who for seven years had presented in the winter typical Raynaud's disease. In two other cases the same experiment caused a response resembling the spontaneous winter attacks.

Bircher, E. RESECTION OF THE VAGUS IN STOMACH DISEASE. [Schw. Med. Woch., June 17, 1920. J. A. M. A.]

Bircher presents evidence to sustain the importance of the neurotic factor in stomach disturbances and especially in the development of gastric ulcer. A gastric neurosis alone, without anatomic findings, may simulate completely the picture of a gastric ulcer. When the stomach has been opened up in such a case and no anatomic lesion discovered, surgeons usually conclude the intervention with gastro-enterostomy and let it go at that. But with a sagging stomach the gastro-enterostomy may entail more serious disturbances than ever, even without the so-called vicious circle, and Bircher thinks it is more logical to resect the vagus fibers innervating the body of the stomach and the pylorus region.

This will eliminate the neurotic element just as we influence exophthalmic goiter by resecting the thyroid. He tabulates the details of eleven cases in which he has done this with surprisingly favorable and permanent results. It arrests hypersecretion and pylorospasm, and the motor functioning returns to approximate normal. He has been surprised to find further that ptosis and atony also subsided. The conception of vagotomy has been rather discredited of late, but his experiences have strengthened the conception anew. The cardia is not molested, as disturbances in this region are rare, but three or four fibers of the vagus on the upper margin of the lesser curvature are isolated, torn out both distally and proximally, and cut across. He reaches the fibers on the posterior wall of the stomach, through the greater omentum between the stomach and colon, thus exposing the whole rear of the stomach, and removes in the same way the fibers entering the fundus. In one case the vagus resection was done for recurring vomiting, but as a rule the indications were excessive secretion or peristalsis.

Wiggers, C. G., and Katz, L. INFLUENCE OF ACCELERATION NERVES ON DURATION OF VENTRICULAR SYSTOLE. [Am. Jl. Phys., August, 1920.]

Stimulation of the accelerator nerves causes a marked reduction in the duration of systole. It has not been demonstrated, however, that this reduction was greater than could be accounted for on Henderson's law of uniformity of behavior and consequently no clear demonstration existed of any specific effect on the ventricular musculature. By determining the duration of systole as well as the cycle length in a slow vagal beat, Wiggers and Katz found it possible to construct a probable volume curve for each animal and from it to derive a plot of the theoretical relation that should exist between cycle and systole lengths at any heart rate if the heart, during changing nervous action, beats according to a uniform law. The conclusions are reached that the accelerator nerves have a specific effect on the ventricular musculature which operates to reduce the contraction period; and that, in view of these observations, the hypothesis that under normal conditions the ventricle operates according to a uniform mechanical law, should be subjected to further investigation. [J. A. M. A.]

Klinkert, D. MENSTRUATION EOSINOPHILIA. [Ztsch. für klin. Med., 1920, 89, Nos. 1-2.]

Menstrual neurotic phenomena are often closely related to a marked eosinophilia which this author brings into relation with a disturbance of autonomic regulation. Uric acid disturbances also occur at the same time and the whole series of interrelationships enables this author to conclude that gout, so-called, is an autonomic metabolic neurosis; *i.e.*, a metabolic vagotonia.

2. ENDOCRINOPATHIES.

Mahnert, A. ENDOCRINE MALFORMATION IN THE PREGNANT. [Arch. für Gynaekologie, 1919, 110, No. 3.]

Mahnert applied a refractometer Abderhalden micromethod to determine the presence in the blood serum of ferments against ovarian, thyroid and suprarenal albumin in a large number of pregnant and non-pregnant women. His tabulated findings by this means demonstrate malfunction of the ovaries in 80 per cent. of the pregnant women, malfunction of the thyroid in 57 per cent. and of the suprarenals in 42 per cent., the latter predominantly in multiparae. In the nonpregnant women no ferments of the kind could be discovered. He refers parenthetically to Kraus and Saudek's finding of a ferment against testicle albumin with a male fetus and against ovarian albumin with a female fetus. The material serum in his tests showed no distinction of the kind. [J. A. M. A.]

Lesné. ADRENALIN BY THE DIGESTIVE TRACT. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, June 17, 1920.]

Oral ingestion or a rectal injection of adrenalin, even in large doses (2 mg. in children aged 5-10 years or 3-4 mg. in adults), have been found by this author to have no constant action on the arterial pressure. When given in these large doses by mouth or rectum, however, he has found that the drug has a distinct effect on the signs of acute or chronic suprarenal insufficiency. The method of introduction of adrenalin into the digestive tract is of importance, for Lesné and Dreyfus have shown that the toxicity of adrenalin disappears when it is ingested. On the other hand, it remains very toxic when injected into the rectum in the same doses as when given subcutaneously. The liver, however, neutralizes the poison. Lesné recommends that rectal injection of adrenalin should be used whenever possible in preference to oral administration, as more rapid, and definite effects will be produced with smaller doses.

Polettini, B. CHANGES PRODUCED IN VESSEL WALLS BY INJECTION OF ADRENALIN. [Arch. per le Sci. med., Fasc. 1-2, 1920.]

Repeated injection of fractional doses of adrenalin, given either intravenously or intraperitoneally to rabbits, constantly obtained aortic lesions consisting in degeneration and necrosis of the smooth muscle fibers of the tunica media. This subsequently gave rise to mechanical distension followed by atrophy, rupture, and destruction of the elastic fibers, and an extensive calcification of the bones thus degenerated. These changes were found to be identical with those which occur in rabbits as the result of spontaneous arterio-sclerosis, so that it could be affirmed that arterio-sclerosis in the rabbit could be produced experi-

mentally by adrenalin. In another series of experiments Poletini painted adrenalin (1 in 1,000 solution) on the outer surface of the carotid and femoral arteries of rabbits and dogs, and obtained degenerative and necrotic lesions primarily of the muscular fibers and secondarily of the elastic fibers of the tunica media. Direct injection of 5-10 c.cm. of 1 in 1,000 solution of adrenalin into the bladder of these animals did not cause any changes in the smooth muscle fibers of the vesical wall, but only gave rise to hemorrhages due to diapedesis from the vessels in the submucosa. Adrenalin, therefore, seems to act on the muscle fibers of the vessel by direct contact rather than by the hypertension which it causes.

Lesné. ADMINISTRATION OF EPINEPHRIN BY RECTUM. [Bull. de la Soc. Méd. des Hôp., June 11, 1920.]

Rabbits can bear double the lethal dose of epinephrin if injected directly into the upper gastro-intestinal tract, but injected into the rectum the action seems to be similar to that produced by injection subcutaneously. The liver seems to modify the action of ingested epinephrin. The rectal route does not seem to have the disadvantages of the other routes.

Poster. HEMORRHAGIC SUPRARENITIS. [N. Y. Med. J., July 17, 1920.]

A man died forty-eight hours after admission to hospital for pyrexia, slight abdominal pain, and some vomiting. Physical signs, save for a moderate degree of tympanites, were absent. At autopsy no lesion was discovered except in the adrenal glands, which were practically destroyed by numerous recent hemorrhages. The diagnosis of hemorrhagic suprarenitis was subsequently hazarded (and confirmed by post mortem examination) in a patient who showed similar symptoms and signs, accompanied by convulsive seizures.

Cosmettanos, G. F. HYDROCEPHALUS AND ATROPHY OF THE SUPRARENALS. [Grèce Médicale, February, 1920.]

The patient here reported upon was a newborn child who died twenty-four hours after birth. At autopsy the thoracic and abdominal organs, with the exception of the suprarenals, were normal. The lateral ventricles were dilated and filled with fluid. Both suprarenals were atrophied and showed complete absence of the medullary substance on the right side and an almost complete absence on the left, where it was merely represented by a few chromaffin cells. The author then discusses the findings and compares them with similar ones. He says that cases of coexistence of malformation of the brain and suprarenal glands may be divided into two groups: (1) those embryogenic congenital anomalies, and (2) those in which the anomalies occur later—that is, after the

appearance of the chromaffin substance. In the first case there are no anomalies in organs embryologically related, such as the brain and the chromaffin tissue development either as suprarenal nor vegetative ganglia. In the second case some parental diathesis plays a part, such as syphilis, alcoholism, or tuberculosis, and is responsible for the congenital medullary substance of the suprarenals.

Heise, F. H., and Brown, L. EPINEPHRIN HYPERSENSITIVENESS IN DEFINITE AND IMPROVED PULMONARY TUBERCULOSIS. [Am. Rev. Tuberculosis, October, 1920.]

A study of cases of pulmonary tuberculosis and of cases in which a diagnosis of pulmonary tuberculosis had been made which showed a hypersensitiveness to injections of epinephrin was made by Heise and Brown. The epinephrin reaction was twice as frequent in the non-tuberculous as in the tuberculous cases (14 and 29 per cent., respectively). Activity of the pulmonary focus, as determined by symptoms, played little, if any, part in occurrence of the reaction. Presumptive inactivity, as interpreted by röntgenoscopy, was accompanied by epinephrin hypersensitiveness about two and one half times as often as when activity was present. The occurrence of tubercle bacilli seemed to be associated with a less frequent reaction than when tubercle bacilli were absent (10 and 17 per cent., respectively). No patient with a history of pleurisy with effusion reacted to epinephrin. As the extent of the disease becomes greater, the tendency to react to epinephrin apparently diminishes (27 per cent., 15 per cent., 9 per cent.). Tuberculosis colitis apparently does not promise epinephrin hypersensitiveness. [J. A. M. A.]

Klewitz. EXOPHTHALMIC GOITER. [Deutsch. med. Wochenschr., August 26, 1920.]

Klewitz states that at the Universitätsklinik at Königsberg non-operative treatment is not considered for exophthalmic goiter when malignant degeneration is suspected, or colloidal or cystic degeneration, or the goiter is causing symptoms from pressure on the trachea or esophagus, and in general, in old, chronic cases. The cases selected for nonoperative treatment are the abortive cases (formes frustes), the acute and subacute cases, cases with cardiac insufficiency or other complications that make operative intervention seem inadvisable, and, finally, cases in which an unsuccessful operation has already been performed or operation has been absolutely refused. Some have reported good results from using the serum of thyroidectomized rams, the meat of thyroidless animals or the serum of myxedema patients, but more have reported failures. Klewitz thought he saw good effects from the serum of thyroidectomized rams when combined with other measures, but he thinks

that deep röntgen therapy may possibly establish a claim to be causal treatment. There is a difference of opinion as to how röntgen irradiation "works." Some think that it checks the functioning of the cells of the thyroid and thus prevents an overproduction of the glandular secretion. This view seems to be borne out by the slight biologic effect of irradiation on goiters with cystic or colloidal degeneration as compared with the marked effect on parenchymatous goiters. Some surgeons raise objections to röntgen irradiation on the ground that the results are uncertain and that irradiation produces adhesions, which make later surgical intervention more difficult. While regarding röntgen irradiation as the most important therapeutic measure, Klewitz attaches great value to auxiliary methods based on well known principles. In taking over a new case he may apply irradiation the first two days, and, at the same time, employ mild hydriatic procedures; for example, carbon dioxid baths. Galvanization of the sympathicus is performed daily. Bromid is given to nervous patients, and arsenic, often combined with iron, to weak and anemic patients. Cold compresses over the heart region for from one to two hours daily; also cold compresses on a hypervascular goiter may be of value. Serum of thyroidectomized rams may help in some cases. Such a course of treatment covers a period of five weeks. A second irradiation may be given just before the patients are dismissed, should this prove necessary. If further irradiations should be required, patients may be given ambulant treatment. [J. A. M. A.]

Loeb, L. COMPENSATORY HYPERTROPHY OF THYROID. V. EFFECT OF ADMINISTRATION OF THYROID, THYMUS GLAND AND TETHELIN AND MEAT DIET ON HYPERTROPHY OF THYROID IN GUINEA PIGS. [Jl. Med. Research, July-September, 1920. J. A. M. A.]

In contradistinction to iodine, which does not inhibit compensatory hypertrophy of the thyroid gland in the guinea pig, Loeb says feeding with thyroid tablets has a very marked inhibiting effect. This effect is a direct and specific one and it is not indirect effect, called forth by the loss of weight which is induced through thyroid feeding. Iodine preparations given simultaneously with thyroid tablets do not counteract the effect of thyroid. Feeding with thymus does not prevent thyroid hypertrophy. It is, however, possible that it diminishes the intensity and frequency of thyroid hypertrophy, although at present this cannot be stated definitely considering the variable factors which enter into the development of thyroid hypertrophy. Repeated injections of tethelin do not noticeably influence the degree of thyroid hypertrophy which follows extirpation of the greater part of the thyroid. A diet consisting principally, but not exclusively, of meat, given to guinea pigs for three and one half weeks, does not produce hypertrophic changes in the thyroid; such a meat diet neither prevents nor noticeably increases compensatory hypertrophy of the thyroid in the guinea pig.

Alamartine, H. SURGICAL ANATOMY OF NERVES OF THE THYROID. [Rev. de Chirurgie, 1920, 39, No. 5.]

Alamartine's research on man, horses and dogs demonstrated that the great nerve center for the thyroid is the superior cervical ganglion, and there are innumerable anastomoses between the vagus and sympathetic systems, especially in the laryngosympathetic plexus and the sympathetic-recurrent plexus. The nerves form two pedicles above and below and do not parallel the vessel pedicles, but they join the vessels close to the thyroid, and it is here that they should be severed, to reduce the functioning of the gland. Ligation of the vessels should include the severing of the nerve pedicles, especially of the superior pedicle. The results of this angioneurectomy of the superior pedicle in exophthalmic goiter have been exceptionally fine and constant. According to our present knowledge, the sympathetic fibers are vasoconstrictors, the laryngeal fibers vasodilators predominating in the superior pedicle. Sympathectomy therefore does not seem logical when aiming to reduce overactivity of the thyroid, but with exophthalmic goiter it proves effectual by suppressing reflex action from centripetal fibers rather than by any direct action on the gland. [J. A. M. A.]

Webb, G. B. SUPRARENALS AND EXPERIMENTAL TUBERCULOSIS. [Am. Rev. Tuberculosis, October, 1920.]

Webb here reports upon the relationships, if any, of the interactionism of tuberculosis and adrenal function. Removal of one suprarenal gland apparently did not make any difference in resistance to tuberculosis, though the primary palpable enlargement of inguinal nodes appeared a trifle sooner on the average in the operated pigs than in the controls. There was the usual compensatory hyperplasia of the remaining suprarenal gland. This suggests a demand for increased suprarenal function in tuberculosis.

Soubirou, E. A CASE OF INFANTILE MYXEDEMA. [Gaz. Hebd. Sci. Méd. de Bordeaux, 1920, September 26, p. 462.]

In 1914 an infant of eighteen months, previously regarded as a rachitic adenoid subject, was found to be myxedematous. Mother goitrous, maternal grandmother goitrous, with five goitrous children. At eighteen months the patient weighed 7 kilograms (as at birth). Head large, anterior fontanelle persistent, hair scanty, skin eczematous, tongue enormous, irregular Hutchinson teeth, short thick neck, subclavicular fat, one testis undescended, body small in proportion to head, expression of hebetude, short thick limbs, patient cannot walk, has umbilical hernia, and diarrheea often. He was treated by extract of sheep's thyroid, 1 grm. daily for five days, then five days without it, etc. During the first five days there was vomiting, diarrheea, and refusal of food. Soon, how-

ever, a veritable resurrection occurred, the eczema went, the hernia was spontaneously reduced, the tongue now lay inside the mouth, and the infant gradually gained weight. After a year, treatment had to be stopped; a relapse soon occurred. Thyroid treatment was resumed in 1917, with resulting improvement as in 1914. [Leonard J. Kidd, London, England.]

Schiassi, B. OUTCOME WITH EXOPHTHALMIC GOITER. [Policlinico, August-September, 1920. J. A. M. A.]

Schiassi reviews the ultimate outcome in 3 cases treated by sympathectomy at the Bologna Policlinic, with recovery of only 1; in 6 treated by ligation of the thyroid arteries with recovery of only 50 per cent. and of 28 treated by thyroidectomy with complete and permanent recovery in 100 per cent. He adds that from 35 to 40 per cent. have died of those treated by medical measures alone during the last fifteen years. In a few of these, röntgen ray treatment was tried after failure of other nonoperative measures, but few showed any benefit and one patient complained of aggravation. Various forms of organotherapy proved disappointing also. He styles the exophthalmic goiter patient a *tetanio psichico-morale*, and insists on long preparation for thyroidectomy, keeping the patient isolated and in bed for eight or ten weeks at least. In several cases he has witnessed the tipping over of a chair or the breaking of a tumbler bring back the tachycardia. Just before the operation he has the patient drink freely or gives fluid by proctoclysis. General anesthesia is preferable; afterward, strict isolation is as imperative as before, and the family are warned that emotional stress must be warded off at all times. Repose of heart, body and mind is the main thing, and country life should be recommended.

Judd, E. S. ADENOMA OF THYROID. [Ann. of Surgery, August, 1920.]

This author maintains that thyroidectomy will cure more than 65 per cent. of patients with the more severe types of thyroidism. He believes that if the patients could be treated earlier and with a better understanding of the plan of treatment this percentage would be increased. Adenomata are particularly curable. The paper is of interest as an example of the extreme surgical school. Dubois of Bern, clinician of acknowledged intelligence and probity, claimed 90 per cent. cures by rest in bed and a careful explanation of the causes of fear that were universally present. The adenoma from this viewpoint should be considered a compensatory hypertrophy, the thyroid taking over the function of other organ or organs put out of action from other causes. Cutting out the thyroid simply deprives the body of an important emergency organ. What the later results of the thyroidectomies may be, mentally considered, has never been estimated.

Sergent, E. EXOPHTHALMIC GOITER MISTAKEN FOR TUBERCULOSIS.
[Paris Médical, July 24, 1920.]

When symptoms of exophthalmic goiter develop in the course of tuberculosis, Sergent would attempt to relate them causally and emphasizes the need for caution in not unnecessarily exposing patients who only have psychoendocrine symptoms, continuous fever of vegetative origin (see Cawadi) as to tuberculosis to their disadvantage. He warns that many common symptoms are present. The unstable temperature and pulse, variable blood pressure, menstrual irregularities, burning cheeks, bright eye, sweats, early fatigue, emaciation, diarrhea, asthenia, and pain in the intestines. The most misleading hyperthyroid symptoms are the small, dry spasmodic cough and the tendency to shortness of breath on slight exertion. The breathing is spasmodic, apt to be staccato. Differentiation is possible only by recognizing the clinical picture of dysthyroid on the one hand and excluding active tuberculous lesions on the other. At puberty and the menopause dysthyroidism is especially prominent. The author failing to correlate the psychogenic factors at this time leads him to a one-sided endocrinopathic interpretation.

Hoppe, H. H. TREATMENT OF HYPERTHYROIDISM WITH CORPUS LUTEUM:
SECOND REPORT. [Ohio St. Med. J., October 1, 1920.]

The theory on which the corpus luteum treatment of hyperthyroidism is based, is that hyperthyroidism is caused by a defective secretion of the interstitial sex glands; that the hormones of the interstitial sex glands have an inhibitory and regulatory action on the secretion of the thyroid; that when the function of these interstitial glands is deficient, there is a lack of physiologic inhibition of the thyroid, with an excessive secretion and therefore, hyperthyroidism. In other words, hyperthyroidism and hypo-ovarianism are synonymous conditions. Hoppe emphasizes that these patients also require careful dietetic, hygienic and symptomatic treatment. He has had very good results from this treatment. [J. A. M. A.]

Janney, N. W., and Henderson, H. E. DIAGNOSIS AND TREATMENT OF
HYPOTHYROIDISM. [Arch. Int. Med., September 15, 1920. J. A.
M. A.]

Janney and Henderson are of the opinion that latent hypothyroidism is more frequent than generally supposed, as among eighteen consecutive thyroid cases, it was present in twelve, four being cases of dysthyroidism and only one case presenting classical myxedematous symptoms. Analysis of clinical data shows the following to be present in more than 50 per cent. of the cases: history of obesity, particularly in early life, mental symptoms, marked liability to contract infections, hair anomalies, dry, harsh skin with pigmentation and atrophy, cold extremities and cold skin generally, obesity, decreased size of thyroid, subnormal tempera-

ture, pulse and respiration occur most frequently, being found in 81 per cent. of the authors' cases. Attention is called to the diagnostic value of lymphocytosis and mononucleosis in obscure thyroid cases. The basal metabolic rate is of great value in diagnosis and treatment of hypothyroidism, but cannot be considered an absolute criterion. The blood glucose tolerance test is abnormal in respect to the height of the curve and delayed return to normal level in the majority of cases of thyroid disease, but is only diagnostic of endocrine disease in general. There is no constant relation demonstrable in general. There is no constant relation demonstrable between the blood sugar curve and the metabolic rate in thyroid disease. The blood glucose curve is, however, of confirmatory value in the diagnosis of obscure thyroid cases. Estimation of the nitrogen balance in two cases of obscure hypothyroidism showed an inability to retain nitrogen, this being further evidence of the synthetical function of the thyroid gland, as further developed in the theoretical consideration. Treatment of hypothyroidism the authors claim is best carried out with Kendall's thyroxin and controlled by estimation of the basal metabolic rate.

Goetsch, E. DIAGNOSES AND TREATMENT OF THYROID DISEASE BASED ON USE OF EPINEPHRIN HYPERSENSITIVENESS TESTS. [N. Y. State Jl. of Med., September, 1920.]

The importance of recognizing hyperthyroidism as the chief factor in a large group of obscure cases symptomatically simulating one another, tuberculosis being one of the most important, is here emphasized. The diagnostic value of the epinephrin test in recognizing hyperthyroidism, in which case there is a constitutional hypersensitiveness to this drug, is also important. He claims that as far as the pathology of the gland is concerned in these clinical cases, which were regarded as tuberculosis by many physicians who saw them previous to their appearance at Saranac Lake, Goetsch draws attention particularly to that condition to which he has given the name of "diffuse adenomatosis" because it is in this condition that the diagnosis is difficult to make. However, he claims that the most expert clinical diagnostician is often at a loss in recognizing cases of mild hyperthyroidism, due to diffuse adenomatosis of the thyroid gland. In this latter condition there are neither the well known eye signs and vascular features of exophthalmic goiter, nor are there the discrete nodules of adenoma. The gland is usually mildly to moderately enlarged, fairly uniformly; it has an elastic, firm feel and at operation is seen to be more or less adherent to the surrounding structures. The capsule is thickened, there is some increased circulation particularly, it seems, of venous nature, and the characteristic features are more particularly seen in the microscope. There is an increase of the interstitial so-called "fetal cells." There are numerous nests of very small newly formed acini. The remaining

larger acini vary greatly in size. The alveolar walls are often wavy; the cells are cuboidal to low columnar and oftentimes aggregations of lymphoid cells are characteristically seen. Goetsch is almost of the opinion that this is a new clinical entity which heretofore has very often escaped notice, and in which hyperthyroidism is produced principally by an increase in amount of the so-called fetal tissue in the thyroid, with also some increased activity of the thyroid alveolar cells. This, in a number of cases, was recognized by the increased concentration of mitochondria in the cells. When a positive epinephrin response is elicited after a reasonable trial at rest cure, and in the absence of any other recognizable pathology, the physician should think of a possible hyperthyroidism and then of the benefit which in many of these cases follows resection of the gland. The results thus far obtained are sufficiently encouraging to warrant further trial of this kind.

Schiassi, B. EXOPHTHALMIC GOITER. [Policlinico, June 21, 1920.]

Schiassi presents charts showing the vicious circle set up by abnormal conditions in the cerebellum, sympathetic nervous system and the thyroid, which finally involves other ductless organs. But he explains that in true exophthalmic goiter the thyroid is primarily affected; the disturbance in the secretion leads to toxemia which may prove fatal unless the vicious circle is broken up in time. When the thyroid is only secondarily involved, the disturbance is never so severe. With this latter form there may be periods of health alternating with periods of symptoms over many years, but they never prove fatal. This is the type of cases that are called *formes frustes* of exophthalmic goiter, but this is a misnomer; it is not an abortive form but merely presents a few of the symptoms. An instructive instance cited to show the interrelations between the endocrine glands is that of a physician who injured the thyroid by running into a clothesline in the dark. The swelling and pain in the thyroid and palpitations were accompanied by swelling and pain in the testicles, and priapism. Sexual excitement was accompanied by pain in both testicles and the thyroid. [J. A. M. A.]

Krogh, M. THYROID METABOLISM. [Ugeskrift for Laeger, April 22 and 29, 1920.]

The thyroid metabolism of bed patients has been investigated by this observer. He measured the amount of the expired air and the percentage of oxygen and carbon dioxid in this air. The patients were classified according as they suffered from (1) Graves's disease, (2) goiter unaccompanied by other signs of Graves's disease, (3) myxedema, and (4) adiposity without myxedema. In the first class metabolism was increased by 40 to 80 per cent. above normal. In the second class this increase of metabolism was only from 5 to 25 per cent. above normal. In several cases the clinical evidence was in favor of Graves's

disease, but this diagnosis was not made because the metabolism was perfectly normal, and there was, therefore, evidently no pathological increase of iodothylin. In one case there was considerable enlargement of the thyroid, with exophthalmos, a rapid irregular pulse, lassitude, and several nervous symptoms. But as the metabolism was perfectly normal the diagnosis of Graves's disease was rejected. The authoress concludes that the estimation of the absorption is a useful diagnostic test, of special value in the differential diagnosis of indefinite forms of Graves's disease and myxedema. This index of metabolism is also useful as showing the effect of treatment on both these diseases.

Jensen, C. O. STANDARDIZATION OF THYROID PREPARATIONS. [Hospitalstidende, August 18, 1920. J. A. M. A.]

Jensen refers to the axolotl, the larva of *Ambystoma mexicanum*, which is being used more and more in laboratory research. It does not undergo the metamorphosis usual in such amphibians, but persists and breeds in the larval stage, without the transformation process which changes it like the tadpole from a water to a land animal. He has found that treating the axolotl with thyroid preparations is promptly followed by natural metamorphosis. This occurs so invariably that he suggests that this may be utilized for standardizing thyroid preparations. He explains the phenomenon as due to an inherited substandard condition of the animal's own thyroid gland reducing its functional capacity below the level required for the physiologic metamorphosis. The effect of the thyroid preparations did not parallel their iodid content.

Escudero. THYROID DYSPEPSIA. [Rev. Esp. de med. y cir., July, 1920.]

Functional disturbances of the thyroid may give rise to gastrointestinal symptoms. Clinically two forms of this thyroid dyspepsia may be distinguished—one corresponding to thyroid insufficiency and another due to hyperthyroidism. The first is characterized by a tendency to low gastric values, and includes the majority of hypochylia or achylia syndromes. The second form shows a tendency to high gastric values, but sensory disturbances appear first and persist. Disturbances of secretion may be absent; when present they may vary from heterochylia to permanent gastric hypersecretion. Chronic gastritis is the necessary termination of these cases.

Gordon and Bazin. CHRONIC DIARRHEA ASSOCIATED WITH ADENOMA OF THYROID GLAND. [Canadian Med. Assoc. J., April, 1920. B. M. J.]

A woman, aged 33, who had complained during the past ten years of alternating diarrhea and constipation, with vomiting and headache; she had lost 15 pounds in weight and felt "nervous." Physical examination was negative except for a small adenoma of the right lobe of the thyroid; this was regarded as a possible cause of symptoms of mild

hyperthyroidism with intestinal manifestations. An adrenalin test gave a positive result on two occasions. The adenoma was removed, and six weeks later the patient had gained 25 pounds, had had no return of the diarrhea or constipation, was sleeping well, and was less nervous; microscopically the adenoma showed abundant mitochondria. The case illustrates the claim of Goetsch that between adenoma of the thyroid and certain types of hyperthyroidism there exists a relation, depending not on the size of the adenoma but upon its activity, which may be measured by the response to the adrenalin test and by the presence of mitochondria in the tumor cells.

McCarrison, R. EFFECT OF FOOD DEFICIENCY AND EXCESSIVE THYROID GLAND. [Ind. Jl. of Med. Research, January, 1920. J. A. M. A.]

McCarrison's studies have shown that dietaries deficient in vitamins lead to a reduction in size and weight of the thyroid gland and render it susceptible to the noxious action of intestinal bacteria, or of their products, with resultant atrophic and necrotic changes. A scorbutic diet of crushed oats and autoclaved milk may cause in guinea pigs considerable enlargement of the thyroid, in the main, the result of congestion and hemorrhagic infiltration of its tissues. Dietaries containing adequate provision of vitamins, but excessively rich in proteins and fats, induce in the thyroid of pigeons in confinement marked degrees of hyperplasia, the extent of the hyperplasia being largely dependent on the duration of the organs' exposure to the goitrogenous influences induced by the excessive protein and fat content of the food. The addition of onions to a dietary excessively rich in protein and fats, while containing at the same time an abundance of vitamins, markedly retards the development of thyroid hyperplasia, and the tendency to acinar budding in pigeons living in confinement. The beneficial influence of the onions is held to be due in part at least to their action in restraining the growth of putrefactive types of bacteria in the gastro-intestinal tract and in retarding the absorption of their products. It is suggested that succus alii might prove of benefit in restraining the thyroid hyperplasia of exophthalmic goiter. The changes in the parathyroids induced by a diet deficient in vitamins and excessively rich in starch and fat appear to be related in their origin to intestinal anaerobes, the noxious action of which is greatly favored by the defective diet.

Fasano, M. RARE SYMPTOMS IN THYROIDITIS. [Il policlinico, April 26, 1920.]

The case of a married woman of thirty years of age is here reported. During an attack of suppurative thyroiditis tachycardia developed, tremors of the upper limbs, slight exophthalmos, and Moebius's sign, but neither Stellwag's or von Graefe's sign. Rapid disappearance of the symptoms followed evacuation of the abscess.

Lahey, F. H. LOSS OF BOTH EYES IN GRAVES'S DISEASE. [Boston Med. and Surg. J., April 22, 1920.]

A woman with such severe exophthalmos as to necessitate enucleation of the right eye in consequence of edema and ulceration of the cornea is here reported upon. A month later the superior cervical sympathetic ganglion was removed on the left side; at the same time the external canthus was incised. The exophthalmos, ulceration and edema continued to increase, and two days later the lids were sutured together. Two months later this eye had to be removed.

Rachford, B. K. SUBSTERNAL GOITER WITH PRESSURE SYMPTOMS. [Ann. JI. Med. Sci., September, 1920.]

Rachford's patient was treated successfully, so far as relief of pressure symptoms is concerned, by rest, röntgen ray, fifteen drops of tincture of digitalis, three times a day, and a capsule containing 2½ grams of the neutral bromid of quinin, 1 grain extract of ergot and 1/30 grain extract of belladonna, three times a day, for a long period of time. At rare intervals this treatment has been interrupted for a period of a few weeks.

Ishihara, M. EXPERIMENTAL EXTIRPATION OF THYROID. [Bull. Naval Med. Ass. of Japan, June, 1920.]

Enlargement of the thymus gland followed excision of the thyroid in rabbits, due to a compensatory action existing between these organs. Degenerated corpuscles of Hassall were seen more frequently in the thymus gland of normal rabbits than in operated ones. Enlargement of the pituitary body was not observed.

Squier, T. L. IMPROVEMENT IN EXOPHTHALMIC GOITER SUBSEQUENT TO SEVERE FOCAL INFECTION. [Am. JI. Med. Sci., September, 1920.]

Two instances of hyperthyroidism complicated by infections caused an increase in the thyroid symptoms. After the acute infection had subsided the situation was in part or entirely relieved. The improvement is attributed to actual loss of secretory tissue following the infection.

Trott, R. M. BLOOD PICTURE BEFORE AND AFTER GOETSCH EPINEPHRIN TEST. [Arch. Int. Med., September 15, 1920.]

If 4-8 minims of adrenalin be given subcutaneously to individuals with apparent or even externally unrecognizable hyperthyroidism, there will result, according to this observer, a rise in leucocyte count with definite lymphocytosis, which latter may be absent in ataxic goitrous state.

Vincent, S., and Arnason, J. S. RELATIONSHIP BETWEEN THYROID AND PARATHYROIDS. [Endocrinology, April-June, 1920.]

These experiments show the nonsense of certain reports that parathyroid tissue is converted into thyroid tissue after thyroidectomy.

Herzfeld, E., and Klinger, R. CHEMISTRY OF THYROID SECRETION. [Schw. Med. Woch., July 1, 1920.]

These authors conclude from tadpole experiments that the iodine is not a necessary part of the thyroid biological reaction. [For tadpoles.]

I. SENSORI-MOTOR NEUROLOGY.

1. PERIPHERAL NERVES.

Knapp, Albert. PROXIMAL CEREBRAL BRACHIAL PARALYSIS. [Monatsschrift für Psychiatrie und Neurologie, January, 1920.]

Paralysis of the fingers is usually most prominent in hemiplegia, as opposed to the musculature of the upper arm and shoulder. There is a proximal type of cortical brachial paralysis in which contrary to the observations on usual hemiplegias the motion of the shoulder joint is more impaired than in finger joints. The individual muscle groups and sections of the arm as well as of the leg are projected on to the cortex of the front central convolution. Proximal brachial paralysis therefore should seek its focus upon or in or close beneath the brain cortex. Usually a tumor is causing it, more rarely an encephalomalacia or traumata. Almost invariably the proximal brachial paralysis is associated with paralysis of the entire leg or its proximal joints. This latter selection usually follows the predilection type.

Sett, Erwin. CONCERNING THE ETIOLOGY AND SYMPTOMATOLOGY OF POLYNEURITIS. [Archiv. f. Psychiat. u. Nerven., 1920, Vol. 61, p. 564.]

The author describes fourteen cases of unmistakable polyneuritis selected by him from the clinical material in the Königsberg clinic from 1914 to 1919. The first four cases were of postdiphtheritic neuritis. In one of these there was, beside vagus neuritis, myocarditic changes resulting in death. (Death was the result also in another case in which there was vagus involvement.) Specially noteworthy in these cases was the affection of certain motor brain nerves—in three cases of the eye musculature, in two of the facialis and trigeminus, in one of the hypoglossus with abducens paralysis. While the accommodation paralysis is typical of postdiphtheritic neuritis, the involvement of the other brain nerves is extremely rare. Case 5 was a severe amyotrophic polyneuritis of

unknown origin. Cases 6 and 7 were assumed to be postinfectious polyneuritis after grippe, though mention of this disturbance after grippe in the literature on the various epidemic is infrequently met with. In case 8, of doubtful etiology, the edema which dominated the disease picture was interesting. Whether the edema was conditioned by mitral insufficiency, or whether with a preexisting injury of the heart, an infectious agent resulting in a "hydropic neuritis form" was partly responsible, for the insufficiency could not be certainly determined. Repeated exposure to wet could be assumed as the etiological moment in case 9, of amyotrophic character. During the war the question as to whether polyneuritis is caused from exposure to cold became of actual importance and various writers have come to recognize this factor in the etiology of polyneuritis. Case 10 was due to enteritis, a causal moment rarely met with in peace times. The case was remarkable from the pronounced phenomena with absence of atrophy or anomalous electrical reactions. There were also no indications of a cerebral localization of the disturbances, and the cerebrospinal fluid showed no pathological changes. The author was unable to find in the literature any similar case of polyneuritis following enteritis. Case 11 was one of neurotabes peripherica, a diagnosis confirmed by the peculiarities of the disease picture, by the course and the favorable termination. The only cause to which it seemed possible to ascribe the disturbance was a whitlow for which incisions had been made in the thumb. A so-called neuritis ascendens, such as sometimes develops from inflammatory lesions, could not be assumed, as the phenomena first appeared on distantly located parts of the body (eyes and both arms and the legs). Arrival of infectious substances in the circulation is here to be considered responsible for the polyneuritis. Cases 12 and 13 are also interesting from an etiological point of view, as one of them followed malaria and the other typhus. Writers have called special attention to the rarity of neuritis after malaria, Wertheim-Salomonson stating that in abundant experience with malaria he had never encountered a case. Typhus is perhaps even a rarer cause of neuritis. Case 14 was a severe amyotrophic polyneuritis after arsenic poisoning (attempt at suicide). The author assents to the views published by Oppenheim toward the end of 1918 that the intoxication, infection, exposure, etc., results in neuritis in persons of "neuropathic diathesis"—views confirmed by the history and characteristics of the author's patients. Through the recent work of Walter the question of the localization of polyneuritis has come to occupy the foreground of interest. Walter comes to the conclusion that the generalized forms of polyneuritis represent a disease, the point of origin of which is not the peripheral nerves in their extradural sections, but in their extradural roots and sustains his theory by the positive spinal fluid findings, the increase of total albumin, and the lymphocytosis. In 5 of the author's cases the liquor cerebrospinalis was examined with the following results:

- Case 5, Nonne weak +, lymphocytosis +
 Case 6, Nonne weak +, lymphocytosis —
 Case 7, Nonne weak +, lymphocytosis —
 Case 9, Nonne weak —, lymphocytosis —
 Case 10, Nonne weak —, lymphocytosis —

The Wassermann was negative in all these cases. In the author's opinion the localization of polyneuritis still remains an open question. Concerning the prognosis and therapy, recent literature has brought little that is new, though Oppenheim emphasizes the importance of treatment by sweating, and Schuster mentions a cure of an obstinate case after typhus by inoculation.

Boorstein, J. OBSTETRIC PALSY. [Med. Record, November, 1919.]

Seventeen cases of this condition are described by the author. Great care should be taken to prevent over-stretching and over-use of the denervated muscles or contractures of their antagonists; the shoulder should at once be put in a splint or brace to prevent stretching of the deltoid. In most cases the injuries to the nerves are not severe, and if treated early will recover. Conservative treatment should be tried for three months; it consists of support, massage, and exercises. If this fails, Taylor's operation on the plexus is useful, and the contracted pectoralis major, subscapularis, and teres major should be cut by Sever's method.

Tranter, C. L. FORMICATION TEST IN PERIPHERAL NERVE INJURIES. [Cal. State Jl. of Med., July, 1920.]

The value of Tinel's sign and of residual formication are still subjects for serious research. The author here maintains that the Tinel formication test gives positive evidence of regeneration long before the reflex arc repair is in evidence. It frequently tells when a suture has been unsuccessful and often indicates the position of a neuroma under a long scar and helps in locating the nerve ends at operation and in telling whether a suspicious palpable mass is a neuroma or not, or in revealing a secondary lesion. It is of value in raising the morale of the patient during the long period before the reappearance of voluntary motion, since the sign of feeling is psychological evidence of presentation of function.

Lewandowski, M. FORMATION OF CONTRACTION IN PARALYZED MUSCLES AFTER NERVE INJURY. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1917, Vol. 36, p. 320.]

The man observed by the author had suffered a gunshot fracture in the upper arm. From July to November of the same year the arm lay in a splint without plaster cast. When the splint was removed and when

the fracture had healed, the man reported that there was a complete radialis paralysis with wrist drop and corresponding position of fingers. A radialis splint was then applied. The position of the hand improved to such an extent that on the following February the splint could be dispensed with and the hand could be used without it. In fact at the time the writer describes the case the hand no longer fell loosely, the proximal phalanges were held at about the same level as the back of the hand, though passive movements of the fingers were limited in accordance with this contraction. Movements in the remaining directions were free. The joints were not painful and there was no contraction of the thumb, all active movements necessitating radialis innervation were impossible. In efforts to close the fist the middle and terminal phalanges lay against the proximal phalanges of the fingers which retained their extended position; the hand was raised slightly but not actively; sensibility to electric stimulation was entirely destroyed. Ulnaris and medianus unharmed. Pulse on both sides alike, no other disturbances. Thus in place of the flaccid paralysis of the extensor muscles of the hand and fingers in radialis injury, a fixed contraction or retraction had ensued, which performed the same service for the man as the splint. This is the fourth case of formation of contraction in spite of total and probably incurable radialis paralysis which has fallen under the author's observation. A result is arrived at spontaneously which it was the object of surgical intervention to attain. The cause of the contraction is probably the prolonged tense position in which the muscle is held by the splint. Why this result does not follow in all cases is difficult to understand, but the cases where it occurs suggest the possibility of devising some means by which a contraction permitting the use of the hand might be arrived at in most, if not all, cases of radialis paralysis. The same treatment is recommended for other nerve regions.

Barre, Andre. CONTRIBUTION TO THE STUDY OF THE SERRATUS MAGNUS MUSCLE. [*L'Encephale*, 1920, August 10, Vol. 15, p. 489.]

The physiological and pathological phenomena connected with the serratus magnus are now well known, thanks to the works of Duchenne. The author, however, gives three cases, in two of which there was section or contusion of the nerve so that they had all the value of laboratory experiments. Observation three was a paralysis caused by a pulmonary infection of the subjacent parts, presenting an almost pure paralysis of the serratus magnus and the author emphasizes certain disturbances connected therewith, in both active and passive movements. Besides the sagging of the shoulder and inability to raise the arm above the horizontal position, there was at once noticeable an abnormal slackness of the scapula in adduction of the shoulder forward because the bone, no longer held along the thoracic wall, followed the movements of the shoulder, separating from the line along the spine. Normally this sepa-

ration takes place also, but to a much less degree. As result the scapula had abnormal prominence when the arm redescended along the body. In this movement of descent the scapula pivots on its external angle in such a way that the inferior angle floats free, giving rise to the phenomenon of scapulum alatum. The result was the same in abduction with movement forward, either passively or when the patient himself executed the movement. These being the conditions the author thinks he is justified in calling attention in connection with the classical signs of paralysis of the serratus magnus already described to the phenomena observed in this instance, which indicate that only those cases show this paralysis isolatedly and in all its purity where the functions of the muscular bundle of the inferior portion are affected.

Sicard, J. A. POSTHERPETIC NEURALGIA AND ITS SURGICAL TREATMENT. [La Médecine, February, 1920.]

Herpes zoster, according to Sicard, involves lesions in at least four segments of sensibility to pain—namely, the spinal roots, the cells of the posterior horn, the sympathetic ganglia, and the intra-spinal and para-spinal sympathetic. If the cells of the posterior horn or the branches of the sympathetic are chiefly involved, operation on the spinal ganglion or the root will be useless. He states that four operations may be considered. The extraspinal or Franke's operation, tearing off the spinal ganglion by rolling the nerve round a pair of forceps. Guleke's operation, Sicard and Desmarest's operation, and section of the posterior root. Guleke's operation consists in dividing the posterior root independently of the anterior root in the epidural space outside the dura mater. It is a delicate operation, and when performed at the level of the brachial or lumbo-sacral plexuses is almost inevitably followed by motor paralysis. It should therefore only be performed in the intercostal region. Sicard and Desmarest's operation, which is only applicable to the intercostal segments, consists in section of the spinal ganglion and of the adjacent anterior and posterior roots. The gangliectomy must be carried out on at least four adjacent radicular segments.

van Straaten, J. J. A CASE OF PORPHYRINURIA. [Nederlandsch Tijdschr. voor Geneeskunde, 1920, LXIV, H 2, 2539.]

About half the cases of porphyria show either central or peripheral palsies. There may be also attacks of severe pain in abdomen or limbs. The case recorded here was a West Indian negro, 45, who had lues six years previously. His illness began with symptoms of ileus. He said that six months previously he had had sudden violent abdominal pains, lasting for ten days, without any action of the bowels; he also vomited frequently. About a fortnight after his admission he had a peculiar stiff feeling in the muscles of his limbs and trunk, worst in the arms. Very soon both upper arms were completely paralyzed; he had

also weakness of neck muscles, great atrophy of shoulder muscles, the trapezius, however, acting well, muscular atrophy of both upper arms; the atrophic muscles showed fibrillary contractions. Some atrophy in lower limbs. The nerve trunks are painful on pressure; positive Lasègue sign. Minus knee jerks. Partial reaction of degeneration in muscles of shoulder, upper arm and lower limbs; slow vermicular contraction to galvanism. Negative Wassermann in blood and spinal fluid; no peocytosis; negative Nonne phase I. A few days later the porphyrinuria appeared; porphyrine was also found in the evacuations. The patient is gradually recovering, but his nerves in the upper arms are still painful on pressure, and he has a stiff feeling in the upper abdomen; the porphyrine has disappeared. [Leonard J. Kidd, London, England.]

Roussy, G., and Cornil, Lucien. NONFAMILIAL PROGRESSIVE HYPERTROPHIC NEURITIS IN ADULTS. [Annales de Médecine, 4, 296, 1919.]

A case differing from the two known types of this disease, the Dejerine-Sottas, and the Marie Boveri types, is reported. The first type, characterized by general muscular atrophy, fibrillary twitchings, hypertrophy of nerve trunks, shooting pains, ataxia, Romberg's sign, nystagmus, myosis and Argyll Robertson pupils, has a hypertrophic interstitial neuritis as its pathologic basis. The second type shows muscular atrophy, more marked in the lower extremities, kyphoscoliosis, exophthalmos, intention tremor and jerky speech recalling that of multiple sclerosis. It has as its pathologic basis involvement of nerve fibers and interstitial tissues. The onset in this case occurred at forty years of age. There was Aran-Duchenne type of atrophy in the upper extremities with fibrillary twitchings and reactions of regeneration, ataxia in all extremities. Plantar and Achilles reflexes were absent, right knee jerk diminished, left absent, pupils normal. The pathological survey showed degeneration of the myelin sheaths with onion shaped enlargement at intervals, increase in number of nuclei in sheaths of Schwann, alteration of axis cylinders, numerous young regenerating axis cylinders, and mild hyperplasia of interstitial tissue.

Horder, T. NERVE SYMPTOMS IN ACUTE INFECTIONS. [Lancet, July 24, 1920. J. A. M. A.]

The mechanisms, physiologic and histologic, by which nerve symptoms in acute infections are produced are discussed by Horder. Nerve symptoms arising as part of the interaction already referred to are directly referable to one or more of three different processes by which the nervous system becomes implicated: (1) by toxemia; (2) by infection of the meninges; (3) by infection of the nerve tissues themselves. In the first of these three mechanisms the nerve symptoms manifested by the patient are chiefly "functional" in origin; in the second and in

the third of these mechanisms the symptoms are chiefly "organic" in origin. The great significance of these mechanisms lies in this distinction. The mechanism of toxemia is the one operative in diphtheria and tetanus in the great majority of cases. It is also that by which nerve symptoms arise in most cases of pneumonia, typhoid fever, scarlet fever, and rheumatic fever. Secondary infection of the meninges occurs not infrequently in pneumococcus infection and is relatively more common when the primary infection occurs in the middle ear. In measles the nerve symptoms are usually toxemic, but the specific virus, though it causes meningism not infrequently, rarely causes a true meningitis. That it occasionally sets up an encephalitis or a myelitis, however, has been long recognized. In mumps an actual inflammation of the central nerve structures sometimes occurs, and recent experimental work suggests strongly that the virus in this disease has group affinities with the causative virus of poliomyelitis. It is possible that the virus of infantile cholera has similar affinities. In generalized tuberculosis the mechanism of encephalitic as well as meningitic involvement may be added to that of a toxemia. In cerebrospinal fever the meningococcus attacks the pia arachnoid in primary fashion, and this is by far the chief mechanism of production of the long series of symptoms presented in the disease. In poliomyelitis and in encephalitis, be the virus identical or only possessed of group affinity, the primary infection is in the central nervous system itself, through intimate vascular infiltration. The nerve symptoms present in influenza, though protean in nature, are probably due, in the main, to a toxemia, which may be of any degree from mild to intense; meningism is not uncommon; meningitis is rarely present.

Bouwmeester, L. POSTDIPHThERIAL POLYNEURITIS. [*Nederlandsch Tijdschr. voor Geneeskunde*, 1921, LXXV, H 1, 174.]

The various postdiphtherial palsies have been held by Hotzen to be of myogenic origin; by Barabás to be due to a spinal cord affection, on account of the presence of dissociated sensory changes, viz., hypo- or analgesia with preservation of the other sensory qualities; by Strümpell to be of polyneuritic nature due to an elective action of the diphtheria toxin on particular groups of nerve fibers, for he found complete preservation of touch-, temperature-, and pain-sensibility, together with the presence of ataxia, astereognosis, and deep sensibility disturbance. The writer here records a case of postdiphtherial polyneuritis which resembles in many respects one of P. Friedländer (1914). A youth of nineteen had severe diphtheria with early nasal regurgitation of food, and palatal palsy; he was immediately treated by intravenous horse serum, and also intramuscular. He was given strychnine hypodermically in increasing doses for the greater part of two months. A month after admission he vomited, was somewhat cyanosed, and had a reduplicated pulmonary second sound; ten days later palsy of accommodation; he

began to have a numb feeling in left little finger and ring finger, with rather sluggish knee jerks. A fortnight later he had weakness in hands, arms, and legs; his left side was the weaker; loss of knee and ankle jerks, and of plantar reflexes. On both sides the ulnar nerve was especially affected, with marked sensory and motor loss; astereognosis on ulnar sides. There were also sensory and motor changes in the feet, and slight ataxy in arms. Rombergism and ataxic gait. No tenderness of nerve trunks. A partial R. D. on ulnar side of both hands. A fortnight later the palate and accommodation recovered, and a month later patient was discharged quite well except for absence of knee jerks and presence of diphtheria bacilli in his pharyngeal mucosa. Bouwmeester concludes that postdiphtherial sensory and motor symptoms occur, partly myogenic and partly neurogenic (central or peripheral); his own case must be labelled a polyneuritis. [Leonard J. Kidd, London, England.]

Nutter, J. A. SCIATICA FROM AN ORTHOPEDIC STANDPOINT. [Can. Med. Ass. J], June, 1920.]

Sciatica must be treated on an etiological basis. Tonsils, abscessed teeth, chronic prostatitis all may be infectious foci and may need treatment. An arthritic spine may need fixation; a loose sacro-iliac joint should have efficient support; disease of the hip-joint calls for treatment. Absolute rest is essential for the immediate treatment. For the pain, acetylsalicylic acid is useful, as also the related salicylates. Counter irritation over the course of the nerve is valuable. The Paquelin cautery is very useful. The application of mustard and the use of blisters may give relief. The injection of sterile water, alcohol, or weak cocaine solution into or beside the nerve, is not often practiced, as permanent damage may be done. Nerve stretching is no longer in favor, and properly so. In subacute cases, baking and massage will generally be found useful. Hydrotherapy is sometimes of value, but like electricity more often gives only temporary relief. Anemia should be treated with iron and arsenic. A special diet is indicated only in cases of gout, diabetes and rheumatoid arthritis. The chief idea is keep the eye on the etiological factors.

Oljenick. TREATMENT OF NEURALGIAS BY FREEZING OF NERVES. [Nederlandsch Tijdschr. voor Geneeskunde, 1920, LXIV, No. 6, 1966.]

Oljenick discusses before the Netherlands Surgical Society the treatment of peripheral nerve pains by Trendelenburg's method of local freezing of the nerve trunk. By this method the nerve's conductivity is rapidly interrupted, with preservation of its continuity. The nerve trunk is exposed under aseptic conditions, and the freezing is done by a double tube freezing apparatus made of very thin red copper; there is a hooked part at one end in which the nerve trunk is laid; at this bent, hook-shaped end the two tubes are connected together. On one side

ethyl chloride is blown in, and on the other it is removed by a water pump. By this means the hooked end and the nerve trunk lying in it are frozen. A nerve of the size of the median is frozen for two minutes, then thawed with lukewarm physiological salt solution, and then frozen again. In the case of pain from bullet wounds one must freeze the nerve trunk centrally of the point of lesion. The pain disappears immediately the nerve is frozen, and there is motor palsy of the muscles supplied by it. From experiments on animals it appears that ultimate regeneration of the degenerated frozen nerve fibers always takes place, but at a varying date, usually from six to twelve months. The date of regeneration depends partly on the point at which the nerve is frozen and partly on the length of the distal segment; a short distal end regenerates more quickly than a long one. This freezing method has some definite advantages over the alcohol injection method. [Leonard J. Kidd, London, England.]

Boyd. PELLAGRA AMONG TURKISH WAR PRISONERS IN EGYPT. [Edin. Med. J., June, 1920. B. M. J.]

Pellagra occurred in considerable proportions among Turkish prisoners in Egypt. Clinical features which appeared early were pigmentation and dryness of the skin on the backs of the hands and the face first. Dyspepsia, diarrhea, muscular atrophy, hyperpiesis, achlorhydria and mental dejection were among the symptoms as well. The clinical features resembled those of a profound suprarenal inadequacy. There was no evidence of an infection plant or animal. The digestive disturbance accompanied by defective secretion of hydrochloric acid appeared to lead to disturbance of pancreatic digestive function and malassimilation of protein and fat. There seemed to be an intimate connection between the proportion of biological protein in the diet and the causation of pellagra. The relation between maize and pellagra appeared not to be due to any toxic properties inherent in the maize, but to its poverty in vitamin. Treatment by increasing the intake of the latter was speedily successful.

Bolten, G. C. THE PROBLEM OF SO-CALLED ASCENDING NEURITIS. [Nederlandsch Tijdschr. voor Geneeskunde, 1921, LXX, H 1, 181.]

The parenchymatous process of a genuine neuritis cannot ascend, but inflammation of the lymph paths of nerves, as in cases of perineuritis or of interstitial neuritis, does sometimes occur; the infective processes in the lymph paths of a nerve trunk can ascend and even pass up neighboring nerve trunks anatomically connected with it; we should describe these as cases of a "lymphangitis nervorum ascendus" and add "streptococcal" or "tuberculous," etc. Bolten describes a case of a man aged 25 who had a tuberculous lesion of a carpal bone; the inflammation extended into the soft parts and into the median nerve, and

tubercle bacilli penetrated that nerve's lymph paths. At first there were exclusively signs of a neuritis of the most peripheral part of the median nerve. Some months later he returned with signs of a median neuritis of the forearm; then some months later signs of a complete plexus neuritis. Thus the germs that penetrated the peripheral median nerve from the tuberculous os lunatum must have ascended in it and thence passed into other nerve trunks. On account of the obstinate pain the arm was amputated, and the tuberculous lesion was demonstrated. When the patient was first seen there was not the slightest trace of any affection of the forearm nor of lymphangitis or glandular swelling. Apart from the primary bone lesion and the interstitial neuritis there was nowhere any trace of inflammation, nor of swollen lymph nodes, so that here there was no question of an ascending lymphangitis with secondary signs of neuritis. In almost all the cases described as "descending neuritis" that bear criticism, there is mention of an infected skin wound or of a phlegmon or other inflammatory focus. [Leonard J. Kidd, London, England.]

Sprawson, C. A. BERIBERI IN MESOPOTAMIAN FORCE. [Quart. Jl. of Med., July, 1920. J. A. M. A.]

The results of Sprawson's observations are summarized as follows: The disease called beriberi is a syndrome which may arise from various causes under different circumstances. One class of case is not due to a food deficiency, but appears to result from an infection. Other cases are due to a vitamin deficiency in the food: this takes a few months to operate in a previously healthy subject and may be called "primary beriberi." In yet another class the syndrome arises apparently from the effect of some depressing influence or secondary infection on a subject previously rendered susceptible to the disease. These cases may be considered to have been suffering from "latent beriberi." In all classes the clinical appearance is approximately the same, there being differences only in the relative frequency of various manifestations in the three groups.

Roussy, G., and Cornil, L. DIAGNOSIS OF SCIATICA. [La Médecine, February, 1920.]

Three new and useful tests for sciatica are here described. (1) Lateral flexion of the trunk. If the patient, standing with his hands on his hips, flexes his trunk laterally, first to the right and then to the left, without bending the lower limb, a limitation in lateral flexion will be observed, as a rule on the side of the pain, more rarely on the opposite side. (2) Dorsal flexion of the foot. The patient lies on his back, the affected limb being in the position of maximum extension. The foot is suddenly flexed on the leg, thus causing an elongation of the nerve, especially of the posterior tibial. In genuine cases an immediate pain de-

fense movement occurs, shown by flexion of the leg on the thigh and of the thigh on the pelvis so as to relax the elongated nerve. The pain is localized in the calf, and sometimes all along the trunk of the nerve on the back of the thigh. (3) Internal torsion of the foot causes a pain on the outer surface of the leg, especially below the head of the fibula, and the patient flexes the lower limb to relieve the pain. Elongation of the external popliteal nerve is probably the cause.

Byfield, A. H. POLYNEURITIC SYNDROME RESEMBLING PELLAGRA ACRODYNNIA. [Am. Jl. Dis. of Children, November, 1920. J. A. M. A.]

Seventeen patients, all under 4 years of age (five of them being less than 1 year old), who have been seen by Byfield, manifested a group of signs and symptoms out of the ordinary. The resemblance of their malady to pellagra was striking, but so many points spoke against such a diagnosis, that it was necessary to think of the presence of some other disease. The disease picture was a complex one, the nervous system and the skin being most involved, while the respiratory tract and the digestive tract appeared to be less affected. According to the anamneses, infection rather than dietary error seems to play the more important rôle as an exciting factor. A postmortem examination in one case (complicated with tuberculosis) showed involvement of an occasional anterior horn cell of the spinal cord, gliosis about the central canal and edema of the sensory roots. It is suggested that the disease is a post-influenzal radiculitis or sensory polyneuritis.

Castronuovo, G. DIFFUSE TUBERCULOUS NEUROFIBROMATOSIS. [Riforma Medica, September 4, 1920.]

A 34 year old man dies of tuberculous pneumonia. He has more or less coincidentally developed a diffuse neurofibromatosis. The onset had been accompanied with diarrhea, asthenia, diminished blood pressure and gastric disturbance, and pigmentation of the skin. Adrenalin injections had caused marked improvement in these symptoms but the lung process was unmodified.

Salom, C. E. BERIBERI. [Gaceta Médica de Caracas, April 15, 1920.]

Beriberi is one of the scourges of southern countries, notably of Venezuela. He finds that climate is an important factor, hence a change of climate should be advised. The paralytic and edematous forms get well with climatic therapy but the fulminating cases are usually fatal. Food therapy is also of service.

Henry, A. K. SECTION OF ULNAR NERVE. [Br. Jl. of Surgery, July, 1920.]

An example of the presence of a communicating branch in the forearm between the median and ulnar nerves is mentioned by Henry. The surgical importance of the abnormality is emphasized.

Bradford, J. R. ACUTE INFECTIOUS POLYNEURITIS. [Lancet, September 18, 1920. J. A. M. A.]

Bradford writes that acute infectious polyneuritis is a very definite clinical condition, although on clinical and pathological grounds it is not a sharply limited neuritis but a diffuse affection of the nervous system affecting both nerve cells and nerve fibers in the spinal cord, spinal ganglia, peripheral nerves, and to a slight degree the cerebral cortex. It may at times be indistinguishable from the processes now termed encephalitis lethargica or poliomyelitis.

Stevenson, W. C. RADIUM TREATMENT ON WAR NERVE INJURIES. [Br. Med. J., June 26, 1920.]

Stevenson has found that following a nerve operation, or after less severe degrees of trauma to a nerve trench radium stimulation appears to aid and to hasten the return of function in a limb. The nutrition in the area supplied by injured nerves seems to be improved. It may be useful as an aid to diagnosis, and in certain cases will indicate or contraindicate the necessity of operation.

Laignel-Lavastine. PSEUDORADICULAR NEVUS. [Bull. de la Soc. Méd. des Hôp., July 23, 1920.]

The author reports upon an interesting distribution of a nevus. It extended from the neck to the finger and corresponded to an illy defined radicular distribution of the cervical sympathetics of the chest and arm. He relates it in some manner to a dissociated sympathetic syndrome.

II. SENSORI-MOTOR NEUROLOGY

2. CRANIAL NERVES.

Brouwer, B. CLINICO-ANATOMICAL RESEARCHES ON THE OCULOMOTOR NUCLEUS. [Nederland. Tijdschr. v. Geneeskunde, 1917, H 1, p. 1162.]

A middle-aged woman had for some years supraocular headaches with vomiting. A year before admission the left eye showed partial ptosis which soon became complete. Ankle jerks absent, Babinski present on left; a few months later the left knee jerk was absent, right diminished, and there was bilateral Babinski. Gradually the right knee jerk diminished and disappeared; ankle jerks still absent. Legs very slightly paretic. Slight left facial paresis of peripheral type, loss of left corneal reflex, and diminished tactile and pain sensibility of the whole left trigeminal area—greatest in the ophthalmic area—with preservation of thermal sensibility; left motor trigeminal root also affected. All this left trigeminal involvement gradually diminished; later the motor fifth paresis was imperceptible. Vision in left eye very bad (1/15); gradually optic atrophy appeared in it, without evidence of neuritis. Later,

vision in right eye diminished, with narrowing of its color field and pallor of the right optic disc. Then bilateral optic atrophy, worse on left side. Much narrowing of visual fields, especially left. Complete palsy of left third, fourth and sixth nerves; no reaction of left pupil to light; its reaction on convergence could not be tested, owing to the convergence defect. The right eye showed ptosis, slight paresis of internal rectus, and paresis of external rectus. Six months later the left eye improved; its ptosis became much less, and its other third nerve movements improved. The right eye changed but little, except that its abducens paresis increased. At this time the right ptosis was greater than the left; the left eye was in adduction position, and it had slight upward and inward movement. The right eye had abducens paralysis and paresis of internal rectus. Negative Wassermann in blood and in spinal fluid; no pleocytosis; a weakly positive Nonne reaction. Diagnosis lay between tabes or a neoplasm behind both orbits, but radiography showed a normal base of skull. The final diagnosis was an exudative basal meningitis, possibly on a luetic basis, the improvement in patient's condition being attributed to the antiluetic treatment. For five months no change; then one night she was oppressed, screamed thrice, passed urine, and died. Necropsy revealed a flooding of the skull base with blood, due to bursting of an aneurysm of the right internal carotid artery. The aneurysm had pressed on the temporal pole, had flattened the optic nerve and damaged the third and the sixth nerves. When the whole skull base had been sawn out, it was evident that the right-sided aneurysm had grown over the left side and had pressed on the chiasma and on the nerves immediately behind the left orbit. The greater clinical involvement of the left eye and left fifth and seventh nerves was now explained. The left Babinski was due to pressure on the pons. Brouwer suggests that the reflex changes in the legs may have been due to a small aneurysm in the lumbosacral cord, for he found a small aneurysm in the corpus striatum (the necropsy was limited to the brain). He discusses the localization of the various cell groups in the oculomotor nucleus, partly in the light of this case and partly by his special comparative anatomical researches on this subject. He found that in his case the left lateral oculomotor nucleus was normal; on both sides the small celled nucleus was normal. But there were definite changes in the right lateral chief nucleus and in Perlia's nucleus. The right chief nucleus showed loss of cells in its most frontally situated part, and there was smallness of cells in the foremost half of the lateral chief nucleus. Perlia's nucleus showed loss of cells. Brouwer regards the Edinger-Westphal nucleus as the nucleus of origin of the sympathetic nerve fibers for the intrinsic eye muscles. The levator palpebra superioris he localizes in the most frontally situated part of the lateral chief nucleus; the superior rectus cell group lies just behind that of the levator. The medial nucleus (including Perlia's) subserves convergence. The lateral eye movements of the internal rectus muscle are localized in the lateral chief

nucleus; so also are the movements of the inferior oblique and the inferior rectus, the latter being the most caudal. Thus, Brouwer's schema is a slight modification of Bernheimer's and differs from it chiefly with regard to convergence movements. Brouwer shows that Perlia's nucleus is the youngest part phylogenetically of the raphe nucleus.

(Brouwer's full paper on this subject, in German, is in *Zeitschrift für die gesamte Neurologie und Psychiatrie*, 1918, XL, p. 152, with numerous figures and the various oculomotorius nucleus schemata, including his own.) [Leonard J. Kidd, London, England.]

Kisch, Bruno. OBSERVATIONS ON THE ABNORMAL BEHAVIOR OF THE EAR-EYELID CLOSING REFLEX PHENOMENON. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. 48, p. 399.]

By the ear-eyelid closing reflex the author means the reflex closing of the lid when there is thermic or mechanical irritation of the body wall of the ear passage or of the ear drum, as, for instance, when hot or cold water is poured into the ear. The abnormal behavior may consist either in the absence of the reflex, or in a longer persistence than is normal. The reflex is absent in injury of the short trigeminus-facialis reflex arc, for instance in trigeminus paralysis as result of cerebellar tumor of the angle of the pons. Three cases of this sort were observed with absence of the reflex on the side of the affection. After severe skull injuries the reflex is very often absent on one or both sides, probably as result of minute hemorrhages which are inferred to take place in these injuries in analogy with those which occur on an arterio-sclerotic foundation. Sometimes in these patients the reflex is found to be absent only on the side opposite the injury, as is always the case in hemiplegia. Entire absence of the reflex on one side with too long persistence on the other, or too long persistence on both sides has only rarely been observed in skull injuries, but this conduct was quite frequent in *commotio cerebri* without gross injury to the skull, where, of course, functional disturbances in addition to the organic are not excluded (hysteria or neurasthenia). Of 46 cases of skull injury examined (the injuries were often of many years' standing) there was only twelve times normal ear-eyelid reflex. The examination of fresh cases of arterio-sclerotic hemorrhage showed that the ear-eyelid phenomenon was absent on the side of the paralysis, but could be distinctly elicited on the opposite side. After a longer or shorter time the reflex in apoplectic patients may again become normal. In one case of hemiplegia *cruciata* the author found the reflex normal after four weeks. In seven cases of multiple sclerosis the reflex was absent on one or both sides, in three others it was normal; in ten cases of progressive paralysis it was normal in two cases, in five it persisted and was absent in three; in six cases of *tabes dorsalis* it was normal in five and absent in one; in hysteria there was no constant relation between the conduct of the ear-

eyelid reflex and the corneal and of 22 cases of grave hysteria (persons of both sexes), the reflex was normal in 13 (although in four of these the test for the reflex brought on hysterical attacks), in one case the reflex was absent and in eight it persisted abnormally; in 12 cases of undoubted dementia praecox the reflex was normal in 8, in 5 it persisted, and in 1 it was absent on both sides. In persons in whom it was impossible to elicit the reflex by application of heat or cold it was sometimes possible to do so by mechanical irritation. The absence or persistence of this reflex in normal persons (over 200) was never observed, from which it may be assumed that its abnormal conduct has the significance of a pathognostic symptom. The author emphasizes as particularly important the certain proof that the phenomenon is not under control of volition.

Crouzon, Béhague, and Trétiakoff. CONGENITAL AND FAMILIAL OPHTHALMOPLÉGIA. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, July 1, 1920.]

This woman died at 37 from pulmonary tuberculosis. During life she presented complete paralysis of the superior and inferior rectus muscles on both sides; incomplete paralysis of the levator palpebrae and rectus externus, complete paralysis of the rectus internus and of the obliques on the right. On the left there was complete paralysis of the levator palpebrae and superior oblique muscles, while the external and internal recti were intact, and the inferior oblique was partially preserved. The findings of the autopsy were as follows: (1) Malformation of the falx cerebri, the anterior half of which was very poorly developed; (2) extreme atrophy of both oculomotor nerves, especially the right; (3) thickening of the meninges enclosing the emergence of the third cranial nerves. Similar ocular palsies had been observed in the family connections.

Genet, L. THE FACIAL NERVE AND SECRETION OF TEARS. [Lyon Médical, 1920, CXXIX, 791.]

Genet discusses the question of the secretion of tears before the Lyons Ophthalmological Society. The lachrymal gland and the other palpebral glands appear to secrete under different conditions: (1) the trigeminal nerve by a centripetal path and probably by the action of vasomotor fibers; (2) the sympathetic by excito- and presso-secretory fibers, and (3) the facial nerve which provides an abundant secretion of tears. The lachrymal gland is supplied by the lachrymal branch of V^1 , and also by fibers which pass from the geniculate ganglion by way of the great superficial petrosal nerve, the sphenopalatine ganglion, and the orbital branch of V^2 , which anastomoses with the lachrymal nerve either near or in the lachrymal gland. Stimulation of the peripheral end of the trigeminal nerve does not give a flow of tears. In the rabbit

faradization of the tympanum gives a flow of tears, but this no longer takes place after avulsion of the facial nerve. In man a copious flow of tears is produced when alcohol is injected at the point of emergence of the facial nerve; Genet has seen this occur (with facial palsy) within a minute from the time of injection. Shussler found that elongation of the facial nerve for tic gave a great flow of tears. [Leonard J. Kidd, London, England.]

Krabbe, K. H. NEURITIS OF THE MOTOR BRANCH OF THE TRIGEMINUS. [Revue Neurologique, March, 1920.]

An isolated neuritis of the motor branch of the trigeminus is very rare. In a case reported by the author the patient was 17 years old and had influenza in January, 1919. A couple of days after the onset of the symptoms he noticed a difficulty in opening the mouth. This improved but he still noticed a difficulty in mastication of the right side. Some months later there was a noticeable change in the appearance of the face due to atrophy of the right masseter and temporal muscles. There was no involvement of other cranial nerves and no difficulty in talking. He could move the jaw to the affected side but not to the sound side (paralysis of the internal pterygoid). There was no change in sensibility. Although cases of palsy or muscles of mastication in poliomyelitis are reported by Medin, Hoffman and Wickmann, the absence of any other paralysis and the absence of other cases seems to rule it out in this case. Spiller and Camp have reported trigeminus nerve palsy from syphilis but in this case there were no signs of syphilis. The author concludes that it was due to the influenza. [Camp.]

Cushing, H. MAJOR TRIGEMINAL NEURALGIAS AND SURGICAL TREATMENT. [Am. J. Med. Sci., August, 1920.]

The author here discusses five types of facial neuralgia which are not infrequently undifferentiated from trigeminal neuralgia. These may be ascribed to the sphenopalatine ganglion, those secondary to zoster, those attributed to the geniculate ganglion, those accompanying certain cases of convulsive tic, and, lastly, those due to an involvement of the trigeminus by tumors. These types should not be subjected to major operation.

Pichler, H. INJECTION OF ALCOHOL INTO THE GASSERIAN GANGLION. [Wien. kl. Woch., May 20 and 27, 1920. B. M. J.]

H. Pichler, who has treated fifty-one cases of trigeminal neuralgia by injection of alcohol into the gasserian ganglion, is convinced that cure of the disease is almost certain by this method. He points out, however, that the operation is by no means simple or easily carried out, but re-

quires much practice. As it is not altogether devoid of danger, it should not be performed on out-patients. It should be reserved for those cases in which all other methods have been tried in vain, and should be regarded as a rival operation to extirpation of the gasserian ganglion, for which it can almost always be substituted. Local causes must first be recognized and removed. A careful examination, therefore—including the use of x rays—must first be made of the teeth, nose and eyes. The most important and sometimes inevitable complication is keratitis neuro-paralytica. For this reason the injection must be preceded by a careful examination of both eyes. It is not advisable to anesthetize the ganglion with cocaine before the injection of alcohol. Owing to the danger of keratitis the first branch should be spared if possible when it is not affected by the disease. The dose of alcohol required varies considerably, but is not infrequently ten or even fifteen times as much as Härtel's maximum dose of 1 c.cm. The injections may be repeated as often as is desired.

Bierende, F. OCULOMOTOR PARESIS IN PREGNANCY. [Zentralblatt f. Gyn., May 22, 1920.]

Oculomotor complications of pregnancy per se are rare. A case is here reported of a 34 year old women, second child, admitted to the hospital eclamptic. The left eye was entirely closed from ptosis, while the right eye was unchanged. The other eye muscles were not affected. A similar ptosis had occurred during the first pregnancy eight years previously. At that time there was no eclampsia. The paralysis had gradually retrogressed without treatment, and in three months after child-birth had cleared up entirely. Vision was not impaired during the state of paralysis. Also in the second pregnancy the ptosis cleared up a few weeks after the birth of the child.

Rogers, F. T. REGENERATION OF VAGUS NERVE. [Am. Jl. of Phys., August, 1920. J. A. M. A.]

One vagus nerve was sectioned by Rogers and the ends approximated so as to allow regeneration to occur in a series of dogs and cats. The regenerating fibers were stimulated electrically at time intervals varying from one to sixteen months after cutting. These tests made with the animals under ether anesthesia gave no evidence of the regeneration of either cardiac inhibitory or gastric motor fibers. In one dog twenty months after one vagus was sectioned, this nerve was stimulated with the dog in a comatose condition but no ether anesthesia. Distinct cardiac inhibition followed. In two dogs, section of the remaining normal vagus, sixteen and twenty months after previously sectioning and suturing the other, led to death in sixteen and thirty-four days, respectively. Apparently death was due to starvation resulting from difficulty in swal-

lowing and frequent vomiting. During the period of life following section of the second vagus, the following facts were noted: 1. An immediate marked increase in pulse rate followed section of the second vagus. This slowly declined and after eleven to fourteen days the rate was that of a normal animal. At this stage atropin caused a great increase in the rate of the heart beat. These effects occurred in a dog in which the regenerating nerve was not functional for subsequent division of the nerve caused no change in the heart rate. 2. With only the regenerating nerve intact, but with no evidence of it being functional, atropin reduced the gastric motility. 3. The rate of breathing with only the regenerating nerve intact was the same as it was with one vagus intact. Cutting the regenerating nerve led to the classic picture of slow labored breathing. Stimulation of the regenerating nerve above and below the scar caused the normal respiratory inhibition and pressor effects on the blood pressure. Regeneration of the vagus fibers necessary to maintain the normal respiratory rhythm had therefore occurred. Whether these were motor to the larynx or afferent from the lungs was not determined. After bilateral vagotomy, some compensatory process is set up whereby the pulse rate is brought back to normal in spite of the absence of the vagi.

Ranken, D. LABYRINTHINE REACTIONS OF EXPERIENCED AVIATORS. [Br. Med. J., June 26, 1920.]

The author has drawn from his studies of experienced and unexperienced fliers the following conclusions: (1) Experienced pilots have, if anything, a slight tendency toward diminished labyrinthine reactions. (2) Disturbance, present or past, of some other system of the body may affect labyrinthine reactions. (3) Where deafness is present no medical examination of a candidate or pilot is complete without a careful investigation of the functions and reactions of the semicircular canals of both sides. (4) In the absence of a discovery of present or past signs or symptoms pointing to an aural affection, routine examination by means of the Bárány tests is superfluous, provided that a thorough general medical examination is made.

Vernet. TREATMENT OF PERSISTENT VERTIGO WITH ADRENINE. [Presse Méd., July 10, 1920.]

Vertigo is here defined as labyrinthine disequilibrium. If epinephrine can be exhibited at the right moment it should be productive of good results. The common association of tinnitus, deafness and vertigo is due to angiospasm. This the author terms the "syndrome of Lermoyez," otherwise "audible vertigo." It is present in Ménière's disease in which hemorrhage into the labyrinth initiates the triad of symptoms. Different vessels may be involved on different occasions, the cochlear or vestibular arteries, and with spasm in the territory of the former, ver-

tigo is absent, the other symptoms being present. There are as many causes of vertigo as there are cause of vasomotor labyrinthine manifestations. Here belong the numerous toxic, sympathetic, endocrinic, traumatic and local causal factors. The buccal route is recommended in doses of from five to twenty minims of the 1-1,000 solution every two hours for an indeterminate period. It is given to combat a permanent condition.

Dos Santos, Ary. FACIAL PARALYSIS ASSOCIATED WITH VESTIBULAR PARALYSIS IN ACUTE OTITIS MEDIA. [Rev. de laryng. d'otol., et de rhinol., May 31, 1920.]

A twenty-five year old soldier, syphilitic two years previously, developed left acute otitis media following a chill. Shortly thereafter he developed labyrinthine symptoms, namely, deafness, tinnitus and vertigo. Three days later he showed complete left facial paralysis. Recovery took place. Treatment was by injections of pilocarpine hydrochlorate associated with iodide of potassium given internally.

Perret. NEUROTOMY FOR TRIGEMINAL NEURALGIA. [Schw. med. Woch., June 17, 1920.]

A man of 70 years of age is here reported who had suffered severely from trigeminal neuralgia for twenty years, with intervals of transient relief following injection of alcohol and other measures. Perret finally terminated the pain now for three and a half years by severing the nerve back of the gasserian ganglion. This separated the ganglion by the ascending degeneration of the centripetal fibers of the sensory root, but it left intact the nerve ramification passing from the cavernous plexus to the gasserian ganglion, and also the ophthalmic nerve, which was done to avoid neuroparalytic keratitis.

Borries, G. V. T. VESTIBULE PHENOMENA WITH OCULAR PARALYSIS. [Hospitalstidende, July 14, 1920.]

Complete paralysis of the voluntary movements of the eyeball toward the left, with normal vestibular nystagmus were present in this case. His case seems to belong to the subcortical group of ocular paralyses.

Ogden, R. M. HEARING. [Psychological Bulletin, Vol. 17, 1920, p. 228.]

An excellent short general review of the recent literature on the auditory functions.

Book Reviews

Placzek, S. SELBSTMORDVERDACHT UND SELBSTMORDVERHÜTUNG. George Thieme, Leipzig.

The literature on Suicide is voluminous—that which is really valuable surprisingly meager. The dramatic and richly supplemented journalistic plethora is overdone—the so called scientific has been squeezed of all its human values and been reduced to meaningless graphics and oftentimes to statistical monstrosities. To find something in between—where human nature in its agony may meet scientific curiosity in its desire to really ameliorate, not “peep and botanize upon his mother’s grave,” this middle ground of sympathetic research—this literature has been very, very small. Most even of this has dealt with factors of “conscious psychology” and nosological classification.

And the present volume of nearly 300 pages—a great deal of history—too much; some nosology—not clear and too didactic; some excellent paragraphs on suicide clubs, influence of contamination, etc., a readable discussion of prophylaxis—and the whole—to our vision—an excellent, worthy and unilluminated discussion. Not a word of the unconscious psychology which in the last twenty years has entirely altered all the old orthodox historical patterns, from which the present volume does not radically depart.

Duret, A. TRAUMATISMES CRANIO-CÉRÉBREAUX. MÉCANISME ET ÉTIOLOGIE. FRACTURES DE LA VOUTE ET DE LA BASE. SYMPTOMES LOCALISATEURS. Vol. I. Félix Alcan, Paris.

This monumental treatise should have been brought to our readers’ attention before this—but the reviewer thought he should read it—being 1500 pages he stopped and decided to take the rest of the book on faith. Duret has been compiling this treatise nearly 40 years, during which time his wonderful studies on the cerebral circulation have been published, as well as scores of papers on general surgery. We are told that it was near destruction at the invasion of Lille but was spared by the authorities. Duret was able to finish it and it here appears as the most complete treatise on cranial and cerebral injuries extant. Practically all that is known is here and it is not a purely literary composition. It is one filled with clinical experience of every kind. Case records, charts, photographs, sketches, x rays examinations—masses and masses of them. Every case report is here. It is a mine of information for the neurological surgeon and the practising neurologist, medico legal student or general practitioner—a book of reference for every medical library.

Guillain, G., et Barré, J. A. TRAVAUX NEUROLOGIQUES DE GUERRE. Masson et Cie, Paris.

Professor Pierre Marie in very graceful manner introduces this collection of studies as one of the many that gave such striking evidence of the active spirit of neurological medicine during the war. For the volume is made up of a coordinated series of studies made by these two authors while in active service and which had appeared in various medical publications. They are here brought into usable form under six general heads. Studies on Reflex Activities, Injuries of the Brain, Injuries of the Spinal Cord, Concussion without External Injury, Pathology of the Cranial and Spinal Nerves, and *Varia*.

Some new periosteal and tendon reflexes are described in the first series of papers. During the Somme campaign these authors saw many hundred cerebral and spinal injuries. They have analyzed them exhaustively in two chapters. The effects of concussion and the outlining of a very definite concussion syndrome is one of the outstanding features of this very readable and attractive volume.

Kraus, Fr. DIE ALLGEMEINE UND SPEZIELLE PATHOLOGIE DER PERSON. Klinische Syzygiologie. Allgemeiner Teil. Georg Thieme, Leipzig.

This is a remarkable book. It shows how far the elementalistic hypothesis—the cellular pathology of Virchow—has been entirely lost in the newer “organism as a whole” constellation pathology. Here is no crazy patchwork of different diseases of different organs, which has dominated pathology for the past 50 years, and in most places, still does, but an attempt at the working out of a unified concept of how disease really comes to be in an integrated organism—the “Person.”

In his “Vorwort,” Kraus, perhaps the most dominating figure in pathology of today, quotes Claude Bernard as saying “He is convinced that a time will come, when the physiologist, the philosopher, and the poet will talk the same language and understand each other.” When that day arrives a real dynamic understanding of disease processes of all kinds will be made possible. In the present introduction Kraus suggests that this effort at a pathological synthesis of the personality and individuality and their apparently widely separated forms of thinking may be furthered. He has done it in the form of a rewritten series of lectures which have not crystallized over into textbook form but still retain the impetus of the lecture style.

It is a big book—440 pages—large pages—and filled with the most complete and extensive working together of innumerable bits of highly important researches which range throughout the entire structure of medicine from its physico-chemical basement to its sociological attic. We cannot hope even to give any comprehensive idea of its contents. It could only have been written by one thoroughly imbued with the idea that the nervous system is the organizer of the entire body—and although a work on general pathology, it really may be regarded as well a treatise on psychopathology—since

the view point of phyletic psychical organization is the reigning thought in the book.

He thus practically rejects all of the heretofore reigning nosological schemes of disease, *i.e.*, those that do not regard the unity and the entirety of the organism in a functional sense. This unity and entirety are emphasized, and the forces which have built it up analyzed. Special emphasis is laid on Johansen's elements of exact heredity and Kraus develops the conception of the "species" in its widest sense of the individual as a phyletic organization of much greater complexity than usually is thought of in internal medicine. The varieties of human beings in different parts of the globe therefore call for some consideration, which Kraus gives.

The "whole and the divisions of the whole" forms one interesting section and is followed by one on Synthetic Pathology—in which the atrocious word "syzygiologie" is put forth. This whole discussion of constitutional pathology is extremely thorough and stimulating and is followed by an equally attractive one on Thoughts on a Neohippocratic Clinical Program—to which medical educators might well turn. In many respects it reminds one of Mackenzie's recent slashes at our present internist dogmatisms, although Kraus does not stop but sweeps along into his second main theme on "Principles of Organization." We cannot follow him any further. The reader must do the rest.

The reviewer feels this work to be of great importance to neuropsychiatry.

Hochstetter, Ferdinand. BEITRÄGE ZUR ENTWICKLUNGSGESCHICHTE DES MENSCHLICHEN GEHIRNS. I. Theil. Franz Deuticke, Wien v. Leipzig.

This beautiful piece of original research comes from Prof. Fr. Hochstetter, Director of the Second Anatomical Department of the University of Vienna, made possible through the support of the Vienna Academy of Science and the Czermak Foundation.

As is well known, the teachings of W. His, by his many writings on the development of the human brain during the early months of intrauterine life has been the standard for many years, and practically all of the textbooks of recent years have accepted or echoed without critique the findings of His.

Almost for the first time we have here a complete and thorough investigation of much more adequately controlled material from a new standpoint and the student of neuroanatomy who would keep abreast of the work in neural embryology must turn to these studies for guidance.

We are not prepared at this time to enter into a complete discussion of the many points brought out by these studies since only the first contribution has appeared, but to the embryologist and anatomist the volume can be most highly recommended.

De Crinis, Max. DIE BETEILIGUNG DER HUMORALEN LEBENS-
VOR- GAENGE DES MENSCHLICHEN ORGANISMUS AM EPILEPTISCHEN
ANFALL. Julius Springer, Berlin.

This interesting and important Monograph, Vol. 22 of the Foer-
ser-Wilmanns Series, is an extremely profound and fascinating dis-
cussion on the participation of the humoral processes of the human
organism during the epileptic attack. He opens with a short history
of Humoral Pathology from the days of Hippocrates to those of
Rokitansky, then shows the influence of Virchow's Cellular Pathol-
ogy, and briefly traces the re-entrance of humoral pathology into
modern medical science by way of the chemistry of metabolism and
the phenomena of anaphylaxis. Modern studies of anaphylaxis,
blood ferments, and blood coagulation are then placed in relation
to the findings in epilepsy. After a short discussion of the earlier
works of metabolic students in epilepsy, on the relation of ana-
phylactic shock, of protein sensitization, of defense ferments, and of
changes in the blood cells, the author turns to his own investigations
which latter make up three quarters of the monograph. Seven cases
are submitted to the complete series of examinations, the details of
which must be sought in this volume.

Much attention is given to the lipoid content of the blood and
especially the cholesterin content in the serum of epileptics. Very
profound changes in the chemistry of the bodily fluids undoubtedly
stand in close relation to the epileptic attack but the author does not
attempt to state whether they are causes or effects. He intimates
that some therapeutic efforts have resulted from his studies, but
these are only in statu nascendi. The book opens up extremely in-
teresting lines of investigation which ultimately will undoubtedly be
correlated with other findings in this highly important and intricate
problem.

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Original Articles

NOTES ON THE PSYCHIATRY OF 1895 AND OF 1915

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In studying the annual reports of Danvers State Hospital over a period of years one is struck with the changes in diagnostic terms, which probably, though not necessarily, indicate differences in underlying concepts. Interest in these changes in psychiatric thought, together with a desire to ascertain the actual fate of psychiatric cases led me in 1916 to select two widely separated groups of admissions to the hospital for comparison and study. For various reasons, the admissions for the hospital year 1895 were studied, and their relationship to the hospital as of 1915 determined. For comparison, the admissions of 1915 were studied, and I am now able (by courtesy of the Superintendent, Dr. J. B. Macdonald) to report their relationship to the hospital as of 1920. While many questions must remain unanswered; especially with regard to the fate of cases discharged (and lost to sight) and concerning changes in recorded diagnoses and the bases for the diagnoses, nevertheless certain broad questions may be answered which I, for one, have never been able to determine from the usual statistical reports. The changes of psychiatric thought during the twenty years are also clearly brought out, and certain valuable points are there uncovered.

Data of 1895.—During this hospital year, 372 patients were admitted. The diagnoses made were as follows: Acute mania, 30; recurrent mania, 7; acute melancholia, 42; recurrent melancholia, 4; acute confusional insanity, 14; hypochondriacal insanity, 3; fever delirium, 2; "voluntary" delirium, 5.

Probably this group of 107 cases (29.0 per cent.) (what is meant by "voluntary" from a diagnostic standpoint is not clear—though the legal differentiation is plain enough) includes the curable or recoverable types.

There were in addition: Alcoholic insanity, 40; habitual drunkards, 3. No efforts were made to separate the various types of "alcoholic insanity," although delirium tremens is mentioned in the list of discharged cases.

Presumably the habitual drunkards were "not insane," and probably the majority of the 10.7 per cent. of alcoholic insanities belong in the recoverable class. At least, that is the common experience, borne out by later reports in which the types of alcoholic disease are separated.

So we have at most a total of 150 cases (40.3 per cent.) in the "not insane" and presumably "recoverable" classes.

The remaining 222 cases (59.6 per cent.) are presumably of chronic, non-recoverable type, and are classed as: Circular insanity, 5; chronic mania, 3; chronic melancholia, 3; dementia—primary, 21, secondary, 25, post-paralytic, 6, senile, 30; general paralysis, 31; primary delusional, 75; imbecility, 9; epileptic insanity, 14.

Doubtless a certain number of cases of "epileptic insanity" would be of the acute type, with recovery from the immediate attack. Since the epilepsy would still be present, it has seemed best to leave them in this fraction.

Of the 372 cases there remained in the hospital at the end of the year 206, or 55.2 per cent. Of the 166 discharged, 40 were recovered, 25 much improved, 37 improved, 2 "not insane," 24 unimproved, and 38 died.

In the 1895 report the condition was given for the first time as of the day of discharge. In previous years the custom had been to transfer, from the list of "much improved" cases, to the list of recoveries, "those who, after discharge, had continued to improve until their friends regarded them as well."

The further course of events is given in Table I.

TABLE I
DISPOSITION OF CASES ADMITTED IN 1895, TO THE END OF 1915

	Discharged					Died	Remain
	Not Insane	Re-covered	Much Improved	Im-proved	Unim-proved		
372 cases admitted in 1895 were in							
1895.....	2	40	25	37	24	38	206
1896.....	2	18	14	17	33	18	104
1897.....		2	0	2	19	9	72
1898.....			2	1	4	6	59
1899.....				1	2	5	51
1900.....					1	2	48
1900-1915.....					18	18	
Total 1915.....	4	60	41	58	101	90	12
Per cent.....	1.0	16.1	11.	15.6	22.3	26.	3.2

A total of 159 cases, or 42.7 per cent., were discharged as recovered (16.1 per cent.), much improved (11 per cent.) or improved (15.6 per cent.). All but 8 of these cases were discharged by the end of hospital year 1896 (a theoretical maximum residence of two years less one day; theoretical minimum of two days), and 102 within the year 1895 itself. From another table in the report, we find that of 59 cases discharged as recovered, 23 were ill less than three months, and 30 were in hospital less than three months; 50 were ill less than one year and 55 were in hospital less than one year. If this is a fair random sample, we may conclude that of the recoverable cases, about one half require less than three months' hospital treatment, and about 90 per cent. less than one year of treatment.

Curiously enough, the recorded number of cases discharged "recovered or improved" (159) is close to the figure (150) thought to represent the recoverable cases (analyzed according to diagnosis). Doubtless many of the cases apparently belonging to the recoverable group did not recover; doubtless also many cases of the other groups did recover; nevertheless, about 43 per cent. of cases admitted recovered or improved sufficiently to be discharged (the latter is a very doubtful term from the standpoint of possible recovery—so many *improve* without recovering); and about 53 per cent. died or did not improve, and about 4 per cent. remain in hospital at the end of twenty years.

Ninety-six patients (26 per cent.) died in the hospital; 56 by the end of 1896. Four others were discharged as "not insane." Excluding these, there were 260 cases discharged, of which number

sixty-six were recommitted from one to eleven times; of these, 15 were discharged as recovered or improved; 25 died; 2 remain (1915) and 24 were unimproved (transferred to other institutions).

The cases discharged and later returned were diagnosticated in 1895 as: Alcoholic insanity, 9; primary delusional insanity, 14; chronic delusional insanity, 3; secondary dementia, 5; general paralysis, 4; circular insanity, 2; epileptic insanity, 3; primary dementia, 2; acute mania, 7; chronic mania, 1; recurrent mania, 1; acute melancholia, 5; chronic melancholia, 1; recurrent melancholia, 3; acute confusional insanity, 2; senile dementia, 1; hypochondriacal insanity, 1; imbecile, 1; acute mania and secondary dementia, 1.

For the 12 patients remaining, in 1915, the 1895 diagnoses were: Primary dementia, 2; alcoholic insanity, 2; primary delusional insanity, 2; chronic delusional insanity, 1; acute melancholia, 1; imbecility, 1; secondary dementia, 2; paroxysmal insanity, 1.

Of these, all but 3 (one acute melancholia, one alcoholic and one imbecility) have been re-classified in the dementia praecox group.

Data of 1915.—In this year there were 662 admissions. They were diagnosticated as follows: Manic-depressive, 117; morphine psychoses, 2; toxic-infective-exhaustive, 23; psychoneuroses, 9; alcoholic psychoses, 50; a total of 201 cases (30.3 per cent.) in the recoverable classes. There were in addition 10 unclassified cases (1.5 per cent.), some of which may be recoverable—a total of possibly recoverable cases of 31.8 per cent.

The remaining 451 cases (67.8 per cent.) include the cases not likely to recover: dementia praecox, 154; general paresis, 78; feeble-minded, 63; paranoid condition, 8; epilepsy, 13; arteriosclerotic psychosis, 56; presenile delusional, 2; senile dementia, 38; organic brain disease, 10; alcoholic psychoses, 29.

The figures for discharges are shown as follows:

TABLE II

DISPOSITION OF 1915 ADMISSIONS, TO END OF 1920

	Discharged				Died	Remain
	Not Insane	Re-covered	Im-proved	Unim-proved		
662 cases admitted in 1915 were in						
1915.....	5	24	141	54	68	370
1916-1920.....	1	15	123	93	95	63
Total.....	6	39	264	127	163	—
Total per cent.....	0.9	5.9	39.8	19.1	24.6	9.5

A notable point is the greater guardedness in the use of the term "recovered." We see that in 1895, 40 per cent. of cases were so diagnosed that they might be regarded as recoverable, while in 1915 32 per cent. might be so classed. In 1895, 16 per cent. were discharged recovered; in 1915 only 6 per cent. The term "much improved" is no longer in evidence. 26.7 per cent. were discharged in the "much improved and improved" group in 1895 and 39.8 per cent. as "improved" in 1915.

TABLE III

DISPOSITION OF CASES DURING FIVE-YEAR PERIOD FOLLOWING YEAR OF ADMISSION

	1895-		1915-	
	372 Admissions were, on October 1, 1900		662 Admissions were, on October 1, 1920	
	No.	Per Cent.	No.	Per Cent.
Discharged as—				
Not insane.....	4	1.0%	6	0.9%
Recovered.....	60	16.1%	39	5.9%
Improved.....	99	26.7%	204	30.8%
Unimproved.....	83	22.3%	127	19.1%
Died.....	78	20.9%	103	24.6%
Remain.....	48	13.0%	63	9.5%

In Table III, these matters are compared. There we note 46.7 per cent. of the 1915 admissions discharged as recovered or improved, by contrast with 42.7 per cent. of the 1895 admissions so discharged. From the study of the 1895 admissions, it seems unlikely that any more cases of the 1915 group will either recover or improve. This is a relatively important point; e.g., we may adopt the five-year period (usually it is assumed to be ten or twenty years) for the study of our case material, since within the five-year period nearly all the changes will occur. For the 1895 cases, all discharged as recovered and not insane, 95 per cent. of those discharged as improved, and 67 per cent. of the deaths were recorded by the end of the year 1897; a maximum period of three years, a minimum of two.

The somewhat higher death rate in 1915 is possibly explained by the increase in general paresis and arteriosclerosis. The smaller number of cases remaining at the end of five years in 1920 is due to the increased death rate, as the percentages of discharges are practically the same.

GENERAL DISCUSSION

In 1915 a total of fourteen clinical groups are recorded, of which general paresis, senile dementia, epileptic and alcoholic psychoses are the only ones represented by name in the 1895 report in a total of 19 groups. To these we may add feeble-mindedness (imbecility of 1895) and arteriosclerosis (post-paralytic of 1895). In Table IV is a comparison of the admission rate for these groups for the two years.

TABLE IV

ADMISSION RATE IN 1895 AND 1915 OF SIMILARLY NAMED GROUPS

	1895		1915	
	No.	Per Cent.	No.	Per Cent.
General paresis	31	8.3	78	11.7
Senile dementia	30	8.0	38	5.7
Feeble-mindedness	9	2.4	63	9.5
Epileptic psychoses	14	3.7	13	1.9
Alcoholic psychoses	43	11.5	79	11.9
Arteriosclerosis	6	1.6	50	8.4

Several features are here of interest. The close parallel of the percentage of alcoholic cases in two such widely separated periods is very striking. Taken in conjunction with the changes reported from many hospitals since prohibition, it is of peculiar interest, but cannot yet satisfactorily be analyzed.

A considerable increase in the admission of the feeble-minded is perhaps not extraordinary. In 1895 the concept of the moron was making itself felt, but social reactions to the presence in the community of the high grade feeble-minded were not yet very great—modern criminology was in its infancy, so that the delinquent was a delinquent and was not necessarily under suspicion regarding his state of mind. Possibly, too, the increasing complexity and speed of modern life are now more overwhelming to the simply constituted than in 1895.

The increase in number of cases of general paresis is to be explained by the greater accuracy of diagnosis, since serological tests make possible an accurate diagnosis much earlier than is possible by clinical evidence alone. The increase in the number of arteriosclerotic cases is more difficult to explain. The total of seniles and arteriosclerotics together is for 1895, 9.6 per cent.; for 1915, 14.1 per cent. Possibly the cases lost to the senile group in 1915 were

transferred to the sclerotic group; possibly the social tendency for institution care for the aged is greater; possibly arteriosclerosis is on the increase. Evidently no precise answer is possible.

The diagnostic terms used in the 1895 report seem quite strange to the modern ear, yet they represent well the standards of the period. "Fever delirium," "senile dementia," "post-paralytic insanity," "general paralysis" and "imbecility" are perhaps the only diagnoses which go further than clinical description and into pathology and etiology.

A standard American text book of the period gives several classifications of mental diseases, and presents the author's conceptions under the following headings:

1. Mania
2. Melancholia
3. Circular insanity
4. Epileptic insanity
5. Dementia
 - Primary
 - Secondary
 - Senile
6. General paralysis
7. Paranoia
8. Idiocy, imbecility and feeble-mindedness.

For the most part the conceptions of these groups are merely descriptive—i.e., syndromes are described, and cases often of quite dissimilar nature are brought together because of a common mental symptom. There is very little with respect to etiology; the groups are not separated according to pathology.

"Catatonia" was believed by the author to be a type of melancholia; "paranoia" was a very important diagnosis, frequently made—whereas the term is now restricted to a very limited group of cases, the restriction due to a belief in etiological and prognostic differences from other types of deluded cases. "Secondary dementia" is a term applied to dementia which is "often a sequel to acute insanities, like mania and melancholia, and to chronic psychoses (sic), like circular insanity and paranoia." "Acute" or "primary dementia" was a term applied to "a form of mental disease characterized in the main from the very beginning by extraordinary psychic enfeeblement."

Our modern terms "dementia praecox" and "manic-depressive" first appear in the Danvers Reports in the report for 1903. For some three years before, "primary dementia with catatonic

symptoms" and "recurrent insanity" of several types (one "with catatonic symptoms") had been used.

In 1915, 40.9 per cent. of all admissions were classed in two groups—manic-depressive and dementia praecox, for which we can make no adequate comparison in 1895. Both primary and secondary dementia may be dementia praecox; but they may also be organic or toxic; acute mania may be manic-depressive mania, dementia praecox, or organic or toxic; similarly acute melancholia. The delusional insanities may be syphilitic, or dementia praecox or paranoia, etc. So it is impossible to translate the older terms into the newer with any great accuracy. But with the change in terms, has there been a change in underlying concepts?

It seems there are important changes in concepts revealing the swing from only clinical description and classification to analysis and diagnosis in the true sense of the term—a swing by no means completed. For surely nearly half of all mental diseases are *not* due to just two processes, now called manic-depressive and dementia praecox. And yet our figures show that a hospital with an extremely competent staff and an excellent method of examining and diagnosing its material, placed 40 per cent. of its cases in these two groups.

But there are many more etiological diagnoses than was true in 1895. Although the term "toxic-infectious-exhaustive psychosis" is of doubtful value at the present time (when we try to specify the toxic or infectious agent) its appearance marks a long step forward toward diagnosis. In 1915, the diagnostic term "general paresis" had an etiological value—in 1895 it represented a clinical description, and alcohol, heredity and other factors as well as syphilis were regarded as possible or probable causes. Epilepsy was then, as now, a clinical syndrome, with many causes; epileptic insanity was "induced by the epilepsy."

In 1895 the following eight groups contained twenty or more cases: Primary delusional, 75; alcoholics, 43; acute melancholia, 42; general paralysis, 31; senile dementia, 30; acute mania, 30; secondary dementia, 25; primary dementia, 21; comprising 297 of the 372 cases. In 1915, 585 of the 662 cases occur in seven groups: dementia praecox, 154; manic-depressive, 117; alcoholics, 79; general paresis, 78; feeble-minded, 63; arteriosclerotic, 56; senile dementia, 38.

With the exception of those groups of established etiology—syphilis, the alcohol and drug group, the somatic cases, the encephalopathic, the senile (the latter may well be questioned)—our pres-

ent-day grouping of cases is on a basis of outcome. With certain types of symptoms and history we associate a certain prognosis. So an excitement is "schizophrenic" (an interpretative term, pushing into etiology) and the diagnosis is "dementia praecox." And we are much better off, pragmatically, than we were in 1895. Certainly, however we have not reached the end. Concerning half our cases we know very little—we do not arrive at a diagnosis, but at a clinical description or clinical diagnosis (a standard medical dictionary defines diagnosis as "the determination of the nature of a disease" and makes a distinction between diagnosis, so defined, and "clinical diagnosis"; "one made from symptoms only, and without reference to pathology").

Even in the groups where etiology is known, there are many unsolved problems, the number of which is increasing daily. To take only one, why do some syphilitics develop paresis?

If we are really to succeed at prevention, we must learn more of the etiology of mental diseases—more of the background of the Freudian wish, if you please—before we can succeed. What is needed most is brains and hard work—the material and opportunity are plentiful.

In 1915 we find psychiatry pushed well out into a new borderland—the field of the psychoneuroses and particularly the psychopathias. This enormously interesting field brings us nearer to everyday life, and takes us in an important direction—the application to the normal of the lessons learned from the abnormal—a cycle which in the end makes for the great good of all.

The progress of the present day seems to me to be in the direction of establishment of etiology; application of the "new" psychology to the interpretation of mental states; the application of the data of all sciences to the problems of mental disease; and the rapid advancement of psychiatry to the level of other medical specialties, an advancement to which the "psychopathic hospitals" have contributed a great impetus; and a continual broadening of the field of endeavor.

SUMMARY

1. Three hundred and seventy-two cases admitted to Danvers State Hospital during the year ending September 30, 1895, have been followed in their relations to the hospital to September 30, 1915.

2. One per cent. were discharged as "not insane"; 16.1 per cent. as recovered; 26.6 per cent. as much improved or improved; 22.3 per cent. as unimproved; 26 per cent. died; 3.2 per cent. remain.

3. All those discharged as recovered and not insane; 95 per cent. of those discharged improved; and 67 per cent. of the deaths were recorded by the end of the year 1897. At the end of the year 1900, 13 per cent. of the admissions remained in the hospital.

4. Sixty-six of the discharged cases were re-committed from one to eleven times. Fifteen of these were discharged recovered or improved; 25 died; 24 were discharged unimproved, and 2 remain.

5. Six hundred and sixty-two cases admitted during the hospital year 1915 have been followed in their relations to the hospital to September 30, 1920.

6. 0.9 per cent. were discharged as not insane; 5.9 per cent. as recovered; 39.8 per cent. as improved; 19.1 per cent. as unimproved; 24.6 per cent. died; 9.5 per cent. remain.

7. 46.7 per cent. of the 1915 admissions have recovered or improved, contrasted with 42.7 per cent. of the 1895 admissions, although there is more caution in the use of the term "recovered."

8. The higher death rate may be due to a higher admission rate for general paresis and arteriosclerosis. The smaller number remaining at the end of five years is due to the higher death rate, since the total discharge rate is practically the same.

9. The majority of the nineteen diagnostic terms of 1895 are merely clinically descriptive, with little basis of pathology or etiology.

10. The fourteen terms used in 1915 are in part etiologic, in part prognostic and in part clinically descriptive.

11. Some significant similarities and dissimilarities of admission rate for various groups appear.

12. In 1915, 40 per cent. of the admissions were classed as dementia praecox or manic-depressive; it hardly seems possible that so much of mental disease is due to just two processes.

13. The fields of advance are (1) toward etiology and (2) the application to everyday life of the lessons of psychiatry.

A STUDY OF PATIENTS SUBJECT TO CONVULSIVE SEIZURES¹

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Upon undertaking a study of this kind it appeared that an appeal to several classes of thinkers in this field of work would necessarily have to be made. There are those who think of the human organism in terms of structure and the most extreme of them would have it dead and static that they might be the more certain of their observations. Then there are those who have become more liberal in their projections. They are masters of anatomy but have developed a lively interest in the living being. They are often overwhelmed by the dynamics of life. More recently are some thinkers who regard the pure anatomy and elementalistic conceptions of physiology as the German who said, while gazing upon Niagara Falls after his friend had remarked at the wonder and splendor of it: "Sure, it's fine; there is nothing to hinder it!" This latter school is busy with gross reactions—behavior, if you please. To them a few altered heart beats or a few pathological respiratory movements are only parts of a greater whole, about which ancient philosophers inquired in the simple words, "What is he trying to do?" On slightly different bases there are at least two classes. Some prefer the study of large groups of patients with respect to many characteristics or functions, in contradistinction to persons interested in few cases or even very selected aspects of a case.

The subject under discussion is of sufficient range to include the interests of any class cited and it is hoped that some of the observations recorded in this study will stimulate the various thinkers in their realms of activity. It is hoped that the near future may bring forth the type of persons that will not fail to see the whole and all of its parts in clear perspective.

For this study twenty patients in St. Elizabeths Hospital were selected at random (except that they possess sufficient ability to co-

¹The writer wishes to acknowledge his indebtedness to Dr. Daniel C. Main, Clinical Director of St. Elizabeth's Hospital, for the encouragement given and interest shown in the pursuance of these studies.

operate somewhat) among those on whom a diagnosis of epilepsy was made on admission. A brief summary of the history of each case follows and hereafter any one of the cases will be referred to by the number which is given to it in this brief history.

CASE 1. C. P. C. A. Born 1860, in Louisiana. Paternal grandfather died at 45, presumably of apoplexy. He weighed about 300 lbs. at death. Has a sister who had convulsions as a child. Father and grandfather drank to excess. Patient is sixth of seven children. Had measles, smallpox, scarlet fever and typhoid as a boy. Epileptic attacks began in infancy and continued to his eleventh year; was free of them until his 18th or 19th year. During babyhood thrown from toy wagon on his head and rendered unconscious for a while. Began school at 5 and went to 18th year, completing 1 yr. of high school. He has done very little work. Has been an observer of the weather and natural phenomena. Attacks are mostly of the grand mal type though they are petit sometimes. At times instead of falling he walks about in a dazed condition. He has threatened violence on his relatives on one or more occasions. He denies venereal infection. Blood Wassermann negative.

CASE 2. W. G. B. Born in Ohio, 1899. Family history appears negative. Patient youngest of 4 children. Usual diseases of childhood. Scarlet fever at 15. Epileptic fits since 9. Had them nearly every day—sometimes 4 or 5 a day. Began school at 8 and went to 14. Learned well. Enlisted in U. S. Navy in 1917. Discharged in 1918 because of seizures. Practiced onanism from 6 to 17. Total abstainer. Denies venereal disease. Thinks onanism brought on attacks, and reproach of teachers and others who learned of it aggregated it. Blood Wassermann negative.

CASE 3. D. J. C. Born in 1875. Labor hard when born. Family history apparently negative. Had scarlet fever at 2. Started to school at 6 or 7. Reached the 6th grade at 15. Failed in 4th grade. Played truant at times. Went to a business college at 15 and also learned barber trade and telegraphy. Worked at various jobs until 1896 when he enlisted in Third Wisconsin Volunteers and was sent to Porto Rico where he served 6 mo. and then returned to Wisconsin. At 8 was struck on head by well wheel. Had malaria in 1899. Had typhoid at 17 after which his disposition seemed to change. Was irritable and argumentative. Spells began about the time of his return from the Spanish War in 1899. Since, he has had 2 trephine operations. Was married at 20 but could not get along with wife. Attacks are of grand mal type and were mostly nocturnal at first, but not now. Wassermann of blood serum negative.

CASE 4. S. G. Born in Philadelphia, Pa., in 1891. Family history apparently negative. Patient second of 3 children. Had typhoid as a child. Had 3 falls as a child and injured his head. In March, 1917, he had a convulsion in bath tub where hot water was turned on and his feet were badly scalded. Went to school from 6

to 14 when he was expelled. Was in an orphanage from 5 to 10. Ran away from home at 16. Wanted to see the world. Enlisted in the U. S. Marines. Has been drunk and arrested for vagrancy. Had gonorrhoea in 1910 and 1917. Practised onanism as a boy. In June, 1918, he was put on the sick list for having what seemed like grand mal attacks. Following this he had hallucinations and delusions of a religious nature. He tends to wander about, not knowing what he is doing at times. Noguchi on blood negative.

CASE 5. A. H. Little can be learned concerning this patient's history except that he was in the U. S. Army in the Philippine Islands at the time of his first seizure. Claims he was hit across the mouth by the horns of an animal while butchering and most of the front teeth were knocked out at this time. Attacks came on about 15 days after this. He is reported to have been a healthy child. Had whooping cough at 2½ yrs. of age and measles at 8. Had nocturia until about 6 yrs. of age. He denies venereal infection. Blood serum Wassermann is negative. Seizures mostly grand mal but are mixed in type. He is religious at times but steals and commits minor crimes if not supervised.

CASE 6. G. W. H. Born in Ohio, 1858. One sister had "fits." Started to school at 7 and went until 19, getting to the highest grade in school. Worked on farm and at carpenter trade. Joined U. S. Army at 35. Served 3 yrs. and was discharged because of epilepsy. He had typhoid at 25. Had usual childhood diseases. Denies venereal infection. Was married at 36. Has a son living. Daughter died in infancy of fever. Used alcohol but denies excessive use of it. First attack at 33. Usually at night. Grand mal type. Attempted homicide and suicide in 1914. Wassermann of blood serum negative.

CASE 7. V. J. Born in Poland in 1873. Much evidence of neurotic determinants in family. Patient 8th of a family of 11, one member of which went insane, and another was a hypochondriac. Had smallpox at 2. When 10 went to Realschule but failed to pass an examination and quit but took a position as clerk for a tutor about 2 yrs. Came to Chicago at 18. Worked as laborer. Went to night school. Won scholarship in Chicago University for passing highest entrance examination. During college course taught night school. Specialized in science and languages. During his Senior year in University he started a fire in a stove and used too much kerosene; stove exploded; ran across street to sister. Took off coat, lay down in bed and had convulsion resembling those he now has. No outcry; no aura; except feeling of illness. Had a love affair which terminated when the girl learned that he was epileptic. He began to read books on mental diseases and kept a diary recording his seizures, which according to his record varied from 7 to 18 a year. Wrote newspaper articles. Became an interpreter for the State Dept. in Washington at which his efficiency varied so as to demote as well as promote him at times. In July, 1909, patient's mental condition became alarming and since, he has presented a most diverse and interesting picture, at times being

violent and threatening. He had gonorrhoea in about 1897 or '98. This worried him. Thinks he has never had syphilis. From puberty he has made a poor sexual adjustment. Wassermann of blood serum negative.

CASE 8. J. J. Born in Washington, D. C., 1881. Father used alcohol freely. Placed in a German Orphan Asylum when young. Failed in arithmetic in school. Got along fairly well in other subjects. Worked at odd jobs. Joined U. S. Navy at 16. Served until 21. Fell in street in New York while on 48-hour leave from Navy. Discharged from U. S. Navy for disability. Married in 1900. Lived with wife 2 yrs. No children. Attacks are grand mal in type and patient usually becomes excited before them and tends to be violent. Wassermann of blood negative.

CASE 9. A. J. M. Age 46. Born in Chicago. Attended school from 6 to 9. Worked in a lumber yard until 14 or 15. Changed jobs frequently following this, not bettering his previous occupational status. At about 20 he enlisted in the First Cavalry in Philadelphia. Did this because he liked horses. Has used alcohol to excess since 18. Practiced onanism as a boy. First heterosexual indulgence at 14. Denies venereal diseases. He was stricken with sunstroke in Aug. or Sept., 1915, in the Philippines, following which he had convulsive seizures at irregular intervals. They seem to come when he feels his best and without warning. He was accused of sexual perversion in the Soldier's Home and threatened the life of the physician who made the accusation. Seizures are mostly of grand mal type. Patient resents talking about his parents and home life. Wassermann of blood serum has been two plus once, and three plus at another and subsequent examination.

CASE 10. L. E. M. Born in Washington, D. C., in 1890. Family history apparently negative. Had mumps and scarlet fever at 6. At 16 he fell on his head from a trapeze. One year after this the epilepsy started as spells of unconsciousness. They occurred at night mostly. They increased in frequency. At 19 he had as many as 16 a day. Was trephined but this did not cure. Worked at various jobs. Practiced onanism from 15th year occasionally. First heterosexual experience at 22. Drunk once only. Drank only occasionally. Seizures of mixed type. Wassermann negative.

CASE 11. W. I. N. Born in Maryland in 1886. Learned to talk and walk at the usual age. At 8 years of age had hemorrhages from nose. At about same age had fainting spells which continued for two years. Had measles and whooping cough at 7 or 8. Attended school from 8 to 17. Never repeated grades in school. Left school to become a clerk in country store at which he worked for 2 months when he came to Washington and took a position with a company, with whom he stayed until admission to hospital. He was married at 25 and 6 months after marriage began having convulsions. At first they were of the grand mal type but later seemed to be petit mal. Following attacks he would become confused and frequently wandered about. Patient states that his mother disapproved of his marriage which worried him somewhat.

Denies venereal disease. Mother thinks his illness was caused by a fall. Patient thinks his illness was brought on by over sexual indulgence. There was some alcoholism in family. Patient total abstainer. At times he is apparently hallucinated and he has definite delusions of a religious character. Blood Wassermann negative.

CASE 12. C. L. O. Born in 1896 in Washington, D. C. Labor rather hard. No alcoholic or psychopathic determinants in family. Oldest of family. Had measles and some "kidney trouble" as a child. Said to have had nocturia longer than the average child. Began school at 7 and got to 6th grade when 15. Began to work in tin shop at 16. Worked irregularly from place to place because of seizures. Seizures began at 7 and were mostly at night. They seem quite frequent and are mostly of the petit mal type. Mother thinks them due to a fall.

CASE 13. E. A. O. Born in Chicago in 1876. Family history apparently normal. Third in order of birth. Measles at 10. Chicken pox at 12. Began school at 6. Did not like school and attended irregularly. Seizures came on in 1902 as sinking spells and have continued about every 4 weeks. They are followed by malaise and severe headache. Blood Wassermann negative.

CASE 14. H. K. Patient knows nothing of his family. Was brought up in an orphan asylum. Born in 1898. He knows nothing of his early life. Went to a school for feebleminded. Got as far as the 3rd grade. Thinks his slow progress in school was because the other children made fun of him. Learned to crochet and knit and embroider. Sold what he made to visitors. Denies onanism as well as any sexual experience. Thinks attacks began at about 8. Can be brought on by being in a hot room a while. They are usually preceded by a feeling of stupidity and weakness. They are of both types. Feels badly after an attack.

CASE 15. I. N. S. Born in Ohio in 1871. Family history apparently negative. Began school at 6 and got common school education until 16. Better in arithmetic than other studies. Occupational history negative. Enlisted in U. S. Army at outbreak of Spanish American War. Was sent to Cuba. In Cuba he had heat stroke which he thinks brought on his convulsions. Had typhoid. Was told he had seizures while in hospital with typhoid before 1899. Worked until 1902 at various jobs. Got married in 1902. Had 2 children. It was in 1904 that dizzy attacks began to come on and got worse until 1907. In 1908 he was forced to discontinue work because of them. At times he became vicious and after a stay at a Soldier's Home was admitted to this hospital. Denies venereal infection. Wassermann of blood negative. Used a drug for a time that contained much chloral. Used alcohol some.

CASE 16. M. S. Born in Pa. in 1889. Family history negative. Learned to walk at 2. Talked at 1½ yrs. of age. Learned well in school. Quit school to make money. Held numerous jobs; some quite good, others poor. Persuaded to join U. S. Army. Denies having heterosexual experience. Denies onanism. Had

convulsions at 16 or 17 in New York which were brought on by being attacked by footpads in Broadway. Lasted nine months and then he had no more until 21 when he had attacks but was cured by a patent medicine. Attacks returned at 24 after being kicked by a horse. Cured again by patent medicine. Sent to hospital in 1917 for epilepsy. Denies venereal infection. Wassermann negative.

CASE 17. H. T. Born in D. C. in 1876. Family history negative except that brother had epilepsy. Lower jaw fractured by kick of mule at 12. Was in bed 6 months following this. Never went to school before this because teachers could not understand him. Cannot read, write, or spell. Had spells following injury to his jaw. Never had any regular occupation. After death of parents was at poor farm. Used alcohol to excess. Denies venereal infection. Spells came about once a month at first. Were of grand mal type. Confused before attacks at times. Has hallucinations and delusions of a religious character. Wassermann negative.

CASE 18. O. B. T. Born in Indiana in 1891. Family history incomplete. Father alcoholic and separated from mother. Patient older of two children. Had ordinary childhood diseases. Went to school from 7 to 15 and reached 8th grade. Worked at different jobs successfully after leaving school. Joined U. S. Navy at 17 and served one enlistment. Never received any court martial. After discharge he went from place to place, never staying at any place long. Thought his mind was affected all the time after discharge from the Navy. Re-enlisted in U. S. Navy in February, 1919. In the same month he was put on sick list for falling from his hammock and receiving wounds about face. More history elicited the fact that he had been at reform school and hospital for insane in Indiana previous to his enlistment. At times he threatened relatives with violence. Blood Wassermann negative.

CASE 19. F. T. Born in Germany in 1880; only son of a family of two. Had usual childhood diseases. Family history negative. Came to this country in 1898. Was in Spanish American War. Went to P. I. Had beri beri there—also malaria. Lost right arm 5 yrs. ago. Was educated at Heidelberg University in art. Thinks his first seizure came about 2 yrs. ago. Denies venereal infection. Seizures of grand mal type. Blood and spinal fluid Wassermann negative.

CASE 20. H. O. Z. Family history negative so far as determined. Born in 1880 in Ohio. Attended school from 6 to 16 and learned well. Worked in meat market until outbreak of Spanish American War when he enlisted in U. S. Army. Was in army 5½ months. Had usual childhood diseases. Had a spasm once while teething. After the war worked at several jobs. Was in Ohio State Hospital for Epilepsy for several years and at Dayton Home for Soldiers for a short time. Had malaria and dysentery in the Army. Used alcohol to excess. Had gonorrhoea at 20. Three months after his discharge from the Army he began to have nocturnal "fits" about once a month and after that they increased in frequency. Thinks malaria the cause of his trouble. Patient is

mentally irresponsible. Will steal or do petty misdemeanors unless watched.

ANATOMICAL CONSIDERATIONS

Clark thinks that some cases of epilepsy may be caused by injuries incident to birth. Birth trauma may have some such effect in a few cases but the many with history of easy birth who have the convulsive attacks have led to the abandonment of such a cause. Spratling² expressed his amazement at a lecture of Virchow's in which he showed hemorrhages of the brain into the cortical substance of such a character that they are usually overlooked macroscopically. In this connection it may be interesting that of my series Case No. 11 appeared to suffer from a rather severe form of epistaxis at about the time his seizures began. Case No. 3 had a sister who bled to death following childbirth. From this it would seem that coagulability time of the blood is a subject deserving of more attention in early epilepsy. Whether or not such hemorrhages would be followed by fibrosis or gliosis it appears that the Ammon's horn is fibrosed in many epileptics who come to autopsy and in some there is a superficial gliosis of the hemispheres. There is also noted a tendency to hydrocephalus in a few cases. More recently it appears that there is evidence for a sleep center in the midbrain which may suffer some kind of damage to produce periodic attacks of unconsciousness.

Clark³ has made the statement that in true epilepsy there is the most marked mental regression of any of the mental disorders. Stimulated by this statement and the work of Adler⁴ the writer felt that if the regression of mental life really were so marked, such cases might show here and there morphological deviations in greater number than the normal. The cases were gone over with the aim of finding as many anatomical deviations as possible and Table I gives the findings in addition to the x ray report for the sella turcica of each case. Table I and the notes with it deserve some discussion. It will readily be seen that only a part of the anomalies of development are detectable at maturity. It is highly important that detailed observations of infants and children be made in order to produce a comprehensive survey, of which Table I is only a rather small part.

In general it appears that the twenty cases present more anatomical deviations than normal people. Fifty-five per cent. of them showed an asymmetry of the head. An even higher per cent. (65 per cent.) showed high palates and Case No. 13 showed an excep-

² Epilepsy and Its Treatment, Spratling.

³ Clinical Studies in Epilepsy, Clark.

⁴ Organ Inferiority and Its Psychological Compensation, Adler.

NOTES EXPLANATORY OF TABLE I

- 1 Obese but not large.
 1₁ Very small naevi on chest and right shoulder.
 1₂ Very long foreskin of penis.
- 2 Very large ears.
 2₁ Right larger than left.
 2₂ Obese but not large. "Chunky" thick neck; head large for body; circumcised; much coarse skin back of glans penis.
 2₃ Pointed index fingers. Penis large.
- 3 Obese.
 3₁ Small naevus at right costal margin.
- 4 Coarse skin of hands.
 4₁ Left nipple larger than right.
 4₂ Obese; chunky.
 4₃ Thick, broad hand; fingers somewhat pointed.
- 5 Double nipple on left.
 5₁ Very narrow hips and small legs; trunk obese.
 5₂ Small naevus in left flank; moles over body.
 5₃ Large umbilicus.
- 6 Loose skin in front of each ear.
 6₁ Short and worn.
 6₂ Very large nipples.
 6₃ Large brown mole-like area on left behind at border of ribs.
 6₄ Stooped.
 6₅ Hair on back. Coarse featured. Large uvula.
- 7 Large ears.
 7₁ Peg-like teeth.
 7₂ Very coarse skin of hands.
 7₃ Large loose skin comes together just below glans inferiorly.
 7₄ Large nipples. Right larger than left.
 7₅ Very large feet. Large hands. Coarse featured. Great toes of feet unusually large.
 7₆ Above left nipple.
 7₇ Penis quite large.
- 8 Birth mark over sacrum quite large.
 8₁ Stooped—pugnacious type.
 8₂ Little finger especially pointed on right hands but all fingers have tendency to be pointed. Large uvula.
- 9 Brown spot on left flank. Small naevus on left upper border of sacrum and on right of mid-line in epigastrium.
- 10 Left nipple smaller than right.
 10₁ Female type of pelvis.
- 11 Coarse skin about neck in irregular areas.
- 12 Stooped.
- 13 Right ala of nose smaller than left.
 13₁ Coarse spots of skin over sacrum and gluteus maximus.
 13₂ Small naevi on chest.
 13₃ Little finger of each hand pointed and curved toward thumb.

- 14 Obese; chunky; large head.
- 15 Round chest; female abdomen and pelvis.
- 15₁ Very small naevi on chest.
- 15₂ Stooped.
- 15₃ Long foreskin of penis.
- 16 Very prominent eye—with tendency to exophthalmos.
- 16₁ Lept nipple lower than right.
- 16₂ Obese. Chunky.
- 16₃ Small naevi at base of neck.
- 16₄ Very large feet with large great toe.
- 17 One testicle was removed because of abscess.
- 17₁ Very obese and chunky.
- 17₂ Small naevi on chest.
- 17₃ Varicose veins of legs quite marked. This patient has a feminine face. The cleft palate and hare lip are only in tendency. One can see where the tissues of the roof of the mouth and gums barely got together.
- 18 Skin is coarse on fingers near nails.
- 18₁ Abundance of skin inferiorly just back of glans.
- 18₂ Obese and chunky.
- 18₃ Hair over sacrum. Finger nails poorly formed and junction of nails and skin seems poorly made. Pointed finger tips.
- 19 Appears brusque—more than alert.
- 19₁ Penis small.
- 20 Tendency to exophthalmos.
- 20₁ Obese.
- 20₂ Naevi on sacrum at right.

tionally high palate. No attempt was made to classify the various types of high palate. Cases Nos. 16 and 20 both present a prominent eye, reminding one of exophthalmos. These cases both present a hydrocephalic type of head and the x ray findings of the sella in both are identical. A tendency to have thick lips and a broad, flat nose was remarkably frequent. Anthropologists tell us that the broad, flat nose is the most primitive type. In 60 per cent. the frenulum linguae appeared unusually large. In some cases it was compound, as if the tongue were held down by a broad band. It was observed that these patients had difficulty in touching the hard palate with the tip of the tongue while the mouth remained open sufficiently to see the frenulum. It will be observed that this act was made more difficult in some cases by the high palate and may be an anatomical basis for speech defect, which will be discussed later. The malocclusion and deformity of the teeth observed in some cases may also bear on the speech defect. There was no case that presented a true ichthyotic skin but several showed a marked coarseness of the skin of the hands especially. Case No. 7 showed a very coarse skin

of the hands. There were no cases of hypospadias or epispadias but several showed an excess of foreskin which is the condition of the infantile penis. Case No. 17 has had one testis removed a few years ago because it became abscessed. From the conception of inferiority of organs, of Adler, this may be significant. The nipples and mammae were defective in a large per cent.

Most of the cases presented a disproportion of the body in some form or other. Several of them were surprisingly obese. The hands presented most interesting anomalies. One or more fingers of both hands in several cases were pointed at the tip and presented the characteristic hand of adolescent hypopituitarism.⁵ This was especially true of cases Nos. 2, 8, 13, 17 and 18. Cases 4 and 7 presented the hand somewhat characteristic of acromegaly.⁶ In Case No. 7 other features of acromegaly seem to be present also. There were small birthmarks on some part of the body in a majority of the cases. In two it was over the sacrum and quite large. Cases Nos. 6, 8 and 15 assume stooped postures and remind one of postures assumed in representations of primitive men.⁷

The x ray findings show some abnormality of the sella turcica in all except three cases. The abnormal types are two: those in which the fossa is encroached upon by the clinoids or bone adjacent to them, and the shallow ones. No study was made of the shoulder blades. Graves⁸ has done extensive work on this part of the body and reports an interesting type of scapula.

It was observed but not recorded in Table I that a number of the cases had larger tongues than normal.

In summarizing the anatomical aspects one must conclude that there are more deviations of development among the twenty cases than among the same number of normal people taken at random. The anomalies, in addition to being mere deviations, seem in part to be those found in dyspituitarism. There are more that possess a tendency to infantilism than toward the acromegalic type though it seems that combinations of both are present. The writer, in making close observation of pictures of epileptics in text books on mental diseases, has observed in part, at least, some of the same anatomical variations as are found in Table I. Figures 1 to 3 inclusive show the most interesting hands.

⁵ See Jelliffe and White, *Diseases of the Nervous System*, Fig. 101, pp. 212; Second Edition.

⁶ *Ibid.*, Fig. 100, p. 211.

⁷ *Ibid.*, Fig. 99, p. 210.

⁸ *The Clinical Recognition of the Scaphoid type of Scapulae and Some of its Correlations*, W. W. Graves, *Jl. A. M. A.*, July 2, 1910.

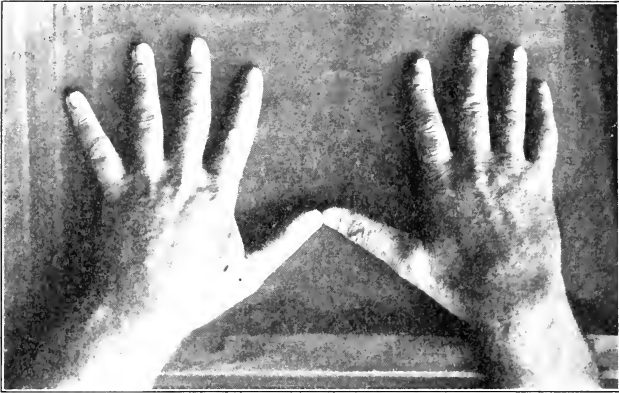


FIG. 1. Case No. 8. Note the pointed finger tips. The hand is quite small.

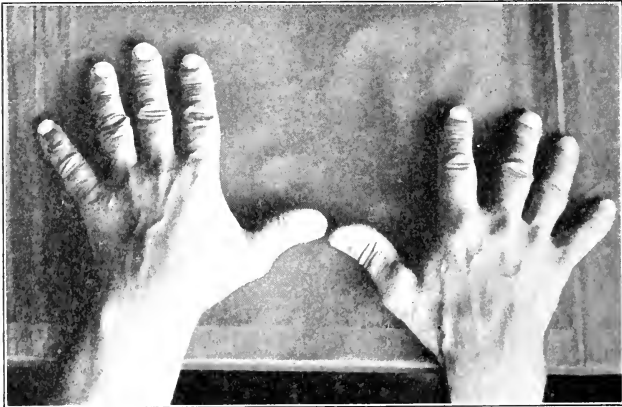


FIG. 2. Case No. 7. Note the broad, short fingers. The hand is very large.

Just as there is a certain mental and emotional character which is peculiar to the individual, so we shall find that there is a certain anatomical character, though altered by disease, nevertheless distinctive of that individual. Just as no two cases of general paresis are alike, but depend on the type of individual, so no two anatomical variants will create the same picture in their end product. This fact has necessitated the most careful judgment, and has left in some cases a feeling of uncertainty.

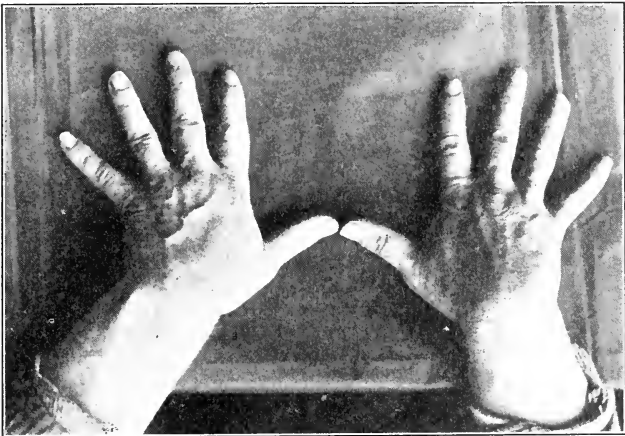


FIG. 3. Case No. 17. Note the pointed finger tips. The hands are small.

PHYSIOLOGICAL AND CLINICAL CONSIDERATIONS

Though it is by no means certain what diversity of function the various parts of the ductless glands have, the general trend of thought regarding them has crystallized into a sort of working hypothesis.

Of the pituitary disorders evidence is that a hyperfunction of the anterior portion after epiphyseal union has taken place creates a condition that sometimes gives enough clinical evidence to go by the name of acromegaly. Acromegaly is a disease which seems to affect either sex and comes on usually insidiously between the ages of twenty and forty. It is characterized by excessive development of hands and feet and facial features. There is often acroparæsthesia, headache, nausea, and even vomiting may occur in a few.

Mentally there may be stupor but as a rule they retain more ability than cretins. They may be exalted. One case reported by Falta and Meyers⁹ was depressed but was easily excited. Diabetes mellitus frequently accompanies the disease. A hyperfunction of the anterior portion before epiphyseal union has occurred sometimes results in the condition known clinically as gigantism. What the hypophysis has to do with the lesser giants about us that we call men of big stature has not been determined. No study has been made of the physiological or psychological qualities of cases of gigantism to know in what particulars they differ from other people.

When there is a hypofunction of the anterior portion early in life there develops what is known as Froehlich's syndrome, or dystrophia adiposogenitalis. It has also been called infantilism and the writer prefers to use that term for a reason to be made plain later. Cases of infantilism usually are very obese, though they may be emaciated; the sexual organs are very small and fail to develop. In males the testes are undescended and the penis is usually small and remains infantile in character. The skin is coarse. The hands may be well covered with adipose tissue and the finger tips are usually pointed. These patients urinate frequently. Diabetes insipidus is often associated with the condition. They eat enormous quantities of food and prefer carbohydrates. They resemble big babies, hence the term infantilism.¹⁰ Mentally they may be up to the average. They usually present a marked contrast to the stupidity of cretins. They are restless, often irritable, and may even show a gay temper. According to von Frankl Hochward¹¹ they may become psychotic.¹²

Tucker, Timme, Shaw, Munson and a number of other workers in this country have done much work on the relation of the pituitary body to epilepsy. X ray findings show often in this condition what was found in my series. Good therapeutic results have been obtained in some cases by the administration of dried pituitary. Cushing¹³ gives six reasons why hypopituitarism is related to epilepsy as follows:

1. Sir Victor Horsley noted motor cortex hyperexcitability in canines after hypophysectomies.
2. Cushing observed a tendency to epileptiform convulsions in animals kept for long period after partial hypophysectomy.

⁹ The Ductless Glandular Diseases, Falta and Meyers.

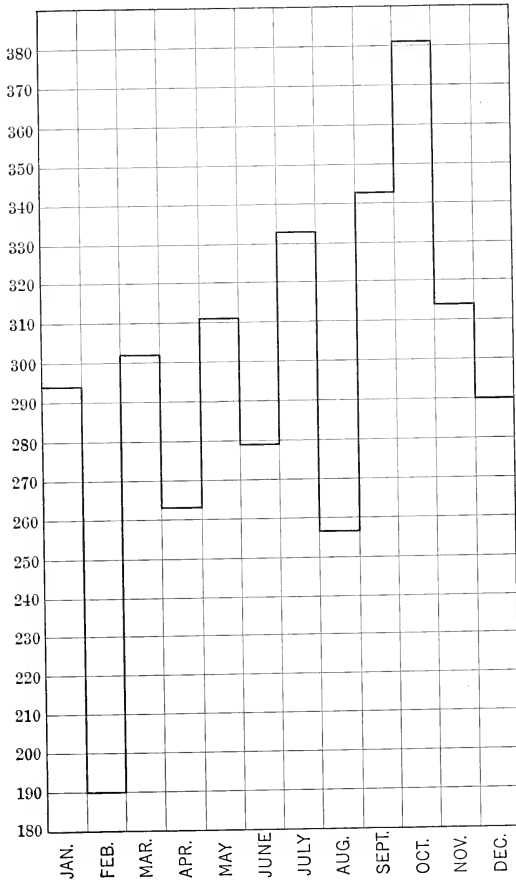
¹⁰ There are other and very different types of infantilism.

¹¹ Quoted by Falta and Meyers.

¹² The writer observed rather recently one case of infantilism, 11 years old, in whom the behavior was decidedly infantile.

¹³ The Pituitary Body and Its Disorders, Cushing.

3. Epilepsy is a frequent accompaniment of clinical conditions in which an insufficiency of the gland is manifest.
4. The pituitary body is prone to be damaged from bursting fracture of the base of the skull.



CURVE I. Record by months of the known convulsive seizures of the 20 cases, since 1903. Total, 3562.

5. It is believed the posterior lobe secretion enters the cerebrospinal fluid and thus bathes the cortex with a substance which is essential to the functional stability of the cortical cells.

6. Many individuals supposed to be suffering from so-called genuine epilepsy present symptoms of hypophyseal deficiency and in some of these hypophyseal extract has served to moderate the seizures.¹⁴

It has been observed that in dyspituitarism there is also a tendency to other ductless glandular disorders. What should be their cause, is not certain. That in my series there is evidence for ductless glandular dysfunction may be seen from the anatomical findings in not a few cases.

In order to learn more about the seizures themselves and certain other aspects of the patients' lives, several investigations were carried out. Two questionnaires were made, No. I pertaining to the seizures, and No. II to miscellaneous facts. These questionnaires follow on pp. 122 and 123. The questions were answered as best they could be in personal interview with the patient. Much of the information derived from the answers to these questionnaires will be discussed in the psychological considerations to follow. An attempt to learn the time that it takes food to pass through alimentary canal of patients gave results as found in Table II.¹⁵ Curve I,¹⁶ on p. 121, is merely an attempt to see at what time of year convulsions occur most frequently; it represents a general tendency. A discussion of part of the data collected bearing on the physiological aspects will be found worth while. It is noted that three cases had convulsions early in life. It would be interesting to know if these cases had rickets, for in this disease there is an altered calcium metabolism—a characteristic which is also present in some cases of dyspituitarism.

No. I

Questions Concerning Seizures of Epileptics

1. When did he have the first seizure?
2. As a child was he subject to convulsions or spasms?
3. What does he consider cause of seizures?
4. Description of conditions under which he had first seizure.

¹⁴ Hypopituitarism in its Relation to Epilepsy, Beverly R. Tucker, Virginia Medical Semi-Monthly, Apr. 7, '16.

¹⁵ Dr. D. C. Main reports a case of convulsive seizures in a patient with a stricture in the duodenum. Removal of the stricture brought about almost complete recovery.

¹⁶ No explanation of this curve can be offered.

5. When did second seizure come?
6. Were they regular or irregular at first?
7. Did they tend to increase or remain constant?
8. Did emotions, as anger, fright, etc., provoke attacks or make them worse?
9. Did constipation or bodily ailments make attacks more frequent or make them worse?
10. Age at which attacks began?
11. Were they mostly in day or night?
12. Were they preceded by aura?
13. Is there any pleasure about aura?
14. Is there any pleasure about attack?
15. Is there ever aura without attack?
16. Are they severe or mild?
17. Do they vary in severity?
18. Does he lose consciousness in attacks?
19. In what part of body do attacks start?
20. What part of body is affected worse?
21. Describe an attack.
22. Does confusion precede or follow attacks; give nature of same.
23. On which side does patient fall?
24. Pulse during seizure. Normal.
25. Does he perspire during an attack?
26. How long does a seizure last?
27. Does he feel badly after an attack and how long does it take him to recover?
28. Are attacks better or worse in summer?
29. Does he urinate or defecate during an attack?
30. What color is patient during an attack?
31. Are the attacks related to sex in any way?
32. What is disposition of patient between attacks?
33. What is disposition of patient just before an attack?
34. What is disposition of patient just after an attack?
35. Does he lose his speech following a seizure?
36. Is he defective in hearing or vision just after an attack?

No. II

Miscellaneous Questions

1. What treatment has he received?
2. Is he deteriorating mentally to a noticeable degree?
3. Is he normally defective in sight or hearing?
4. Does he have an unnatural appetite?
5. Does he like cheese? Does it agree with him?
6. Does he feel that he is compelled to do some things?
7. Is he hallucinated?
8. Is he delusional?
9. Does he dream; what of, and are the dreams pleasant or unpleasant?

10. Does he have any unusual abilities, as in music, art, invention?
11. Has he been subject to nightmare, sleep-walking, talking?
12. Does he sleep well?
13. Does he go to sleep quickly?

A not inconsiderable number of cases report that constipation seems to make their condition worse. The consideration of this fact, as well as calcium metabolism, will be discussed later. The aura was described as a sickly feeling in a number of cases—usually associated with the heart or stomach.¹⁷ That the attacks produce profound physiological changes may be seen from the fact that the pulse is usually greatly accelerated, and the patient usually perspires freely during or after a seizure. Many lose control of sphincters during attacks and there is usually a severe headache or malaise afterward. The face is often flushed or cyanotic and with it is in most cases a marked dyspnea during the convulsion. To those who adhere closely to the theory that there is most marked regression in seizures, it may be said that the physiological phenomena observed are those in striking evidence at birth. The writer has frequently seen Case No. 12 in an attack and the scream preceding and during the attack with dyspnea remind one of an infant newly born gasping for breath and making its first cries. By a rather crude test—the watch test—the writer felt that most of the cases were slightly defective in hearing.¹⁸ Case No. 19 suffering from olfactory hallucinations during excitement preceding the aura, could not smell oil of cinnamon. Several of the cases seemed to have an enormous appetite, and it was observed that most of these were the interesting anatomical group.

By feeding charcoal to patients at meal time, it was possible to get the data of Table II. The time for food to appear at the rectum after ingestion in no case falls out of normal limits. The time that was required for the colored food to be entirely eliminated is rather long in several cases. Some writers have considered deficient alimentation as a cause of epilepsy. What place stasis may have will be discussed under chemical considerations. Likewise deficient calcium of the blood¹⁹ and increased intracranial pressure²⁰ will be given consideration not as causes but as factors in the physiological mechanisms predisposing to convulsive seizures.

The speech of epileptics seems characteristic. A defect was found in most of the series. Case No. 10 was a stammerer before the attacks began. As has been pointed out, there are high palates,

¹⁷ May have some relation to Kempf's theory of autonomic tensions.

¹⁸ The writer hopes to investigate color vision later.

TABLE II

Case No.	Hrs. from Ingestion of Charcoal Until it Appears in Feces	Hrs. from 1st Appearance of Charcoal in Feces Until it Ceases to Appear
1	21.	21.
5	36.75	24.75
6	37.	
7	24.	
9	24.	9.
11	21.5	44 plus
12	24.5	47.5
15	17.	51.5
16	31.5	
19	46.	
20	28.	40.
Normal—X-Ray	36.	12.

thick tongues and tongues with restricting frenuli among the series. The speech defect is a sort of repetition of a word or phrase here and there. The writer prefers to represent it by a series of overlapping lines, thus:

A.....

B

The stream of talk is not continuous but overlapping. One writer has likened it to stereotypy; in fact, he called it a stereotypy of speech.²¹ This is a type of speech that one frequently finds in children.

Before coming to some theoretical considerations of diet and the chemistry thereof it may be well to summarize the physiological aspects of our cases. They are unstable and undergo profound changes within short intervals. As regards food and comfort they are in many respects infantile and in their periodic reactions there are evidences that they are characteristically infantile as well as adult. The infantilism may not be constant but may appear at irregular intervals and makes a most motley and incongruous character.

THEORIES REGARDING THE EFFECT OF CERTAIN FOODS ON EPILEPTICS

It has been an observation of some standing, though not so reported by a majority of my series, that cheese used as a diet for epi-

¹⁹ The Use of Calcium in the Treatment of Epilepsy; John Bryant, Boston Med. and Surg. Jr., Oct. 7, 1915.

²⁰ The Treatment of Epilepsy, Israel Bram, N. Y. Med. Jr., Nov. 20, 1915.

²¹ Palinphrasia in Epilepsy with a Report of Cases, L. F. Robinson, Jr. of Med. Soc. of N. J., 1915.

leptics increases the frequency and severity of convulsive seizures. Aside from the mechanical conditions which it creates in the bowel, the chemistry of cheese is deserving of consideration. Table III gives the per cent. of the two proteins found in human and cow's milk; also the total protein of both.²²

TABLE III

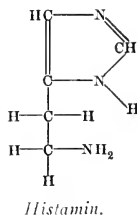
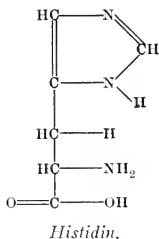
	Human Milk	Cow's Milk
Casein5-1.5%	3-4.0%
Lactalbumin1-.3%	.3-.4%
Total Protein7-1.5%	2.5-4.0%

It will be seen from this table that most of the protein of milk is casein. Cheese contains some fats but is largely casein. If one is liberal and estimates the casein at 4 per cent., it requires 25.4 ounces of milk to produce an ounce of cheese which is often eaten at a meal. Casein is a unique protein in certain respects. It contains very much of three important amino-acids, viz., histidine, tyrosine, and tryptophane. There are other foods that contain one of these amino-acids in considerable quantity but there is no food thus far studied that contains the three amino-acids in such quantities. Table IV gives the per cent. of each amino-acid in cow casein.²³

TABLE IV

	Tyrosine	Histidine	Tryptophane
Cow's casein	4.5%	2.59%	1.5%

The importance of the above-mentioned amino-acids has been emphasized in recent years as a result of the great interest in the endocrine organs. Tyrosine (B-parahydroxyphenyl, α amino propionic acid) has the following formula:—



²² From Mathews' Physiological Chemistry.

Hart, Zeit. physiol. Chem., 33 (1902).

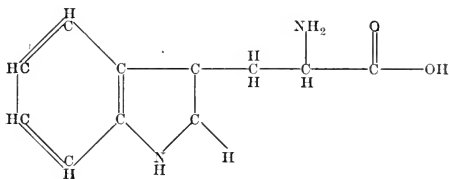
Morner, Zeit. physiol. Chem., 34 (1902).

Osborn and Guest, Jr. Biol. Chem., 9, 333 (1911).

²³ Abderhalden, Zeit. physiol. Chem., 44, 23 (1905).

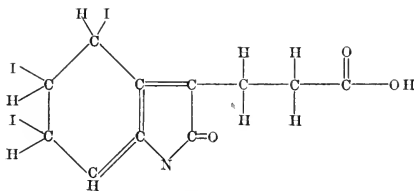
along with the formula of adrenaline. It has been theorized that because of the close relationship which exists in the formulae of these two substances that probably the tyrosine which is recovered in the end stage of protein digestion is utilized somehow by the body in the manufacture of adrenaline.

Histidine, also an end product in protein digestion, has the following formula:



Tryptophane.

By the removal of the CO₂ from histidine, a toxic substance, histamine, is produced:

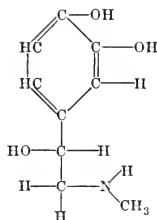


Tyrosin.

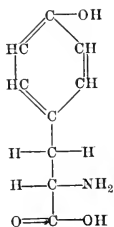
Abel contends that histamine and pituitrin are identical substances. The pharmacology of each is so very similar to the other that they must be closely related substances. A bacillus called *B. aminophilus*²⁴ has been isolated from the intestinal tract of man which has the ability to decarboxylize histidine and produce the toxic histamine. Some workers²⁵ have advanced the view that histamine may be the cause for dementia praecox. It seems quite probable that the body may utilize histidine in the manufacture of the active principle of the posterior portion of the pituitary body. It can be seen that under some conditions intestinal stasis may produce an excess of a pituitrin-like substance.

Tryptophane, another end-product of protein digestion, has the following formula:

²⁴ Chemical Abstract, Vol. VI, p. 3443; Vol. VII, p. 626.

*Adrenalin.*

By the recent work of Kendall²⁶ at the Mayo Foundation, the active principle of the thyroid gland has been isolated and for it he gives the following formula:

*Tyrosine.*

This substance, thyroxin, it will be observed bears a striking resemblance to tryptophane. It has been spoken of as an iodized tryptophane. It also seems quite probable that tryptophane is utilized by the body in the production of the active substance of the thyroid gland.

Adrenalin is the most powerful vasoconstrictor in existence. Cannon²⁷ has shown that this substance is released in considerable quantities in anger, pain, fear, and rage. It constricts the abdominal vessels and causes the blood to be forced into the limbs and head. It releases sugar from the liver. It increases the coagulability of the blood. It increases the efficiency of the musculature. Cannon speculates that it creates the most favorable physiological condition for dealing with the excitant of the emotions—to engage in flight or fight.

²⁶ Chemical Abstracts, Oct., 1919.

²⁷ Bodily Changes in Hunger, Pain, Fear and Rage, Cannon.

Pituitrin is a substance which is thought to have some function in parturition. It increases blood pressure by a different mechanism from that of adrenalin. It is a powerfully active substance and causes smooth muscle to contract.

Thyroxin produces, when given in sufficient dosage, all the cardinal symptoms of toxic goitre, viz., tachycardia, nervousness, increased blood pressure, and increased basal metabolism and vasomotor disturbances. The details of the pharmacology of this substance are not yet worked out.

These three substances, which are all very powerful in their action on the circulation, are probably produced from the amino-acids found most abundantly in casein of cheese. Thyroxin in its action disperses energy rather uniformly over the body by the tremors and increased metabolic rate. Adrenalin has been known to produce unconsciousness when injected in large doses. These substances all disturb in one way or another the vasomotor system which is said to be the causative agent in ordinary fainting spells. Epileptic convulsions may resemble a fainting spell or be very different from it.

A further study of the effect of diet on man has been noted by Mercier.²⁵ He observed that certain patients who used little meat and much fat either in the form of butter or fat meat, complained of nervousness and depression. Upon reducing the fats and eating some lean meat, the nervousness and depression disappeared.

The physiology and chemistry of this process may be worthy of analysis. Fats are retained in the stomach longer than other foods. They coat over, so to speak, other particles of food and make them impervious to the digestive juices. Retention of fatty foods in the stomach a long time permits fermentation to take place in some instances. The result is an acute gastritis, and often nausea and vomiting. Fats once in the intestine are split into glycerine and fatty acids. In these forms fats are soluble and those that are taken up by the blood stream or lacteals are carried away. But before the fatty acids are carried away, an important and insidious chemical change is likely to take place. Fatty acids, such as oleic and stearic, unite readily with calcium to produce insoluble salts. (The flakes formed when one uses soap in "hard" water, is an example of the insoluble calcium salts.) In this way, the body gradually becomes decalcified to the point of irritability (nervous-

²⁵ C. Ceri, *Cerebral Concussion—Dementia Praecox Studies*, July, 1918.

²⁸ *Dementia Praecox Studies*, Mercier; July, 1918.

ness). Infants fed a fat, rich milk become irritable and tend toward spasmophilia. Calcium seems to reduce the irritability—to quiet.²⁹

PSYCHOLOGICAL CONSIDERATIONS

From a reconsideration of the answers to questionnaires Nos. I and II, some facts bearing on the psychological nature of the cases are revealed. Causes for the convulsions were given as falls and injuries, sunstroke, disease, over-work at mental tasks, masturbation and sexual overindulgence. In some cases the first seizure occurred under very obviously painful mental situations. In others there seemed to be no relation of this kind. In some the seizures were regular and in others irregular. Most thought that emotional conditions made attacks worse. One patient, No. 13, said that an erection of the penis would bring on a seizure. It is strange that many of the attacks occur at night. Dreams might explain the attacks if one were to attribute them to some psychic origin. In most cases there is an aura and strange to say a few patients frankly stated that the aura is pleasurable and that even the attack itself would not be bad if not followed by the malaise. Case No. 1 enjoys the attack usually and does not feel badly afterward. Many of the cases have the aura without the attack. One patient who has such experiences thinks that this is *prima facie* evidence that he has control at those times of his disease. It is to be wondered if there are not many people who possess the epileptic character who never have more than the aura. Attacks seem to vary much in severity in most cases. For the most part the patients have grand mal seizures. In Case No. 9 with a positive Wassermann, the patient is given no warning in the form of aura and says that the attack is as if a shot had struck him. Patients are confused after attacks usually for some time and in some instances before. A few patients declared that the attack reminded them somewhat of a sexual experience.

An effort was made to collect those experiences which might be considered nearest the so-called archaic type of reaction. Case No. 15 reports that following some attacks he has seen a rainbow colored cross. Case No. 4, if he has a seizure in daytime, prefers to go to the dark to have it. Case No. 19 has olfactory hallucinations before and following seizures. These characteristics of Cases

²⁹ Esquimos, who consume much fat, live a very short life. Oxalic acid which produces an insoluble calcium oxalate when taken into the body produces, in its toxic effects, tetany and a spasmodic death.

Nos. 4 and 19 are evidences of regression to an early level. Several stated that at times they felt moved by some compulsive force and were not responsible for what they did. Many of them are hallucinated and delusional part of the time. The delusions tend to be of a religious variety and to some the vision and voice of God appear occasionally. This is evidence of a regression to the childish ideas of God. Most of the patients experience dreams usually of a pleasant character. The scenes of the dreams are often of childhood and may be said to be wish-fulfillment dreams. The sleep of patients is usually sound and after retiring they go to sleep quickly.

It was desired to see if evidence could be collected which would show the tendency of epileptics to regress. Each night for four nights the twenty patients were observed at various parts of the night to see what position they assumed in sleeping. Table V on p. 132 shows the result of the observations on the twenty cases as well as the statement of 44 normal people as to how they lie, for the most part, in their sleep.

Karl Braun in his account of over 45,000 obstetrical cases concluded that the left occipit anterior position occurred in 70 per cent. of the cases before delivery. In a pendulous abdomen it will be observed that in this position the right side of the foetus, due to the force of gravity, comes most in contact with the mother and should probably receive most stimulation: or at least, the stimulation of the right side of the foetus is the latest prenatal stimulation in 70 per cent. of the cases. It was thought that if the regression be a really great factor, that in sleep, epileptics would have more tendency to lie on the parts stimulated most in intrauterine life than normal people. The regression of sleep seems to be to an intrauterine posture or attitude, rather than to the position which receives the most stimuli in utero and it is more marked in epileptics than in normal people, if we are to place our reliance on data of Table V.

Clark gives in one of his cases, a classical example of psychological regression following an attack in a patient; earlier in life this patient had been a student of two German teachers, one of whom he did not like. In some attempt to talk after a seizure, he suddenly began to speak German.

Kempf³⁰ thinks that the seizure is frequently the manifestation of an anal-rectal eroticism, as it were, and quotes cases which he has to support his psychoanalytic theory. In further support of this theory is the bad effect of sedatives in many cases of epilepsy, which prevent the attack but do not permit the outlet of energy which Kempf would say was so essential to the adjustment of the cravings.

TABLE V

	Case No.																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
January 3 and 4:	R	R _x	R _x	B	R	R	R _x	R	R	B	L _x	R _x	L _x	R	L _x	L _x	R	L	L _x	L	
11-1 A.M.	L	B	B	R	B	B	R	R	R	B	B	L	L	R	R _x	R	L	L _x	R _x	R	
2-4 A.M.	R	L _x	B	R	B	B	B	L	L	L	B	R	B	R	B	R	B	B	R	R	R
January 4 and 5:	R _x	R	R	B	L	B	R _x	B	R	B _x	R	B _x	L _x	L _x	R _x	R	R _x	B _x	R	R	
11-1 A.M.	L	B _x	L	L	B	B	L	L	R	L	R	B	L	S	R _x	R	R _x	B	R	R	
2-4 A.M.	R	B	B _x	L	B	L _x	R _x	L	R	R	L _x	R	L	R	L _x	B _x	B _x	L	L	R	
January 5 and 6:	B	J _x	R	B	B	R	R _x	B	L	R _x	R	L _x	R	R	J _x	B _x	R _x	L	R _x	R _x	
9-11 P.M.	B	L	B	L	L	B	R _x	B	B	B	B	R _x	R	R	R _x	R _x	R _x	L	L	B	
11-1 A.M.	L	B	B	L	B	B	B	R _x	B	R _x	R	B	B	S	L _x	L	R _x	B _x	R	L _x	
2-4 A.M.	L	L _x	B	R	B	R	B	R	R	B	R	R	R	L _x	L _x	R	R _x	L	R	R	
January 6 and 7:	B	R	R	L	B	R	R	R	R	B	R	R	R	L _x	L _x	B	B	R	R	R	
11-1 A.M.	L	L _x	R	L	B	L	B	L	B	B	R	R	B	L _x	L _x	B	B	R	B	B	
2-4 A.M.	L	B	B	R _x	B	L	R _x	L	B	L	B	R	B	L _x	L _x	R	R	R	L	B	

R—On right side straight.
 L—On left side straight.
 B—On back straight.
 R_x—On right side and drawn up.
 L_x—On left side and drawn up.
 B_x—On back and drawn up.
 S—On stomach.

Per Cent.
 { R—29—
 L—15+
 B—27+
 R_x—13+
 L_x—11—
 B_x—3—
 S—2—

Epileptic,
 239 observations
 on 20 cases.

Per Cent.
 { R—52.4
 L—18.1
 B—11.3
 R_x—11.3
 L_x—6.9
 B_x—0
 S—0

Normal,
 44 cases.

The study of regression³¹ is an unexplored field among the psychotic as well as among normal people. Few unfold until their death. Most of us at fifty or thereabouts begin to retreat into the good old past. The methods of the regression, the character of it, and its suddenness and irregularity, or the early age at which it may begin, may be as varied as the statures or the intellectual differences of men. Atavism is a biological reality gross enough only occasionally that it assumes distinctive proportions, but there is a vestige of it in most of us could we but train our eyes to see it.

That in epilepsy there is frequently great evidence for regression, no one would question. It is present in other psychoses as well but in epilepsy it is characteristic in that it is more irregular and is most marked at the convulsion. Anatomically, there is frequently among epileptics a tendency to infantilism and sometimes to acromegaly. Physiologically there is a marked instability, especially at the time of the convulsion. Assuming the truth of these statements, the writer feels that the psychological tendency to regression, whether in an attack or at other times, is only one of the manifestations of the tendency to infantilism existing in the epileptic. In other words, if there is an anatomical and a physiological, there is often a psychological infantilism as well.

Epileptics frequently show unusual abilities. Two of my series are quite good artists. These were the most poorly adapted of all to make social adjustments. Pressey and Cole³² in examining patients who had deteriorated, as well as feebleminded, came to the conclusion that when feebleminded are tested their failures in the scale are rather abrupt and short, while patients who have deteriorated, scatter promiscuously in their achievement against a scale of increasing difficulty. Epileptics with evident inferiorities must cultivate those few intellectual qualities which they possess, to a high degree, in their struggle to compensate. Napoleon and Caesar and

³⁰ Psychopathology, Kempf.

³¹ The writer is convinced that the only way to study epilepsy or any such disease entity is comparatively. For example, epilepsy has something in common with the other psychoses yet it is different. Since it has an altered calcium metabolism it should be studied with rickets, scurvy, and some of the dyspituitarisms. The convulsive types of diseases as eclampsia, uremia, general paresis, hysteria, spasmophilia, tetany, and diseases of this class should be compared. Phylogenetics might give us some insight. The common opossum (*Didelphis virginiana*) when captured in its wild state assumes an unconscious attitude. The writer has heard of two dogs that had convulsive seizures. Clark reports a canary with an epileptic condition. Rhinocophora and many common beetles fall as if dead when touched. Physiologically the convulsion may be looked upon as a massive reflex akin to shivering or tremor of fear or anger. In addition, there are the many types of epilepsy itself and epileptic equivalents.

well-known men of culture of our time are examples in point. But the gross reactions of these men are usually as strong as their weakest trait.

It might be well to consider some of the conditions under which one of the cases began to have his seizures, by going into some detail in his history.³²

The mother had paralysis and aphasia seven years before death, much of which disappeared. The father had pneumonia at 28 and rheumatism at 72. It is said that the father had a convulsion when he had pneumonia, but this is not certain. A sister of the mother went insane when compelled to face the exile of her children.

The patient had smallpox at two, at which time he began to talk in a stuttering way. Went to the elementary school at eight and scientific school at ten, but because he failed in an examination, left school. Took a position as a clerk which he held two years. At eighteen he came to Chicago where his father and brothers were; worked as a laborer for a time and attended night school. After eight months he was appointed teacher of English to some foreign pupils. He took a course in high school and entered the University of Chicago in 1893 with a scholarship for having passed the highest entrance examination. During his college life he continued to teach in the night school. He was graduated in 1897, having specialized in science and modern languages. During the last year of his university life the patient started a fire in a stove, poured too much kerosene on the fire and an explosion occurred. He ran across the street to his sister, took off his coat, lay down on a bed, and had a convulsion resembling those he had subsequently. There was no outcry and apparently no aura except a feeling of illness.

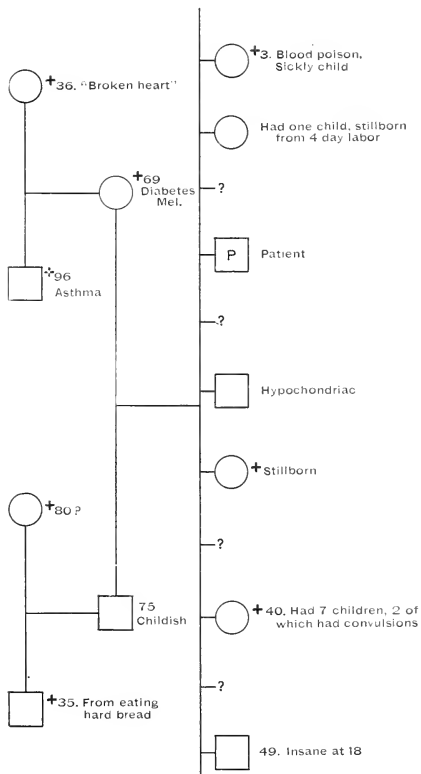
The patient fell in love with a girl and wrote verses to her. Eight months later he was told by his brother that he had epilepsy and should never marry. The girl was told of his affliction and gradually withdrew from his company. Later, on a lake trip, he had the second convulsion. The patient called this sea-sickness. Following this he began to read books on epilepsy and mental diseases and took several forms of bromide salts. While waiting for an appointment from Washington he went to a city, D—, to take an examination for the position of high school teacher. He had some differences with the authorities about the position. That night in order to pass the time he went to a theatre and while in the

³² Irregularity in a Psychological Examination as a Measure of Mental Deterioration, S. L. Pressey and Luella W. Cole, Jr. of *Abnormal Psychology*, Dec., 1918.

³³ "Few observers have been able to withstand the temptation to 'elaborate the obvious'—in this case to study and re-study convulsive phenomena. This tendency is all the more noteworthy as practically all authorities agree in these statements: that true epilepsy can occur without convulsions; that the convulsions may be simulated by those of other diseases; that the mental state between convulsions is as typical of epilepsy as are convulsive seizures."—Quoted from "A Clinical Study of Epileptic Deterioration," *Psy. Bul.*, Vol. IX, John T. MacCurdy.

gallery felt an uncontrollable impulse to jump from it. He went to his hotel and thinks he had several convulsions there.

Within a short time he came to Washington to be employed in a very special capacity because of his knowledge of languages. He recorded in his diary the seizures each year until his admission to the hospital. In 1901 the girl with whom he was in love died and in



CASE No. 7. V. J. (The ones not accounted for must have died in infancy.)

this year he ceased the use of bromides. The next year he sent the brother of his sweetheart to school and paid his way but the boy did not honor his opportunity and discontinued school. In 1903 he wrote many newspaper articles, especially on science. In 1904 he

received from a physician the suggestion that he had a tapeworm and was treated for it. Was operated for hemorrhoids the same year. During this year he received a promotion and discontinued the use of salt from his diet. The next year he was demoted. It is interesting to note that just preceding his demotion he had more convulsions than he had experienced in any year of those recorded in his diary. Whether the impending demotion was the cause or effect is hard to say. He began the use of bromides again. In 1906 he translated an idealistic, mystical metaphysical poem which seemed to have much influence on him. He began to infer that his mother had diabetes and spent much time with her.³⁴

In February, 1909, his mother died and he thought the mother of his dead sweetheart came wherever he was. In June, 1909, he discontinued bromides. Slept in open air. Patient noticed that convulsions came at about the time of nocturnal emissions and a physician whom he consulted told him to visit a prostitute. He followed his suggestion but had no erection at first visit. On second visit he had an erection but no ejaculation. Patient became apprehensive after this but was persuaded again to have hetero-sexual relations and claims to have had normal relations. He discontinued foods without salt.

On July 5, 1909, the patient had convulsions following the escape of gas in his room; on July 7 had another; on July 8 had eight, and four the following morning. He ceased to pass urine and feces and was delirious for 5 days during which time he imagined himself to be Satan and that he had raped his sister. He saw his mother as a little girl and another of his relatives appeared as a little boy. Claimed he could see through the walls, saw maps of Europe on the ceiling, etc. He had to be catheterized and the feces taken from him. He was told by a physician that there was nothing wrong with him and in two days he was back to work. He gained 10 pounds in weight and wanted to marry. Ten days later had headache. He was reprimanded by his brother-in-law for something he had done wrongly, got excited, and had a sleepless night with convulsive attacks during the night. Returned home from work a short time after this, stating that he had foolish thoughts and did not care to show his condition to strangers. A month later he started a fire in the bathroom with paper and inflammable substances and called "Burn the house." He was admitted to the hospital the next day. He talked about inventions, plans to free the Poles, poetic ability, and would give a mystical turn to his conversation. He washed his hands many times for a number of days. From this point an irregular account of his history containing only special features will be given.

After a visit by a brother-in-law who criticised him severely for his inventive ideas, he became excited and dizzy: says that he may even have been unconscious. He thinks his dizziness due to the fact that he could not defecate as much as possible.

³⁴ When he was well established he had his family—father, mother and sister, come to where he was employed that he might have a home.

In his own words is the history of his early religious life. "As a child I was brought up in the Catholic faith. Up to 13 years of age I was very devotional, most religious of the family. My brother was attending the Gymnasium and brought home a Polish translation of Büchners *Kraft Und Stoff* (materialistic philosophy of energy and matter). I read the book and thought I was an atheist and dropped all forms of devotion. Legally I had to be a member of the Catholic church and study Catholic religion in school but I did not have to attend church services. I kept up such views until about my first year of college, or about the 21st year of my life. As an atheist I would many times get in some small discussion with older people who used to treat my views in a humorous way and would express their sorrow and regret. My change from atheist to the faith of immortality occurred with an incident which I shall describe. I studied science, had prepared for such partly by self study of botany and physics. One time during laboratory work I looked through the microscope on a drop of water containing infusoria. A thought came to me suddenly and I spoke 'That could not be without God!' Since then I ceased to be atheist. I understand only Life and consequently believe in the Highest Lord of Life. Death is nothing to me except a part of life."

He knew nothing about sexual matters until 13 (the same year that he changed so profoundly his religious views). At that age he masturbated, was warned by a relative, and stopped for a time. Between 14 and 20 he often thought of going to women but thought that to be a very bad thing, for he thought women the equals of men and that to have sex relations with them would not be treating them as such. A further account of his sexual history shows it to be abnormal. A statement as to how he understood sexual matters after his admission to the hospital sounds to one like the statements of a child—an element of mystery pervaded the whole idea and one gets the idea of his leanings toward homosexuality.

In an attempt at free association, the number 1323 was given to him by the examiner. He said that the 13 brought to mind the algebra problem in an examination, which problem he did not know. The 23 reminded him that in his 23d year he became acquainted with his girl. The 13 again reminded him that in that year he was informed about sexuality.

Patient on several occasions talked about getting married and on mentioning the inadvisability of same he had petit mal seizures during which time he would speak Russian. He presented many wish fulfillment phantasies and bizarre ideas from time to time.

During a convulsive seizure it was observed that in the right eye there was hippus. The eye blinked and then there were convulsive movements of the right side of the face. He tried to talk but could only produce a blowing noise. The trunk stiffened and patient turned over in bed. The hand and arm on right side were thrown in convulsive movements. The patient then flexed and extended all the extremities except the left leg. There appeared a movement of the eyes resembling nystagmus. Foam, blood-tinged, appeared at the

mouth. The patient went into a deep sleep with stertorous breathing.

In summarizing the case it is rather significant that the mother had diabetes and that the family shows ample neurotic determinants to account for the inferiority of the patient. He showed an inferior speech mechanism very early and became a linguist according to the theory of Adler for no other reason than Demosthenes became an orator. His instability is shown by a failure in an examination in realschule and a scholarship for passing the highest entrance examination in the University of Chicago. The fact that he was over-devotional and knew nothing about sex until 13, at which age he began to masturbate and changed profoundly his religious views, is significant of an abnormal—a floundering sex development. The incident of his first convulsion is decidedly a psychic explosion to compensate for an otherwise inferior equipment to meet the emergency. The diagnosis of the disease after an attempted courtship branded him so far as society was concerned among the unmarrieds and thus caused him to react in a new and almost mysterious world so far as his own biological cravings were concerned. When he was said to have been suffering from tape-worm and hemorrhoids, it was most likely an anal erotic manifestation, and surgical intervention had no effect. We are led to believe that he was very devoted to his mother. What influence she had over him is not certain, but following her death a sort of compensatory mechanism in the form of hallucinations portraying his dead sweetheart's mother appeared. Another anal erotic defensive crisis occurred in his 5-day delirious episode when he passed no urine or feces. When the real motive of his cravings entered consciousness the incestuousness of them in the light of his religious and home training, on top of a biological inferiority, placed him in the category of the most despised—Satan. The quick recovery from this condition shows the adjustment of tensions. His free association is very active about incidents which aroused his aversion in previous years. There are many more things in the life of this patient which have interesting psychoanalytic interpretations.

The patient is biologically inferior, in the light of the vital force that creates progeny and progresses, rather than regresses. To psychoanalyze him is only to measure his biological decompensation, which is his particular psychosis. It happens that those who have behaved much like him have been called epileptics. Those who act a bit differently are given the name dementia praecox, manic depressives, etc.

Mr. A. meets a distasteful obstacle by cursing. This relieves certain tensions and strains and affords an outlet of energy to readjust the organism. Mr. B. is built differently, and in such a situation as Mr. A. has faced, he takes refuge in sudden unconsciousness—a sort of massive reflex—and lets the tensions readjust in the tonicities and clonicities which follow. Mr. C., with a totally different makeup, also takes refuge in unconsciousness, but slowly. His tensions are released slowly. He may end in a profound

stupor³⁵ and were he not built this way, he might have to resort to narcotics or alcohol to dissociate himself from the traumatizing situation.

SUMMARY

I. There are among epileptics more anatomical deviations than among normal people.

2. These are:

- (a) Simple morphological deviations.
- (b) Evidences of dyspituuitarism.

3. The changes in anatomical character are as much dependent upon the original anatomical character as a psychosis is upon the original mental make-up of an individual.

4. Physiologically there is in epileptics a profound change during and after convulsions.

5. Many of these changes remind one of infantile physiological phenomena.

6. The chemistry of certain foods, the vascular phenomena of epileptics and their endocrine disturbances suggest not a cause but sensitizing agents which tend to ignite the reaction of the organism whose threshold of mass reflex action is low.

7. Psychologically, epileptics show at certain times marked regressions, instability, restlessness, inadaptability and egocentricity, with lowered emotional tone.

8. They tend to regress in their sleep more than normal people as shown by their postures and dreams.

9. There are evidences that the regression is the psychological manifestation of infantilism which is latent or demonstrable anatomically.

10. Epilepsy is the particular way that a person has of behaving in the presence of real or imaginary situations. The individual is biologically inferior. He may compensate for some of this inferiority by unusual abilities. His inferiority, whether from pituitary disorder or other origin, nevertheless exists and concomitant with it are certain physiological conditions which represent the epitome of a tendency to act in a mass reflex.

II. On the assumption that epileptics are biologically inferior we should not throw up our hands as a fatalist would do, but strive by our studies in anatomy, physiology, chemistry, pharmacology, and psychology to meet them half way,—build what barriers we can around their weakest traits.

³⁵ Priests in India cultivate the ability to withdraw from reality in their method of devotion and from descriptions of them their condition must be very near to that of catatonic stupor.

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13. E. Stanley Abbot, M.D. A Case of Pure Psychic Epilepsy. (Reprinted from THE JOURNAL OF NERVOUS AND MENTAL DISEASE, Vol. 41, 7, 1914.)
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ST. ELIZABETH'S HOSPITAL,
WASHINGTON, D. C.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

THE THREE HUNDRED AND EIGHTY-EIGHTH REGULAR MEETING
HELD AT THE ACADEMY OF MEDICINE

APRIL 5, 1921

The President, DR. FOSTER KENNEDY, in the Chair

PRESENTATION OF A CASE OF POLYCYTHEMIA WITH NERVOUS SYMPTOMS

DR. MOSES KESCHNER outlined the characteristic features of polycythemia and presented a patient suffering from the disease. Polycythemia, or erythemia is a condition of the blood in which the number of red blood corpuscles is increased above the normal average of 5,000,000 per c. mm. It may occur in normal persons as a result of physiological stimuli or in disease as a result of pathological stimuli. It may be relative, *i.e.*, without real overproduction of red cells. In absolute or true polycythemia the total number of red cells in the body is actually increased. The true form is a disease of unknown origin characterized by a persistent erythemia due, it is thought, to excessive erythroblastic activity of the bone marrow, or to a failure of destruction of the red blood corpuscles. Some also ascribe it to faulty internal secretions, especially of the adrenals. The nervous manifestations of polycythemia have hitherto received very little attention, in contrast to those of the anemias which have been extensively studied. The most common encountered symptoms are headache, dizziness, visual disturbances, paralyses (motor and sensory), pain, muscular twitchings, convulsions, speech disorders, mental, vasomotor and trophic disturbances. There is general or localized pain, a vague aching and feeling of fullness and throbbing over the entire body, especially the head. Mentally some of the patients show defects of memory, and general symptoms of neurasthenia; they are emotionally unstable and have a tendency to become easily depressed or excited and at times delirious. Insomnia is a common symptom. In the vasomotor sphere, hyperhidrosis is frequently found. Excessive salivation with nausea after swallowing the saliva and anorexia were the chief symptoms which brought the patient presented to seek medical advice.

Eye symptoms are common and frequently the first noted. Some patients complain of easily induced fatigue from the use of the eyes.

Palsies of the external ocular muscles are quite common. These may give rise to diplopia. Scintillating scotomata, transient blindness, and hemianopsia are not infrequent. Ascher has described in this disease a form of asthenopia without refractive errors in which the patients give a history of repeated but unsuccessful efforts to get proper adjustments of glasses. The ophthalmoscope reveals changes in the fundi which are characteristic of the disease. The veins are distended and engorged so that they appear much larger and darker than the arteries; they are tortuous and may show varicosities. The disk may be normal, or slightly reddened, or it may have the appearance of a mild form of optic neuritis.

The nervous symptoms in the anemias are due to degeneration of the neurones brought about by toxemia. The pathological bases of the nervous symptoms in polycythemia are vascular. They may be thrombotic or hemorrhagic, and cause softening which is not due to arteriosclerosis.

The patient, a thirty year old Russian tailor was admitted to the Mt. Sinai Hospital complaining of headache and salivation from which he had been suffering for the last eight years. The salivation as well as the headache is almost constant. A summary of the symptoms shows attacks of tonsillitis in the past, headache, salivation, dizziness, vertigo, blurred vision, anorexia, hemorrhoids, congestion of face and eyes, insomnia, uncontrollable hemorrhage after tonsillectomy, flushes of heat and cold, tinnitus, epileptiform seizures. Blood examination showed Hb. 170 per cent. (Kuttner); 9,800,000 red blood corpuscles; 340,000 blood platelets; and 8000 white blood corpuscles. The red cells are microcytes and show some slight central pallor. A later examination showed Hb. 170 per cent. (Kuttner); 11,456,000 r. b. c.; 410,000 blood platelets; and 7,600 white blood corpuscles. The color of the blood stream in the veins of both disks was reported to be dark purple; much darker than normal. The arteries were normal. No other fundus changes were seen and the visual fields were normal. The patient was treated with atropin until there was marked dryness of throat and dilatation of the pupil, but the salivation did not diminish, nor did local astringents applied to the mouth have any effect on it. After the withdrawal of ten ounces of blood from the median basilic vein, the patient stated that his headache and dizziness were slightly relieved.

DR. B. SACHS asked concerning the patient's subjective state. Dr. Keschner resummarized the chief symptoms. The patient, when asked if he felt dizzy or sleepy replied in the affirmative. Dr. Sachs asked how the disease could be recognized.

DR. KESCHNER said that it was recognized in this patient by salivation, the headaches, attacks of dizziness, and epileptiform seizures. It was first suspected in trying the Wassermann test, when great difficulty was experienced in drawing blood from the vein. There was no evidence of other nervous disturbances. The appearance of the veins in the disks and the headache were the main factors. Dr. Keschner's theory was that the salivation was central.

It was not affected by the atropin. The saliva had not been examined.

DR. DANA said that a diagnosis of polycythemia could not be made from any nervous symptom.

DR. J. H. LEINER said that in the last six months he had seen two cases of this disease in which there were no nervous manifestations at all. An increase in blood cells was present. The throat was curiously stippled like a scarlet fever throat. There was black pigmentation along the mucosa, a characteristic congested eye, and a cyanotic flush of the face. A woman, fifty-five years of age, who had polycythemia vera, showed a high blood pressure. He had seen other cases that he planned to present before the Section on Skin Diseases, in which there had been no nervous manifestations. Some of the skin conditions he thought were endocrine in origin.

DR. ROSENTHAL (by invitation) said that a different type of polycythemia was present with the high blood pressure. It was described a long time ago by Geissler and was called polycythemia hypertonica. Here the blood pressure and pigmentation were not so marked. In these cases tuberculosis must always be ruled out, since polycythemia might be secondary to it.

DR. KESCHNER concluded the discussion by referring to the usual conception of erythroblastic overactivity of the bone marrow as well as the reduction in the normal destruction of the red cells as the cause for the condition. It had been treated by x-ray exposure of the spleen and of all of the long bones, with improvement. Some writers also report encouraging results from this treatment, while others say that some of these cases get better without treatment, and that the improvement simply represents a spontaneous remission. The injection of adrenalin causes an increase in the red blood cells. The condition is by some thought to be due to an adrenalemia.

COMBINED NEUROLOGICAL PERCUSSION HAMMER

DR. J. H. LEINER demonstrated a combined neurological percussion hammer having the advantages of being compact; of half the size of the ordinary hammer when closed, a little shorter when open. The design is that of the Roman battle axe; the balance is very delicately adjusted, and it is weighted by metal and a strip of soft cushion rubber to prevent trauma. The back had originally been made of a soft piece of rubber. It is now replaced by a harder piece set in by a set screw. The original hammer also turned from side to side and swerved. In this model, therefore, a groove has been cut in the bottom of the shank with a pin running through it. At the other end of the hammer there are three tubes to contain the instruments commonly used. These are a needle, very sharp, which can be pushed out by a little button, and set in fine German musical steel; a colored orange stick to test color vision which snaps back when not in use; and a camel's hair brush for touch experiments. This

hammer obviates the necessity of always carrying pins with one. It can be used for making the Babinski test as a tongue depressor; and it also makes cotton wool unnecessary. A limited number of these hammers have been made. There are 150 now available at a cost of \$7.50 each. When more are manufactured the cost will diminish. They are made by N. A. Low and Co., New York.

DR. SACHS said that he had been using this instrument for the past weeks and had found it the greatest help.

A CONTRIBUTION TO THE HISTOPATHOLOGY OF PORENCEPHALUS

DR. J. H. GLOBUS emphasized the close relationship of the defects met with in porencephalus and the inflammatory encephalitides. The striking disproportion existing between the unusually great loss of brain substance and the relatively mild degree of functional disturbances has always been of interest to the neurologist and neuropathologist. Hitherto gross anatomical observations have been made to the almost complete exclusion of investigation of the minute pathological changes.

The term porencephalus was first adopted by Heschl in 1859 to designate such defects in brain substance as are characterized by cavity formation in the cerebral hemispheres. Heschl assumed that this loss of brain substance should be attributed to faulty development owing to injury during the intrauterine life to the anlage of certain parts of the brain cortex. His conclusions were based on gross anatomical studies. In a later publication he admitted that a porencephalic defect might be due to a retrogressive, destructive process in the brain tissues occasioned by occlusion of cerebral blood vessels. In 1882 Kundrat reexamined all of Heschl's specimens and added about twelve brains from his own collection. His observations, based on gross anatomical studies, also led him to conclude that most of the porencephalic defects are congenital, although infrequently they may be acquired during extrauterine life. Hemorrhage, thrombosis, embolism, violent uterine contractions, hydrocephalus, anemia and psychic disturbances occurring to the mother during the period of pregnancy were factors in their production. The porencephalic loss of tissue may often be so pronounced that the individual dies early, yet in some instances the destruction if it does not involve vital centers permits the individual to mature, although physical and sometimes mental deficiency becomes increasingly apparent in the course of development. Relative hypertrophy of the opposite hemisphere is the compensation for destruction or atrophy of part of a hemisphere.

While Heschl limited the term porencephalus to excavations communicating either with the subarachnoid or ventricular spaces, Kundrat sought to widen the term so as to admit to the group other cerebral malformations, which, although not of typical cavity formation, were nevertheless characterized by extensive loss of brain substance and other pathological features similar to those encount-

ered in the typical form of porencephalus. Shultze made the next step in suggesting that porencephalus might be the residuum of an infectious encephalitic process occurring in the infancy of the individual. He denied Kundrat's theory of an anemic encephalitis and concluded from histopathological studies that inflammatory changes occur, and thought the loss of brain substance was due to an encephalitic process infectious in origin. The destructive changes began during the intrauterine life, he believed. Virchow definitely established the existence of congenital encephalitis as the result of infection transmitted by the mother if the latter is attacked during pregnancy by an infectious disease, exanthematous or luetic in character. Strümpell studied acute encephalitis in the infant and concluded that many porencephalic defects begin as early encephalitic processes which lead to scar formation in the cerebral cortex in the same way as is commonly seen in a cord affected by anterior poliomyelitis. In a discussion of the condition, finally Sachs and Peterson point out the difficulty in determining the origin of porencephalus. They do not find anatomical proof of the polioencephalitis of Strümpell, although conceding that some of the many cases of atrophy or sclerosis may have been due to polioencephalitis. Autopsies however have shown other conditions to have been present but not encephalitis. Dr. Globus felt, however, that in spite of the doubt thrown on the inflammatory origin of porencephalus, the presence of recent and chronic lesions coexisting with extensive atrophy and a large porencephalic defect in the case which he proceeded to describe, served as proof for the encephalitic origin of porencephalus.

The patient, eleven months of age, a first child, luetic history denied although the mother had been treated for an inflammatory condition of the cervix prior to and early in pregnancy, grew and developed normally up to the age of four months. Thereafter mental development ceased. There was no physical maldevelopment aside from apparent lack of growth of the head. The child was admitted to Mt. Sinai Hospital on account of the retardation in mental development; diagnosis of congenital microcephalus was made and bilateral subtemporal decompression advised. Physical examination showed the upper extremities spastic and in flexure contracture, and the lower extremities spastic. All deep reflexes exaggerated. The temperature was irregular ranging from 99.5° to 102°. After the operation there was no change in the patient's condition. Cerebrospinal fluid was noted escaping from the surgical wound. Eight days later several attacks of generalized convulsions developed with only slight neck rigidity. The child then grew progressively worse and died. Autopsy showed striking pathological findings limited to the brain and its meninges. The former was small and out of proportion to the size of the skull, apparently somewhat collapsed due to postoperative escape of cerebrospinal fluid. The meninges over the dorsolateral surfaces of the cerebral hemispheres were thickened in some areas and firmly adherent to the

underlying cortex while in other areas they were exceedingly distended by fluid. The right hemisphere showed particularly markedly atrophied parietooccipital lobes. Here the normal markings of the brain cortex were entirely lost and a stippled, corrugated, granulated surface appeared without trace of gyri or sulci. The vessels were freely movable over the surface. The cortex of the occipitofrontal lobe was extremely thin, particularly over the occipital pole. The left hemisphere showed marked symmetry compared to the right. The frontal lobe showed no first or second frontal convolution, these having been replaced by a granular stippled surface covered in places by thickened meninges. The parietooccipital lobes were similar in appearance to those on the opposite side. The orbital surface of the frontal lobe showed normal orbital fissures and gyri. The ventricles were markedly distended in all their division and with the exception of the frontal lobes left nothing but a shell of the cerebral hemisphere.

Microscopic examination of the changes in the pia arachnoid pointing to a more or less recent inflammatory process are characterized by the presence of macrophages with or without enclosures and with or without vacuolated cytoplasm; endothelial cells grouped in fairly large numbers about blood vessels constituting an important feature in the cellular infiltration. Small lymphocytes were also present in fairly large numbers. Fibroblasts giving off delicate processes, form a delicate network in places. The blood vessels are much dilated, congested, and display thickening of the adventitia. In the parietooccipital lobes the transition from the subacute inflammatory process in the meninges over the frontal lobes to the chronic fibrous thickening over the parietooccipital is strikingly abrupt. The majority of cortical vessels are apparently cut off by the meningeal cicatrization; others are strangulated at a point just below their entrance into the cortex by glial changes and in their course deeper in the substance of the cerebral hemispheres are empty or often obliterated and converted into a narrow band of connective tissue. Strangulation and obliteration of blood vessels lead to sclerotic changes in the cortical and subcortical substance which they supply. These zones of sclerosis are well delimited in correspondence to the areas supplied by the vessels now obliterated at a point of entrance into the cortex. A transition condition between the types of meningeal alterations seen is found in the leptomeninges over the temporal lobe. A well defined increase in fibrous elements with a moderate amount of mononuclear cell infiltration is found. There is fusion of the cerebral cortex with the pia arachnoid alongside of closed or partially closed vessels, brought about by an unusual process of migration of glial elements in the pia arachnoid. Individual glial cells can be seen migrating into the pia arachnoid and larger groups of glial cells are noted streaming into the pia arachnoid membrane alongside of a partially obliterated blood cell. This reaction of glial cells to anemic conditions resulting from obliteration of blood vessels is thus clearly demonstrated and

is in accord with the opinion that glial elements usually react by proliferation to circulatory disturbances in the central nervous system. The active streaming of ectodermal elements into the pia arachnoid, fusing with a tissue derived from an entirely different germinal layer is unusual.

The findings in the leptomeninges in this case make it apparent that the inflammatory process was primary there where it presents the more chronic features noted in the coverings of the parietooccipital lobes. The inflammatory process next involved the temporal lobe and finally the frontal lobes became the seat of the more recent inflammatory reaction. The various areas of the cerebral cortex presented lesions which in degree and character corresponded to the chronicity and character of the disease in the meninges. Slides of sections of the portions of the brain illustrating the striking and characteristic changes were shown together with sketches of the vessels surrounded by zones of gliosis and types of cells found.

The observations led Dr. Globus to conclude that an encephalitic process had taken place early in the life of the infant. The extensive destruction and atrophy of the cerebral cortex and the fact that the child during its eleven months of life had no illness force the conclusion that the destructive process in the brain substance and the resulting porencephalic defect must have been begun in the later part of the intrauterine period and remained active and slowly progressive during the child's life. The fact that the physical development of the child was practically uninfluenced by the loss of brain structure is best explained by the assumption that early in the disease the basal ganglia, midbrain, pons and medulla were not involved so that the child was able to carry on a purely vegetative existence like that of a decerebrate animal.

DR. SACHS expressed his great interest in the paper and felt that this work corroborated a suspicion which he had expressed some thirty years before. It still remains a question whether all cases can be explained by such defects. The occlusion of one of the branches of the larger arteries is not unknown. He asked whether Dr. Globus had sufficient evidence to show that the porencephalic defect occurred during the prenatal period or whether it could have been developed after birth.

DR. FOSTER KENNEDY said that only a few days ago he had seen a child with a definite nuclear aplasia, of the right seventh and hypoplasia of the right sixth nerves. The mother had been desperately ill with influenza at six months' pregnancy. At the time he had thought that the failure to develop was due to encephalitis in the fetus.

DR. GLOBUS in answer to Dr. Sachs's question again stated that there was absolutely no history of illness in the post natal life of the child. The mother had had an inflammatory condition early in pregnancy and before conception. Lesions both chronic and subacute had been found which therefore must have taken a long period to develop. The disease must be placed in the later part of

intrauterine life or in early childhood. The child had not been sick at all in extrauterine life, leaving the intrauterine period as the only alternative.

SOME FEATURES IN THE NEUROPSYCHIATRIC WORK ON ELLIS ISLAND

DR. B. ONUF, speaking on this subject, said that this was the first time that the question of immigration had been brought before the Society. The aim of Ellis Island was to control admissions to the United States, to exclude undesirables and restrict the entry of those who might become public charges. The question of undesirability, from the medical aspect, involved personal shortcomings and disabilities, transferable diseases, and hereditary factors. Laws were accordingly formulated. Those especially pertaining to medical conditions called for the absolute exclusion by a Board of Special Inquiry of idiots, imbeciles, feeble-minded, epileptic and insane, constitutional psychopathic inferiors, and chronic alcoholics. The mentality of physical defectives required certification. The law of exclusion held without appeal for all classes of defectives except the physical, upon which a board of special inquiry passes. The individual may again appeal from the decision of this board in which case the question is passed on to the Secretary of Labor who may grant admission under bond.

The medical part of the work at Ellis Island consists in recognizing the types of undesirables. The general procedure in making the necessary examinations and tests is as follows: The immigrants pass before the examiners and medical inspectors in line. At the head of the line stands a physician examining the eyes of every individual to make sure that no cases of trachoma pass. From the survey of the individuals as they pass, a rough general examination is completed, and individuals presenting any abnormality are marked with chalk, the letters to designate the part affected such as eyes, lame, hernia, etc. The patient marked is further examined and investigations sometimes give interesting results. The patient marked L for lame for example may show spastic paraplegia, or locomotor ataxia, or hemiplegia, or a progressive muscular dystrophy, a multiple neuritis, etc. Thus the examination of the disturbance of gait may reveal a variety of neurological as well as other conditions, such as a dislocation of the hip, flat feet, etc. The examiner is called upon to differentiate between countless causes. It is also a usual practice in making the routine examination to speak a word or so to each individual and thus elicit a reply and investigate the speech in this way. The general appearance is also diagnostic in many cases, and a diseased condition such as acromegaly, myxedema, or eunuchoidism may first be detected by this alone. A total examination gives further information in regard to muscular atrophies, etc. It is then the duty of the medical officer to certify the neuropsychiatric conditions found. Sometimes the

examiners differ. In cases of doubtful diagnosis the individual is usually certified as organic disease of the central nervous system.

The difficult of arriving at a diagnosis is great. In the hospital it is to the patient's interest to give a thorough history. The immigrant often will not give any information or if he does it is intended to delude. The diagnosis must be made from the patient as seen and from the questions that he will answer. The same difficulty is met with in examining mental defectives and psychotic patients. Here the Binet Simon test methods cannot be relied upon because of the variety of standards and environment represented by these aliens. For instance, some immigrants have never seen electric light, they have no knowledge of dates, the number of months in the year, the days of the week, etc. The conditions imposed by foreign languages are also exceedingly difficult. Interpreters miss the points of interest and value to physicians. In a psychotic case, for example, the physician wants to know just exactly what the patient says. The interpreter tries to make sense out of it and thus slurs the abnormalities in the current of thought.

Where a conclusion cannot be reached immediately the alien is sent to the hospital for observation. Ellis Island has a general hospital, a hospital for contagious disease, and a psychopathic ward. Detention is the usual rule. The service in the hospital has undergone great development in the last ten years. Thirty years ago there were no observation facilities. Now there is complete equipment and laboratories. In many cases such as trachoma, mental deficiencies due to hypothyroidism or atthyroidism and other conditions arising from disturbances of internal secretion of one gland or the other, a diagnosis is not made until the result of treatment is seen. In other cases the diagnosis is not made until confirmed by bacteriological examination as in leprosy, favus, ringworm, etc. Weekly conferences are held at which all interesting cases are presented and discussed, outside consultants come to lecture, etc.

DR. H. V. WILDMAN, JR., said that with the great influx of peoples from Southern and Eastern Europe the problem of keeping out those with mental defects was becoming one of the greatest importance. The detection of feebleminded immigrants is a separate and distinct specialty. Suggestions have been made that the Army B test be applied to arriving aliens but experimental work with group tests in general and the B tests in particular have not given good results. The largest number of mentally defective aliens have been detected by a short personal interview with the individual alien during the line inspection.

A discouraging feature of the work at present is the fact that many cases mandatorially excludable, are landed for various periods of time at the discretion of the Secretary of Labor. Lack of proper supervision allows some of these cases to land permanently in the country through various contingencies.

DR. I. J. SANDS said that many of the immigrants who became ill might later be found in Bellevue. That many of these who were

admitted to the observation wards echoed many of the horrors that had been occasioned by the late war. Thus a Russian developed a psychosis while on the steamer on getting white bread to eat; he had been living on straw for several months and the sight of real bread caused him to react in a manic depressive reaction. Another case was that of a Russian Jewish girl who had thrown her brother's children from a window. She was in a state of depression when she came to this country, and after six months a manic state developed. Her original depression was undoubtedly occasioned by the hardships encountered abroad and by the difficulties met while traveling through Russia and Poland. Dr. Sands thought that those cases that might later suffer from a neuropsychiatric condition to the extent of making them public charges, could hardly be detected by means of the ordinary so-called line examination. Cases of multiple sclerosis, paresis, etc., would hardly reach the boat; while cases of high grade mental deficiency, manic depressive psychosis in the mild and early stages, and simple precoxes, might easily escape detection. With an increase in the number of examining physicians, and the assignment of those men who have a knowledge of several of the foreign languages to Ellis Island, the number of undesirable aliens admitted would be materially reduced.

DR. WILDMAN said that the percentage of mental defect picked up at Ellis Island was three times that of the feeble-minded in institutions of the State of New York. Certificates of mental defects are issued only in cases about which there is no doubt.

In regard to the psychoses, the country is protected by the provision of the law which provides for deportation of aliens who become insane within five years of their landing. A similar provision for cases of mental defects detected within five years after landing would seem an additional and desirable safeguard if it could be incorporated in the next immigration law.

DR. ONUF in closing the discussion admitted that the examination could be made more thorough if the examining board had more men. The force is sometimes inadequate. When immigration is in greater numbers fewer certifications are issued since the examiners have not time enough. Yet in spite of the rush a good number of psychoses are certified.

Current Literature

I. VISCERAL NEUROLOGY

4. ENDOCRINOPATHIES.

Stocker, A. ON A CASE OF ACUTE MANIA CURED BY THYROIDECTOMY. [Revue Neurologique, No. 8, August, 1919.]

The case was that of a young girl 18 years of age. From the somatic viewpoint the following was noted: indications of Basedow's disease (exophthalmia, hypertrophied thyroid body) and absence of menstrual difficulties. The patient was in general well proportioned.

From the psychic point of view she showed acute maniacal excitement, of the clear typical form, which caused her detention.

After staying in hospital for about a month and a half she underwent a hemithyroidectomy. Her psychic state had continued the same. After the operation the agitation ceased; she kept quiet, her condition had clearly ameliorated. Some ten days later she came back to the hospital cured.

The excised gland showed changes recalling those of the Basedow thyroid: tall cells, festooned follicles, diffuent colloid. There was very rich capillary vascularization.

The clinical picture interspersed with thyroidal symptoms, the therapeutic outcome, and the results obtained from histopathologic examination combine to form the basis of the thyreogenic theory of affective psychoses set forth by Professor Parhon.

It seems that in this case the absence of ovarian difficulties, etc., favored the success of the intervention. The more advanced the case the greater the need for the intervention, since a diseased thyroid secretion would not fail to produce pluriglandular troubles. [Author's abstract.]

Roorda Smit, J. H. SYPHILIS OF THE THYROID GLAND. [Nederl. Tijdschr. voor Geneeskunde, 1921, LXV, 41, 156.]

The writer records two cases of syphilis of the thyroid gland in women, aged respectively 34 and 52. In addition to the triad of the symptoms of Graves's disease, both patients showed excentric hypertrophy of the heart, a psychosis of querulant persecution type, obstinate sleeplessness, anorexia and dyspepsia, emaciation, and large inactive pupils. The younger woman had had a goiter since the age of ten years; her acute toxic symptoms began eight months ago; she has all four incisor teeth of the type of congenital lues described by Borneville and

Sollier. Treatment by anti-thyroidal serum and by iodine and bromine preparations had failed. She responded extraordinarily quickly to a mercurial and arsenical treatment; her psychosis and insomnia gave way in five days. The woman of 52 had, in addition to the signs of exophthalmic goiter, plus reflexes and greatly diminished motor power in her limbs, cataract in both eyes, bilateral optic neuritis, central deafness of right ear, increased blood pressure. After five days of the mercury-arsenical treatment her psychosis and insomnia yielded. After 110 days of this treatment her goiter disappeared, her pulse came down from an irregular one of 140 to a more regular one of about 70, and her hearing returned in her affected ear. The writer concludes that the striking result in these two cases shows that lues must be admitted as one of the causes of the Graves-Basedow disease. [Leonard J. Kidd, London, England.]

Leriche, R. PERITHYROID SYMPATHECTOMY. [Lyon Chirurgial, January-February, 1920.]

With the view to isolate the thyroid from its vegetative nerve supply, in order to influence a parenchymatous goiter in a young adult who had had it since infancy, this operator resected the sheath of the superior thyroid artery from the cervical sympathetic to the thyroid. The artery underwent retrograde change and also the external carotid. The connected lobe of the thyroid seemed to be congested primarily, but then it began to atrophy rapidly. After thirty days there was little left. But the enlarged lobe of the other side had not altered. The results in this unilateral sympathectomy justify further intervention of the kind to modify goiters is the author's general conclusion.

Loeb, L., and Hesselberg, C. COMPENSATORY HYPERTROPHY OF THYROID. [Jl. Med. Research, January, 1920.]

The authors here discuss hypertrophy of the thyroid chiefly in their response to homoiotoxins, rather than compensatory hypertrophy as a part of a physiological or pathological process to relieve an endocrine inferiority in another part of the constitutional endocrine balance.

Labbé, M. DIABETES AND HYPERTHYROIDISM. [Ann. de Méd., 1920, 7, No. 2.]

Hyperglycemia and glycosuria are frequently related to hyperthyroid function and the author here reports upon five cases where this relationship appears. He further presents some animal experiments in which it appears that thyroid treatment reduced the capacity for sugar combustion, other times it increased it; in others thyroidectomy had a similarly variable effect. The hyperthyroidism exaggerates the nitrogen metabolism, and this explains the special tendency to acidosis. Iodine

seemed to have a favorable action on the palpitations, tachycardia and glycosuria. The sugar in the urine dropped from 208 to 71 gm. in a month in one case under iodine, while the general health improved. The data presented confirm the assumption that the thyroid hormone balances in some unknown ways the pancreatic hormone.

Strauss, L. DIABETES INSIPIDUS AND MYXEDEMA. [Deut. med. Woch., August 19, 1920.]

A boy of nine is here reported upon. The volume of urine amounted to 7 liters. The boy was very emaciated and was thirsty all of the time. He remained mentally alert, however. At eleven the quantity of urine and the extreme thirst gradually abated, but he became mentally inactive and began to fall behind in his studies at school. He became fat, stopped growing, was often drowsy and would fall asleep over his work. At the age of fifteen myxedema was typical, whereas the volume of urine had become normal. He was given thyroid. His drowsiness disappeared, his appearance became normal, he began again to grow and was able to fill an office position satisfactorily. He died at the age of twenty from pneumonia.

Kepinow. THE VASODYNAMIC ACTION OF PITUITRIN. [Compt. rend. Soc. Biol., July 24, 1920.]

As a result of his investigations on the dynamic action of pituitrin in blood vessels to find out if the action of this substance on the vessels depends on some modification, in the sense of an increase, of the adrenal secretion, it seemed to him that to study the proper effect of pituitrin on the vessels the action of the adrenals ought to be cut out. This he did by ligating the afferent vessels of the two glands in curarized dogs. When the action of the adrenals was (partly) thus eliminated he found that the injection of pituitrin did not produce any increase of blood pressure. In some experiments in which forceps had temporarily been applied to the afferent vessels and the injection of pituitrin brought forth no response the removal of the forceps was followed by increase of the blood pressure. These experiments show that there is a functional interdependence between the vasoconstrictive action of pituitrin and the intact functioning of the adrenals.

Coulaud, E. THYROID AND PITUITARY ORGANOTHERAPY. [Bull. Méd., September 25, 1920. J. A. M. A.]

Coulaud says that although benefit from thyroid treatment is constant in myxedema, the benefit is inconstant but occasionally excellent in eczema, ichthyosis, asthma and migraine, and alone or plus ovarian treatment in scleroderma, and that there is one form of chronic rheumatism in which a thyroid origin seems probable on account of the benefit under thyroid treatment. It may also prove effectual when there

are signs of hypothyroidism in pemphigus, chronic urticaria or trophe-
dema, psoriasis, alopecia, hay fever, constipation, rachitis and chronic
nephritis, and even when deficient thyroid functioning alternates with
exaggerated functioning. He says that as a rule goiters regress
under thyroid treatment, but at the same time severe symptoms develop
with cachexia. Even greater caution is required with exophthalmic
goiter. But notwithstanding the mishaps sometimes observed, there
have been cases displaying such distinct improvement as to justify the
use of thyroid treatment under careful surveillance, especially of the
cardiovascular system. This should avert all danger. He denounces it
for the tuberculous, saying that he has witnessed flarings up of the dis-
ease coinciding with resumption of thyroid treatment. In concluding
his remarks on pituitary treatment, Coulaud states that the suprarenals
were found considerably hypertrophied in animals that had been given
pituitary treatment for some time. He regards this as suggesting the
necessity for this treatment in all cases of asthenia of suprarenal origin
and in Addison's disease. The great contraindications for pituitary
treatment are arteriosclerosis and nephritis. The results of pituitary
treatment on nutrition, physical development and coagulation of the
blood have been vague and inconstant to date. Probably the symptoms
which we have been ascribing to the pituitary are in reality the result
merely of compression of neighboring organs by the pituitary tumor.
Even at its best, a pulverized glandular organ is not the product of the
secretion of that organ, and we cannot expect that it will take the place
completely of the latter.

Romeis, B. STEINACH'S ATTEMPTS AT REJUVENATION. [Münch. med.
Wochenschrift, August 27, 1920.]

The great optimism aroused by Steinach's operation is bound to be
overdone according to this author. The sexual glands, though they may
possess extraordinary importance in the animal organism, are, after all,
only a part of the whole, just as is the case with the other organs of
internal secretion.

Bauer, A. TESTICLE AND OVARY ORGANOTHERAPY. [Bull. Méd., Octo-
ber 2, 1920. J. A. M. A.]

Bauer says of testicle organotherapy that the results obtained in chil-
dren seem to indicate that it has a tonic and stimulating influence,
especially at puberty to combat "growing pains" near joints and to com-
bat the anemia and weakness common at this time. He regards it as
indicated also in cases of infantilism, particularly when the functioning
of the interstitial gland or of several glands seems to be at fault.
Ovarian treatment has a much wider field, and he cites statistics from
the literature showing its favorable action in the natural or artificial
menopause, in the vomiting of pregnancy, in amenorrhoea and dysmenor-

rhea, in obesity, chronic rheumatism, overactivity of the thyroid, and metritis. The benefit from ovarian treatment is restricted to the cases in which malfunction of the ovaries is evidently a factor, but Jayle, Jacobs, Spillmann and others have reported a large proportion of success and Charrin's experimental research has confirmed the restoration to normal of the oxidations and of the reactions of the blood in gravid animals under ovarian treatment. Carnot suggests that ovarian treatment begun at once might ward off the obesity which so frequently follows castration, the menopause, etc. Ovarian treatment has to be kept up for weeks, often for months, until the endocrine balance has been restored.

Houshalter, P. GERODERMIA IN A CHILD. [*Revue Neurologique*, January, 1920.]

Reporting a child aged $3\frac{1}{2}$ years whose skin has the flaccid, lined appearance of the senile. The hair is not affected. The testicles are small and the intelligence, etc., normal for his age. Souques and J. B. Charcot reported a similar case in 1891 in a girl, aged 21 years, and several similar cases have been reported since in some of which the hair has been affected. It is suggested that in the pathogenesis of this syndrome the endocrine glands play the principal part, especially the suprarenal. In several cases there has been observed an excessive tendency to fatigue.

Giuliani, R. NEUTRALIZATION OF SEX BY SEROTHERAPY. [*Annali d'Igiene*, June, 1920.]

Giuliani presents evidence as to the feasibility of inducing practical castration, without operative measures, by merely treating with substances known to have a specific destructive action on the testicles or the ovaries. This biologic castration with cytolytins was tried with orchitolytic serum on rabbits, the serum obtained from goats periodically injected with solutions of the nucleoproteins from rabbit testicles in increasing doses. Five rabbits were treated with the serum, from 1 to 4 c.c. being injected at intervals of from three to eight days. Two of the rabbits died at once; one was killed in two weeks, by which time the testicles showed considerably atrophy, the seminiferous tubules containing granular detritus. The two other rabbits were killed after an interval of thirty or forty days, and the microscope showed profound changes in the parenchyma, the tubules scarcely recognizable; the whole testicle looked as if it had been emptied of its contents. [J. A. M. A.]

Castex, M. R., and Waldorp, C. P. ENDOCRINE DWARF GROWTH. [*Revista de la Assoc. Médica Argentina*, April, June, 1920.]

This is a richly illustrated and carefully detailed study of an endocrine dwarf of 25 years of age, who showed the signs of inherited

syphilis, multiple trophic endocrine anomalies of the bones and viscera, Raynaud's angina of the extremities, and a mental picture resembling a dementia præcox.

Payr, E. STEINACH'S REJUVENATION OPERATION. [Zentralblatt für Chirurgie, September 11, 1920. J. A. M. A.]

To certain portions of genital glands Steinach applies the term "puberty gland," which corresponds to Leydig's cells—the interstitial cells of the testis—and to the interstitial substance of the ovary (lutein cells). Through experimentation we have learned that the endosecretory portions, the "puberty gland," are much more resistant to outside harm than are the generative portions of the genital glands. By the successful transplantation of the endosecretory portions from one individual to another, important facts in regard to the secondary sexual characters have been learned. Here we have, then, the basis for Steinach's procedure. By stimulation of the endosecretory action of the puberty gland at the expense of the generative function it is his idea to bring about a rejuvenating process in older people by the resuscitation and renewal of the weakening secondary sexual characters. In his latest communication Steinach describes two types of intervention: (1) ligation of the vas deferens where it merges with the epididymis, and (2) ligation of the ductuli efferentes (coni vasculosi) between the head of the epididymis and the upper pole of the testis. The latter leaves the blood vessels supplying the testis unimpaired. Payr remarks that, owing to gonorrhœa or trauma adhesions are often present which render the second type of operation difficult. He gives what he would consider at present the contraindications for the Steinach operation: (1) well preserved power to produce spermatozoa; (2) need of special caution in excitable, depressed or mentally disturbed subjects; (3) enlargement of the prostate (prostatectomy, also a rejuvenating operation, being indicated instead); (4) other organic causes for premature old age, with marked changes in the heart, blood vessels, kidneys, pancreas, intestine, etc.; (5) occlusion of the vas deferens due to previous disease (gonorrhœa), and (6) gradual deterioration of the secondary sexual characters owing to chronic disease of a different nature; for example, dystrophia adiposo-genitalis. Steinach's operation might be regarded as indicated in the case of subjects with healthy internal organs who are growing prematurely old and who, at the same time, show evidence of loss of function by their impaired secondary sexual characters. In doubtful cases röntgen irradiation should be tried before surgical operation is decided on. Only by such precautions can the threatening dangers, which Payr describes in detail, be avoided.

Schröder, R. SIGNS OF ABNORMAL OVARIAN FUNCTIONING. [Monatschr. f. Geb. u. Gynak., April, 1920. J. A. M. A.]

Schröder says that constitutional factors may be responsible for excessive functioning of the ovaries, or the loss of inhibitory factors from other endocrine glands. Chronic metroendometritis may develop as the consequence of long continued ovarian hyperfunctioning, but transient hyperfunction is usually a period of increased physical, mental and sexual vigor. Secondary insufficiency of the ovaries may be traced to pelvic disease; to excessive or deficient functioning of the thyroid, suprarenals or pituitary; to cachexia of any kind; or acute and chronic intoxication of medicinal or parenteral nature from metabolic or nutritional disturbance; to anemias or chlorosis; to carbon dioxide intoxication from defective circulation; to nervous or mental derangement, possibly from abnormal distribution of the blood; or to unknown causes, as from change of climate. If all these can be excluded, primary insufficiency of the ovaries may be assumed, and proper treatment instituted. Perverted ovarian functioning is manifested in irregular bleeding from the uterus from the persistence of ripe follicles without any corpus luteum stage. With cystic degeneration of the ovaries, the follicles do not ripen, but with this hemorrhagic metropathy the persistence of the follicles keeps the endometrium in a constant state of proliferation. Another anomaly for which perverted ovarian secretion is known to be responsible is the persisting corpus luteum. It may be so large as to simulate extrauterine pregnancy.

Dederer, C. AMENORRHEA FOLLOWING MASTECTOMY. [Endocrinology, April-June, 1920.]

C. Dederer reports the history of a patient who suffered from amenorrhea for about fourteen years following the removal of parts of both breasts. Sectioning of the sympathetic nerves to the ovaries and resection of the adventitia of the ovarian vessels was followed by the re-establishment of menstruation.

Steinach. HISTOLOGY OF THE GONADS IN HOMOSEXUAL MEN. [Arch. f. Entwickelungsmech. der Organismen, Bd. 46, No. 1. Med. Rec.]

Steinach's name is much before the public in these days in connection with youthful regeneration by implantation of the gonads and commercial companies are said to have been organized to exploit this idea. This scientist, however, is primarily an embryologist who has produced hermaphrodites experimentally and who was the first to inspire the idea of testicular grafting as a cure for homosexuality. The original idea of the latter was that of a purely psychic alteration but Steinach has shown that the gonads of these men, although in most cases apparently fully developed, are histologically abnormal: certainly in all congenital cases, or in other words in true inversion. The field opened up is con-

siderable, for homosexuality masked during life may be revealed at autopsy and after castration. It has always seemed singular that inverts even when they copulate with women are almost always sterile. A few homosexuals have begotten children and from this viewpoint such are not true inverts but perverts. The histological alterations found by Steinach are naturally those of degenerative or atrophic character as far as the seminiferous structures are concerned, while in the interstitial portion large cells resembling the lutein cells of the ovary may be seen. The earliest experiments in grafting normal testicular tissue into homosexual men, presumably after castration, inspired by Steinach, are said to have been completely successful in transforming inverts into sexually normal men, but in the present review there is no mention of these results.

Briau, Lacassagne, and Lagoutte. BILATERAL HERMAPHRODITISM WITH BISEXUAL GLANDS. [*Gyn. et Obstét. Rev. Mens.*, Vol. 1, No. 2, 1920.]

This patient at birth was thought to be a girl. From the age of three months it was regarded as a boy with perineal hypospadias, and efforts were made to construct a penile urethra. When sixteen an operation for radical cure of a right inguinal hydrocele was performed, and the absence was noticed of the left testis from the scrotum. Soon afterwards there began to occur regularly every three weeks an admixture of blood with the urine; at these times no mammary changes occurred, although the breasts had distinctly feminine configuration. During the next two years pain and tenderness in association with the periodic hemorrhages continued to increase, and the patient sought further treatment. At laparotomy were found a rather small uterus; on the right, a round ligament, a rudimentary tube, and no ovary; on the left, a round ligament, a Fallopian tube and an inflamed enlarged "ovary" containing a blood cyst. Subtotal hysterectomy was performed, and the "testis" was removed from the right groin. The excised sexual glands were very carefully examined; that of each side was proved to be a mixed gland, containing both ovarian and testicular elements. The left gland, according to its pelvic situation, and its relation with the uterus and tube, was an ovary; microscopically it was shown to comprise two parts—a fully functioning ovarian part and a testicular portion with rudimentary spermatocytes. The right gland, by reason of its inguinal situation, its anterior covering of tunica vaginalis, and its connection with an epididymis and vas deferens, appeared to be an ectopic testis; microscopically it contained an ovarian portion with ripe follicles and a testicular part with fully formed spermatocytes. The patient has been free from nervous or circulatory troubles in the five years that have elapsed since the last operation. [B. M. J.]

Canelli, A. F. ANATOMY AND PATHOLOGY OF THYMUS IN YOUNG CHILDREN. [Pediatria, August 15, 1920. J. A. M. A.]

Canelli found the thymus in two lobes in 78.25 per cent. of the 115 cadavers examined. In 74.77 per cent. the thymus was in the thorax, and he advises never to disturb the sternum until the location of the thymus has been ascertained. The water content seemed to be in inverse proportion to the age, while the weight after desiccation increased with the age.

Canelli. THE THYMUS IN EARLY LIFE. [La Pediatria, August 15, 1920. B. M. J.]

From the study of the thymus in 41 infants, the following conclusions are reached by the author: (1) From the topographical point of view three groups of thymuses may be described, which in order of frequency are thoracic, thoraco-cervical, and cervical, the last being an ectopic thymus. (2) As regards lobulation, four groups of thymuses may be described—namely, bilobar, unilobar, trilobar, and multilobar; the great majority of enlarged thymuses are bilobar. (3) The color of the thymus is related to the state of general nutrition, to local and general disease, and to the post mortem condition. In premature infants the thymus is often congested and hemorrhagic, but it has yet to be shown whether this is due to prematurity or to coexistent asphyxia. (4) The relative weight of the thymus varies within fairly wide limits.

Dustin, A. THE THYMUS AS AN ENDOCRINE ORGAN. [Presse Médicale, June 5, 1920.]

The hitherto accredited theory that the small thymic cells are true lymphocytes and the Hassall bodies epithelial derivatives with an endocrine function can no longer be considered valid. The only really functioning cell is the small thymic cell, which resembles a lymphocyte but is actually derived by a strictly special process from the primordial epithelium of the thymus. The main function of the organ is division of these small cells by karyokinesis and disappearance of the cells by pyknosis, nuclein derivatives being set free in the system. This liberation of nuclein material by the thymus is strongly influenced, if not initiated, by the thyroid gland. The thymus thus acts as a regulator and disseminator of nucleins and their derivatives in the organism. Important applications of these facts may be made in morbid conditions of the thymus, lymphoid formations, tumors, and in the biochemical disturbances of nucleinic metabolism. The organ does not operate, as would a gland, through a secretion, but by fixation of substances of the nucleoprotein group in the condition of actual formed elements or cells.

De Quervain. ORGANOTHERAPY IN FROEHLICH'S SYNDROME. [Schw. med. Woch., July 15, 1920. Med. Rec.]

A boy of ten had hypophysis tumor. The left eye had become quite blind, with vision impaired in the right. There was headache and very large sella. Diabetes inspidus was marked. The appearance was typical of Froehlich's syndrome. Neither hypophysis nor thyroid tablets gave material relief. Surgical intervention after some years was apparently limited to decompression. The *status quo ante* returned with death under symptoms of compression. Autopsy revealed a calcified epithelioma of the duct with destruction of most of the hypophysis. The second patient was a girl of twelve who at the age of seven began to develop Froehlich's syndrome. At the period of complete evolution the child resembled a fat woman at the menopause. Hypophysis extract was begun, alternating the anterior and posterior lobes and tablets and fresh substance over a long period. The subject began to lose weight while she began to increase in height. The gain was over 12 cm. in one year as against 10 cm. in the preceding four years. Injury of the posterior lobe will cause fat deposit and that the same lobe also plays a rôle in skeletal growth.

Parhon, C. J., and Stocker, A. ON A CASE OF ACROMEGALOGIGANTISM WITH MANIC DEPRESSIVE PSYCHOSIS. [Revue Neurologique, No. 6, 1919.]

The authors first lay stress upon the facts that call for the intervention of the endocrine glands in the pathogeny of the psychoses and especially upon the part played in the manic depressive psychosis by disturbances of the thyroid. The disturbances are indicated by:

1. The presence of thyroid phenomena in the patients suffering from this psychosis. Goiter is frequently observed, exophthalmia and even tachycardia.
2. There is a resemblance in psychic state of these patients to that of Basedow cases.
3. There is coexistence of the manic depressive psychosis with Basedow's syndrome.
4. The mean weight of the thyroid in the psychosis in question is found to be at the upper limit of the maximum weight of the normal thyroid.
5. The frequency of occurrence of these two affections in women.
6. Their coincidence with hyperthyroidal epochs (puberty, menopause, etc.).
7. The hyperexcitability of the nervous system in the manic depressive psychoses which resembles that of experimental hyperthyroidism.
8. The therapeutic effect of thyroidectomy.

They then give an account of their observations on a patient who had acromegalogigantism (height 6 feet). This individual was twice in

hospital for difficulties of melancholic nature. He would sit in silence, head on his breast, motionless, with his hat in his hands, or if he did not have the hat, rubbing his hands constantly with an anxious and pained expression. He sighed frequently. He had ideas of humility, of culpability, "I am a poor wretch, there is a great sin weighing on my heart," etc. "I am a sacrilegious sinner, a poor wretch, I ought to die, I must get out of this world." He had obsessions. "Whenever I saw a decent woman I felt within me against my will a force which impelled me to say indecent things to her," etc. Although highly educated he showed a marked degree of mental puerilism: an "Almanac" seemed to him as worthy of quotation as classical works.

His sexual life preoccupied him very much; formerly an onanist he is abstinent at present. "He whips himself each day to escape carnal desires" and "in order to become a saint. To this end he began to read the biographies of penitents and . . . bought a horse whip as thick as his fist."

The writers think that in this case the psychic difficulties as well as the somatic disturbances are due to disorders of the functions of the endocrine glands, and as the main difficulty they indicate a drying up of the thyroid function. This gland has often been found hypertrophied and structurally modified in cases of gigantism or acromegaly. [Author's abstract.]

Reverchon. PITUITARY TUMOR. [Bull. de la Soc. Méd. des Hôp., July 23, 1920.]

Following a severe air concussion this soldier of 27 began to have lessened erotic inclinations. X ray examinations showed an enlarged sella turcica. X ray exposure to the presumably hypophyseal tumor, after six months, weekly treatments, seemed to cause an abatement in its growth and an arrest of the other symptoms.

Roberts, S. R. SIGNS AND SYMPTOMS OF HYPOPITUITARISM. [South. Med. J., March, 1920.]

The chief symptoms of hypopituitarism such as dwarfism, dysgenitalism, feminine skeleton, feminine hirsuties, and modifications of secondary characters, genital atrophy and impotence, languor, headache, weakness, may appear in varying degrees at different periods in different cases. Subnormal temperature, dry skin, adiposity, low blood pressure, slow pulse, constipation, amenorrhea, drowsiness, inactivity are among the more fundamental signs of minor types. Lack of attention, actual dullness, mild psychoses, impairment of memory to actual convulsive seizures with epileptic attacks may occur in others. The chief reasons may rest in a tumor, a hydrocephalus, pressure of a neighboring tumor, or impairment of the glandular structures themselves. Symptoms of intracranial tumor may be more prominent than those of

pituitary deficiency. Infantilism, dysgenitalism, obesity, symptoms of intracranial tumor, warrant pituitary study.

van Valkenburg, C. T. ADIPOSO-GENITAL ATROPHY. [*Nederland. Tijdschr. voor Geneeskunde*, 1920, March 20, p. 997.]

The writer reports to the Amsterdam Neurological Society a case of adiposo-genital atrophy in a boy who died when fourteen years old. He was admitted five times from 1914 to 1919; at first there were signs of meningitis alternating with a dazed, muzzy state, but no other signs. In 1917 he was somnolent for a month, and showed Argyll-Robertson pupils. Then he had a series of epileptic attacks. Soon after these had ceased, a partial hemiplegia appeared, during which a bilateral "frontal reflex"—described in 1915 by van Valkenburg—was present. He now had unequal pupils, reacting poorly to light, irregular defect of the visual fields, papillitis, and variable plantar responses. He had loss of memory for events occurring during the last three years, and very defective fixation; he was poorly oriented and confabulated. He was very fat, and his testes were too small. Urine, temperature, blood, and spinal fluid normal. His mood was cheerful, but for some days he was heavy and muzzy. Six months later he went into status epilepticus and died. The diagnosis was a chronic progressive encephalitis involving the floor of the third ventricle and the pituitary, and disturbing the latter's junction. Necropsy showed, in addition to the encephalitis, scattered small tubercles in the cerebellum and elsewhere, and a tuberculosis of the pia mater. The infundibular region, as well as the optic nerves and tracts, were much affected by the tuberculosis, as well as by the encephalitis and meningitis. There were present also tuberculous bronchial glands, thymus hyperplasia, normal thyroid and parathyroids, a small pancreas, fatty pigmented liver, adrenals poor in medulla, and testes atrophic, with very little interstitial tissue. Microscopically, the pituitary showed enlargement and dilatation of its greatly filled blood vessels, without any definite change in any of its various kinds of cells. The cerebral cortex was normal, apart from the extensive superficial changes and the presence of a few deeply situated tubercles. The writer points out the peculiarity of the clinical course, and the probable dependence of the disturbance of memory-fixation, as an isolated psychological change, on dysfunction of the pituitary. [Leonard J. Kidd, London, England.]

Hekman, J. A CASE OF PINEAL TUMOR. [*Nederland. Tijdschr. voor Geneeskunde*, 1920, May 22, 1891 (1 fig.).]

A case of pineal tumor has been shown by Hekman to the Rotterdam Clinical Society in a girl of fourteen. At three years of age she fell from a chair on her head, but was not unconscious afterwards. Later, the movements of her left limbs were defective and the limbs did not grow so well as on the right side; gait was difficult. Vision has been

very bad during the last four or five years. For three years she has become very fat, and has been subject to attacks, lasting an hour or two, in which her eyes turn to the right and she bites tongue and lips, breathes stertorously, and sometimes involuntarily micturates or defecates. Often she vomits after the attacks, and often complains of headache and giddiness. She began to menstruate at eleven. The attacks almost always occur before or during the periods. She is always very quick-witted, noisy, talks much, and is continually animated. She is fond of caressing and is very erotic. Parents and brothers and sisters healthy. She has a left hemiplegia with imperfect growth of left arm and double Babinski sign. She is almost blind in the right eye and the visual acuteness in the left is only 1/10. Pupils equal, large, react poorly to light, consensually and on convergence; slight nystagnus. Right optic disc porcelain-white, especially temporal side; also on left, with dilated retinal veins. No ocular palsies. Other sense organs normal. A radiogram shows no enlargement of the sella turcica. General adiposity and great development of breasts and pubic hair. In this case the hemiplegia is regarded either as due to an encephalitis or possibly to a hemorrhage in the right internal capsule due to the fall on her head. The diagnosis of pineal tumor rests on the eye disturbances and the sexual precocity and adiposity. The lesion is held to be a neoplasm—possibly a teratoma—on account of the steady increase of the signs, especially the ocular ones. [Leonard J. Kidd, London, England.]

II. SENSORI-MOTOR NEUROLOGY

2. SPINAL CORD.

Gatti, Lodovico. SYNERGIC SPINAL REFLEXES. [Riv. di patol., nerv., September 13, 1919.]

The author made his study because the records of static reflexes in man of mesencephalic origin were meager. For phasic reflex studies the spinal animal must be used, despite the fact that in decerebrate animals the extensor hypertonus overshadows the phasic flexor system. In spinal animals if a painful stimulus is applied to the hind legs prompt retraction in all their segments, the flexion reflex of Sherrington, will result. If mild stimuli are used rhythmical reflex phenomena are demonstrated. The rhythmic reflexes can also be produced by stimulating the cord itself electrically in the dog.

In man the synergic pathologic reflexes are called synergic reflexes rather than by interpretative names. In ordinary spastic paraplegias painful stimulus applied to the foot produces the flexion reflex of the spinal animal. This is best obtained by forced passive plantar flexion of the toes. Where this appears spontaneously, Babinski believes it is due to visceral stimulation. It has been known to occur during defecation, and Marinesco and Noica have seen it follow forced inspiration

and coughing. Normally the movement of retraction of the limb with plantar flexion of the toes occurs in response to painful stimuli in man. Babinski holds that this response to stimulation of any part of the limb except the plantar surface is pathologic if in addition to flexion of the limb, at all three segments, dorsiflexion of the big toe is obtained. The regularity with which this sign occurs has led Marie and Foix to say that the Babinski reflex is part of the flexion reflex, to which Babinski objects. Marie believes that the triple reflex retraction and the Babinski sign are automatic movements seen normally in the walking biped, the minimum response to plantar excitation. The author describes two cases in which the Babinski response coincide with a lengthening of the limb, giving an appearance of synergy between these two movements. Here it was not an extension reflex, since every stimulus increased the extensor spasm, and this spasticity opposed the usual reflex because the extensors contracted more strongly. The dorsiflexors became less dominant because in the extreme extension of the limb the points of their insertion were lengthened while the plantar flexors shortened theirs and made this movement mechanically easier. The author states that the Babinski is not the minimum motor response to plantar stimulation because by palpation the flexors of the leg were felt to contract more strongly in this test. That dorsiflexion of the toe is more evident is due to the fact that the extensor longus hallucis has only to move the big toe while the flexors of the leg have a larger task. The author believes that it is merely an expression of the reflex activity of the muscular group topographically the lowest in the flexor system, and cites a case in which a few days after injury the Babinski sign occurred alone and only on one side with mild contraction of the hamstrings. The paralysis of all the muscles except the extensor hallucis is difficult to explain, but apparently a general inhibition of all spinal motor apparatus existed with that exception.

The author believes that the flexion reflex has not the same physiological significance as the rhythmic reflex [running] because a single painful stimulus produces the first, mild or painful stimuli, however, being necessary to bring out the latter. Marie does not believe it to be a defense reflex, and the author disagrees with Marie and Foix's view that it is an expression of "spinal stepping." The author feels that the stimulus arriving at the anterior horn cells of the automatic spinal animal diffuses through various groups of cells an automatic synergic response which may be a habitual response to serve any one of several ends. There is no specificity of purpose, it is only a movement; the animal flexes his limb in walking and in withdrawing it from painful contact and the child in his first days does the same purposelessly. If the rhythmic reflexes are ambulatory responses, the closure reflexes defensive, the synergy between contraction of the bulbocavernosus and flexion of the legs is a sexual reflex; the retraction of the lower extremity rep-

resents, therefore, not an emotion but a phase in the completion of one, which may be the running reflex synergy or something else.

The cutaneous reflexes are analogous to the synergic and seem to be reflex movements adapted to defense. They are not cortical, for transverse lesions of the cord have been described with their retention, although the cortex inhibits them [Sherrington]. They are spinal and have a phylogenetic habitual significance. Onanov's sign, obtained by stimulating the skin of the scrotum or penis, causing contraction of the bulbo and ischio cavernosi in the perineum, and of the levator and sphincter ani, was looked for in all the author's cases. This reflex usually disappears with impotence due to old age, tabes, etc. It was found to persist in severely injured soldiers even when there was complete paraplegia with anesthesia and retention or incontinence, providing the prepuce and glans were sufficiently stimulated. Pressing downward on the clitoris in forty out of seventy women produced a contraction of the vulva [bulbo cavernosis] and of the sphincter and levator ani, with synergic bilateral contraction of the biceps, the latter occurring in men also, and indicate that the clitoris and penis are not only homologous structurally but have the same reflex nervous mechanism.

Babinski's flexion paraplegia is not an indication of mild pyramidal involvement, but is due to the frequent incitement of the flexion reflex, the lower extremities assuming this attitude as a result of contractures. At first, the author insists that in these patients with flexion paraplegia, another reason than the mechanical contractures is operative, for after the initial shock was over, these patients lying in passive extension [flaccid paralysis] soon changed to active spastic flexion. The paralysis is probably originally one in flexion, the later attitude being inhibited by the shock. All the author's patients with flexion paraplegia were seriously injured with complete motor and sensory loss. In these cases the ankle and patellars are diminished and the biceps and other flexors give active reflex responses. [Stragnell.]

van Valkenburg, C. T. KINESTHETIC PARESTHESIA AND A NEW HALLUX EXTENSOR REFLEX. [*Nederlandsch Tijdschr. voor Geneeskunde*, 1919, LXIII, H 2, 1115.]

The writer reports to the Amsterdam Neurological Society a case of kinesthetic paresthesia and a new extensor hallux reflex. A youth of eighteen, about four months after a fall on his head with signs of intestinal hemorrhage—which disappeared—complained of a feeling of powerlessness in his left arm. Examination showed some slight weakness in left arm and leg without definite hemiplegic signs, no objective sensory changes, and slight subjective sensory symptoms. Retinal blood vessels rather dilated, and pulse variable, usually about fifty. Strong pressure over the junction of the middle and lower thirds of the left tibia gave hallux extensor, but there were no Babinski nor Oppenheim

signs. A right Rolandic region epicerebral traumatic lesion was diagnosed. Trephining. Serous meningitis, much fluid. During recovery from this the peculiar hallux extensor reflex disappeared and was replaced by a flexor reflex. Probably the pyramidal path was disturbed, without actual involvement. Some days after operation kinesthetic paresthesia of the four fingers (piano playing movements) were observed on two occasions. [Leonard J. Kidd, London, England.]

Frazier, C. H. SECTION OF THE ANTEROLATERAL COLUMNS OF THE SPINAL CORD FOR THE RELIEF OF PAIN. [Am. Arch. of Neur. and Psych., August, 1920.]

Since Spiller in 1912 proposed section of the anterolateral columns of the cord to alleviate pain, the author has carried out this operation on six occasions, four times with complete and twice with partial relief. The types of cases operated upon were as follows: Inoperable sarcoma of the spine at level of second and third lumbar vertebra; gunshot wound of spine with intense pain in left lower extremity; carcinoma of rectum, pain in rectum buttock and thighs; inoperable sarcoma of thigh with pelvic metastasis and insufferable pain in gluteal region; gunshot wound of spine, pain in both lower extremities; and shell wound of pelvis with injury to the sciatic nerve. The technique of the operation involved the questions, at what level section of the anterolateral column should be made, and how much section should be made. The sixth thoracic segment was the site elected, while the width had as posterior boundary a point midway between anterior and posterior roots. The depth, determined with great difficulty, was prescribed as 2.5 mm. After exposure of the cord at the selected level it is rotated by grasping a denticulate ligament with mosquito forceps. The anterolateral area thus brought into view is sectioned by a special instrument, in which a blade with a curve 2.5 mm. in diameter is mounted on a carrier at an obtuse angle. The anterolateral column is encircled and a second sliding blade is advanced until the tissue intervening between the blades is severed. [Stragnell.]

Gordon, Alfred. UNILATERAL SCAPULOHUMERAL MYOPATHY. [Phila. Neur. Society Proceedings, December 17, 1910.]

Gordon presented the case of a middle-aged woman, who about five years ago began to suffer some inconvenience in her right shoulder. There was no pain at any time. She was able to work with her right arm, could elevate and rotate the arm, but there was a certain awkwardness in performing these acts. Gradually a weakness of the muscles surrounding the shoulder joint developed. The patient found it difficult to raise the arm and to shrug the shoulder. At no time was there any objective or subjective disturbance in the parts affected. During a period of five years the condition grew progressively worse. At present

the atrophy is pronounced at the shoulder girdle; the pectoralis major, supraclavicular muscles, supra and infraspinatus, the rhomboid, the serratus—all show considerable wasting. The scapula is displaced, its lower angle is elevated considerably. The muscles of the arm are fairly well preserved as seen from the power in functioning. The muscles of the forearm and especially the extensors, also the small muscles of the hand, are somewhat but distinctly atrophied. The patient has lost the power of elevating the arm and extending the wrist. The reflexes of the upper extremity—such as biceps, triceps, wrist reflexes, are all abolished. Moreover the supraclavicular musculature on the left side is beginning to be involved, also the calf muscles on the right are somewhat flabbier on the right than on the left. The knee jerks are normal and equal on both sides. Sensations are normal to all forms. Close inspection of the face shows a slightly greater fullness on the left than on the right, the left nasolabial fold is somewhat deeper than the right. The entire right side of the face seems smoother than the left. Fibrillary contractions, increased mechanical irritability and reactions of degeneration are all absent in the atrophied muscles. X ray examinations of the various articulations of the upper extremities have been negative. The case seems to be one of myopathy of the scapulohumeral variety with the possibility of Dejerine-Landouzy type. [Author's abstract.]

Barrie, J., and Schrapf, R. SYMPATHETIC DISTURBANCE (SENSORY, MOTOR AND VASOMOTOR) IN THE UPPER EXTREMITIES FROM INFECTIONS OF THE MID DORSAL AND LOWER DORSAL CORD. [*Revue Neurologique*, March, 1920.]

In three cases of injury to the dorsal region of the cord, in two of which there was a necropsy, the patient complained of sensations of numbness, tingling, stiffness or coldness in the last three fingers of the hand. The index and thumb usually escaped. There was no atrophy of the muscles of the hand. The reflexes were normal. The grip was a trifle weak. Generally these phenomena were bilateral. In one of these cases the injury was to the tenth dorsal segment, in another at the seventh dorsal segment and in a third from the tenth to the twelfth dorsal. The spinal cord above these levels was apparently normal. In two cases of Pott's disease, one with a lesion at the seventh dorsal segment and another with a lesion at the twelfth dorsal segment, similar phenomena were observed. Also in a case of serous meningitis, causing paraplegia, with the point of compression in the lower part of the cord, the same symptoms occurred. The author observed that these symptoms may precede a development of the paraplegic symptoms in cases of Pott's disease. According to Claude Bernard, the sympathetic nerves of the upper extremities are supplied from ganglia from the third to the seventh dorsal segments and Langley points out that these ganglia may have their spinal connections from the fourth to the tenth dorsal segments. The

above cases would lead one to think that the central connections of the sympathetic nervous system which go to supply the nerves of the upper extremities are from the sixth to the eleventh dorsal segments. The symptoms are of considerable clinical value because of the possibility that it might lead to error in localizing diagnosis. [Camp.]

Marinesco, G., and Radovici, A. A NEW SKIN REFLEX—THE PALMAR-CHIN REFLEX. [Revue Neurologique, March, 1920.]

The reflex is elicited by irritation of the palm, especially the thenar eminence, which causes a retraction of the chin on the same side and sometimes a series of folds corresponding to the insertion of the muscle. This reflex is fairly constant in normal individuals. It was present in 23 out of 31 normal subjects tested by the author. It is best taken with the patient reclining with the chin relaxed and the mouth slightly open. In cases of pyramidal tract involvement, the reflex is slower, more durable and of greater amplitude and may be obtained from other parts of the body than the palm. It is an indirect reflex, with an intercalated neurone, and is absent in tabes dorsalis, facial palsy, etc. [Camp.]

Hübner, A. A. SYMPTOMS FROM ANTIRABIES TREATMENT. [Deut. med. Woch., January 29, 1920. J. A. M. A.]

Hübner reports several cases in which physical and mental disturbances followed injection of antirabic serum. One man of 27 was bitten by a dog, and although there was no evidence of rabies, he received eighteen prophylactic injections of antirabic serum. The last day he received two injections, as he was leaving the city. On the journey home he felt formication in the right side of the face and six hours later right facial paralysis developed, and five days later, the same on the left side, with pains in the right ear. Opening the jaws was painful, and frontal and occipital headache was present and pain in the back at times, testifying to neuritis of the cerebral and certain peripheral nerves, with a certain amount of psychic disturbance. In three months he seemed to have quite recovered and had resumed work. Nothing else was known to explain the facial diplegia; rabies itself, Hübner thinks, can be definitely excluded in the case. In eight other cases he noted weakness and psychic changes after antirabies treatment. His experience thus warns that antirabies treatment is liable to temporarily incapacitate to some extent for regular work and responsibility.

Pari. HYPERHIDROSES IN MYELOPATHIES. [In Policlinica, Sez. Prat., August 16, 1920.]

Experiments on cats would tend to show that there may be a secretion of sweat below a spinal lesion, either temporarily following the trauma or for a longer period. Two mechanisms may give rise to hyperhidrosis in spinal cord lesions: (1) Direct irritation of the secretory

synapses in the cord; (2) hyperexcitability of these zones by thermal stimuli. Hitherto in the clinical study of myelopathies no account has been taken of the distinction between spontaneous sweating and hyperhidrosis due to a thermal stimulus. Experimental physiopathology has not yet explained why spinal lesions in some cases give rise to anhidrosis, and in others to hyperhidrosis, nor have clinical observations accounted for this difference. Clinically anhidrosis and hyperhidrosis appear to occur according to the nature of the morbid process, hyperhidrosis being more frequent in syringomyelia compared with other myelopathies.

4. MIDBRAIN AND CEREBELLUM.

Salomonson, W. A. Wertheim. A CASE OF RHYTHMICAL HYPERKINESIS. [Nederlandsch Tijdschr. voor Geneeskunde, 1920, LXIV, H 2, 2622.]

Salomonson reports to the Amsterdam Neurological Society a case of rhythmically occurring choreiform movements in a youth of twenty. A year ago he had had an acute illness, called influenza, with much headache and nausea; after this illness the peculiar movements developed; they were limited to left hand, arm, leg and trunk, but the neck muscles escaped. These spontaneous movements occurred seventeen times a minute in the form of contractions in the left abdominal, shoulder, upper and lower arm muscles, and in the hand and the quadriceps femoris; these various muscles contracted simultaneously in a shocklike manner, each contraction lasting about a second. During the contraction a deep channel was produced in the abdominal wall, and the body was curved somewhat to the left; the shoulder was depressed, the arm adducted, upper arm remained straight (both triceps and biceps groups being affected), the hand somewhat flexed with extension of fingers, and the thumb was extended and abducted. Nothing else was found. After some months of continuation of the movements they gradually diminished in intensity and extent. As to the diagnosis, a focal process (encephalitis?) was thought of, either in the cerebellum or—more probably—the thalamic region. [Leonard J. Kidd, London, England.]

Netter, Arnold. CONTAGIOUSNESS OF EPIDEMIC ENCEPHALITIS. [Bull. de l'Acad. de Med., Vol. 83, p. 373, April 27, 1920.]

The author concludes that epidemic encephalitis is contagious, and is carried by saliva. He observed probably the first case that occurred in Paris and came to the conclusion of contagiousness from the fact of the outbreak of the disease in the same household, in this instance and in seven other instances. The contagiousness of the disease is very difficult to prove. The virus is located in the salivary glands. Durand, in studying the parotid gland in a case that ended fatally, found excretory ducts and acini, numerous mononuclears in the interlobular spaces around the

vessels. The lesions resembled lesions similarly located in hydrophobia, noted by Manouélian. The carriers of the disease are capable of transmitting it for a long time by reason of the long persistence of the virus in the nerve centers. Netter believes that it can be transmitted by a convalescent, by an individual suffering from an aborted case, or by a healthy person. Isolation is not advised when the majority of cases appear singly.

Marie, P., and Mestrezat. CLINICAL COMPOSITION OF THE SPINAL FLUID IN A CASE OF LETHARGIC ENCEPHALITIS. [Bull. de l'Acad. de Med., 83, 103, February 3, 1920.]

The following result of chemical analysis of spinal fluids is given:

	Spinal Fluid in Case of Lethargic Encephalitis	Spinal Fluid in Normal Persons
Albumin	00.14	0.15- 0.30
Fibrinogen	0.0	0.0
Chlorids	7.25	7.30
Dry extract	10.45	16.00
Mineral matter	8.75	8.75
Urea	0.326	0.20
Acetone	minute quantity	—
Sugar	0.94	0.53

These figures are given to emphasize the fact that lethargic encephalitis lacks the signs of meningitis. Marie thinks that the Kerning sign and rigidity of the neck are absent. From other data it is seen that the albumin and chlorids of the spinal fluid are normal in lethargic encephalitis, while in tuberculosis and the acute meningitides the albumin is increased, the chlorid diminished and the sugar decreased or absent.

Dopter, C. HYPERGLORACHIA IN EPIDEMIC ENCEPHALITIS. [Bull. de l'Acad. de Med., 83, 203, March 2, 1920.]

Hyperglorachia is not a constant finding in epidemic encephalitis, although an amount of 95 cg. of glucose to the liter has been recorded. Tuberculous meningitis which clinically simulates epidemic encephalitis to a certain extent, shows either diminution or absence of sugar from the spinal fluid. The sugar remains normal (50 cg. per liter) in syphilitic meningitis. The presence of hyperglorachia in diabetes, uremia, pneumonia, bronchopneumonia, Malta fever, hydrophobia, whooping cough, some cerebral tumors and hemorrhages, amyotrophic lateral sclerosis and in some cases of chronic cerebrospinal syphilis, proves its presence is not pathognomonic for epidemic encephalitis. The author raises the question whether it is only in cases with bulbar involvement that the sugar increase occurs.

Pilcz, Alexander. CONCERNING THE CLINICAL PICTURE OF EPIDEMIC ENCEPHALITIS. [*Neurolog. Centralbl.*, 1920, No. 12.]

Attention has been called by v. Economo to certain atypical cases of encephalitis lethargica. The author here gives five cases to illustrate the variety of forms which the disease may assume. The first case was that of a woman from a neuropathic family who became ill of grippe pneumonia. At the first examination there were no signs of a lethargic encephalitis or of any other form of this disease. The threatening symptoms set in three weeks after the grippe infection and last forty-eight hours, patient becoming somnolent, with ptosis and unilateral abducens paresis, and speech disturbance. Pulse constant at 120. Temperature normal. Other nerve findings normal. This condition was followed by a hypomanic state which receded in a few days. Patient recovered, but four weeks afterward there was recurrence of grippe and death ensued. The author agrees with v. Economo's view that the agent of grippe, which is as yet unknown, sets the virus of encephalitis into activity, or that the virus, which is probably the cause of grippe existing in the same organism as the virus of encephalitis, opens the portals to this latter toxin. Author is unable to say whether the manic psychosis is to be ascribed to the grippe or to the encephalitis. The second case was remarkable from the fact that peracute symptoms of meningeal irritation first made their appearance without any phenomena of grippe, and that only in a third attack, three weeks later did the signs of encephalitis come to light. This lumbar puncture revealed meningeal changes. Hyperkinetic symptoms were only slightly shown in the last days before death. The disturbances of the pupils were rapidly progressive. The third case was that of an epileptic and the author does not attempt to determine whether the psychic symptoms (echolalia, grimacing, monotonous chanting, etc.) were due to the encephalitis or were a prolonged "psychic equivalent." The signs of encephalitis first made their appearance about a month after the beginning of the grippe. The behavior of the pupils in this case was very peculiar. They were miotic, round and reacted only to very strong light and then only slightly and tardily. But if the patient was raised up from his recumbent position, the pupils dilated and were nearly mydriatic; they also reacted promptly but the patient did not awaken from the stupor and when he was replaced in recumbent position, the pupils narrowed again and were in the same position as before. The author believes that the phenomena in sitting position were due to the fact that certain subcortical centers were awakened. The fourth case was remarkable for the fulminating course and for disturbances in the vestibular reaction; the fifth for the recurrent course, and peripheral facialis paralysis. There were also disturbances of the kidneys but it is questionable whether these belonged to the encephalitis picture. [J.]

Rohde, Max. ACUTE HEMORRHAGIC SUPERIOR POLIOENCEPHALITIS AFTER INFLUENZA. [Monatsschrift für Psychiatrie und Neurologie, January, 1920.]

The picture of polioencephalitis acuta hemorrhagica superior [Wernicke], characterized by Oppenheim "Somnolence, rarely occurring apathy and sleepiness, paralysis of the eye muscles, manifold nystagmus." is here presented as a sequel of influenza. The patient was never unconscious or disoriented and showed no meningitis symptoms. [Stragnell.]

Stern, Felix. THE PATHOLOGY OF THE SO-CALLED "ENCEPHALITIS LETHARGICA. [Archiv f. Psychiat. u. Nervenk., 1920, Vol. 61, No. 3, p. 621.]

The author describes the autopsy findings of four cases. The clinical pictures are only roughly sketched as it is proposed to give these in detail in a later article. The first three cases are considered typical, while the third is described separately as presenting atypical histological findings. The author sums up his findings in the typical cases, stating that the anatomical picture of encephalitis lethargica consists in an interadventitial or periadventitial infiltration with lymphocytes, plasma cells and polyblasts, extending over wide regions of the brain, but attaining greater intensity in circumscribed areas. Parallel with the infiltrations there are changes in the ganglion cells, acute swelling and extensive degeneration; slight changes of the neurofibrils and somewhat more pronounced localized degeneration of the medullary sheaths; as well as strong proliferation of the glia cells and, in the more advanced stages, of the fibrillary glia and of the vessel wall cells. To a limited degree there is emigration of hematogenic elements into the ectodermal tissue and true new construction of vessels seems also to take place. The meninges are always extensively and diffusely involved in the inflammatory process, but there is no dependence of the encephalitic alterations on the meningitic. In the brain itself there is pronounced predilection for the gray matter with special preference for the large ganglia, especially the thalamus opticus as well as for the central gray matter of the third to fourth ventricle. There are besides diffuse alterations in the nervous tissue of the cortex and reactive changes of the glia without accompanying exudative processes. Further peculiarities of this disease are the absence of tendencies toward softening of the area showing inflammatory alterations, and recession of the exudative processes without residual traces or, at most, with only slight surviving phenomena in the form of sclerotic lesions with reparatory proliferations of the fibrillary glia and destruction of medullary sheaths or moderate diffuse gliosis. Attempts to discover the diplostreptococcus isolated by v. Wiesner were unsuccessful in the typical cases, and one of the author's colleagues suc-

ceeded in cultivating the bacteria from a case which presented the picture of unmistakable influenza encephalitis with grippe pneumonia on both sides. The author states, however, that this virus, like other similar agents, would not always give rise to the same clinical or anatomical syndrome, the disease being a resultant of various factors. In the author's fourth, very atypical case, cocci were discovered which were probably identical with v. Wiesner's, and the author cites this case to show the ultimate possibility, when all the atypical modifications of the more constant phenomena are recognized, of isolating a characteristic histological picture to correspond to the very rich clinical picture of encephalitis lethargica described by v. Economo. Hope of attaining this result, the author believes, lies in the direction of classifying the histological complexes of the various forms of acute exogenous toxic-infectious brain diseases into inflammatory and noninflammatory types (understanding by inflammatory the three processes, alternative, exudative and proliferative, or if it be preferable to reject the concept of inflammation from histology, the division exudative, ectodermal and mesodermal, following Schroeder, may be substituted). The author suggests the name encephalosis for the noninflammatory encephalopathies in analogy with nephrosis used for degenerative kidney disease to distinguish it from inflammatory nephritis, with subdivision into vascular and parenchymatous encephalosis. Many types of so-called influenza encephalitis described by v. Economo would belong to the vascular encephalosis. To the objection that the clinical pictures would be sundered by the histological differentiation according to this point of view the author replies that the lumbar puncture would probably serve as a transitional bridge between clinical and histological syndromes, as the meninges are nearly always involved in inflammatory encephalitis. The peculiar predilection of encephalitis lethargica for the region of the central gray matter and the large ganglia may perhaps be most naturally explained by assuming greater vulnerability at these points due to the special distribution of the blood vessels, with the assumption of a primary injury of the blood vessels apparatus, and not, with v. Economo, of a purely lymphogenous origin of the disturbances. [J.]

Briand, Marcel, and Rouquier, A. RELATIONS BETWEEN CERTAIN PITHIATIC OR ANORGANIC STATES AND EPIDEMIC ENCEPHALITIS. (Société de Psychiatrie de Paris, meeting June 17, 1920.) [L'Encéphale, 1920, August 10, Vol. 15, p. 520.]

Since the beginning of the present epidemic of encephalitis the authors have observed at Val-de-Grace a certain number of patients who, without any direct or indirect suggestion simulated parietic or choreiform syndromes, or the picture of pseudo athetosis with all the characteristics attributed to those conditions designated pithiatic or anorganic. All these patients were, intellectually considered, debiles, and their mental

make-up was a factor in modifying, transforming and finally fixing their symptoms. The authors question whether at the foundation of certain motor disturbances which arise suddenly and without apparent cause in individuals presenting constitutional signs of hysterical temperament there may not be an infectious element—a more or less violent toxic influence with cortical localization. [J.]

Cramer, C. D. LETHARGIC ENCEPHALITIS AND INFLUENZA. [Psychiat. en Neurolog. Bladen, 1920, Nos. 3-4, May-August, p. 161.]

In the influenza epidemic of 1890 many cases of involvement of the central nervous system were recorded, but during the recent ones of 1918-19-20 a larger number of more serious cases have been seen. We often see the so-called cerebral form of influenza develop in connection with the pulmonary form. Cramer here records two cases of lethargic encephalitis occurring during the influenza epidemic of 1918-19. In the first there was meningismus, high temperature, diplopia, ptosis, somnolence, masklike facies, muscular rigidity, katatonía, hypertension of cerebrospinal fluid and choreiform movements. In the second case there was meningismus, high temperature, diplopia, ptosis, nystagmus, somnolence, masklike facies and facial paresis. He records also a case of metapneumonic empyema, on an influenzal basis, in which numerous attacks of lethargy occurred over a period of many months without any of the other common signs of lethargic encephalitis. He goes fully into the literature and discusses the questions whether lethargic encephalitis is due to a filterable virus and whether it is a disease "sui generis." He lays great stress on katatonía which occurs so often both in lethargic encephalitis and in influenzal psychoses. This fact may be adduced in favor of the theory that lethargic encephalitis is etiologically of influenzal origin. Cramer concludes that lethargic encephalitis may be regarded as "a paragríppal syndrome." [Leonard J. Kidd, London, England.]

Bremer. MENTAL FORMS OF EPIDEMIC ENCEPHALITIS. (Société de Psychiatrie de Paris, meeting of June 17, 1920.) [L'Encéphale, 1920, August 10, Vol. 15, p. 517.]

The author describes four cases of this disease where the psychic symptoms were intense and of definite duration, at certain stages of the disease constituting the entire clinical picture. Two cases presented the syndrome of acute delirium; one, of mental confusion; and one, a child of nine years of age, of mania. In the cases of acute delirium and of mental confusion the symptoms did not differ from those usually met with in various toxemias; in fact in one of the cases they were such as to suggest the diagnosis of typhoid. There were no psychic sequellae in these three cases. It does not seem necessary, therefore, to assume any special cortical localization for the infectious process. None of the

patients presented the Parkinson syndrome. In the case of the child in whom the disease took the form of mania the toxic phenomena were not evident; indeed it could not be certainly proved that there was an infection, but a sort of "latent infection" (Netter) was assumed. In this child the phase of somnolence was followed by a period characterized by insomnia which persisted, and which was complicated with manic agitation. The insomnia so frequent at the end of attacks of encephalitis has been explained as the result of toxic impregnation and it is often accompanied by an extreme psychic overactivity. The well known susceptibility of the brains of children to toxic influences and the tendency of children to motor reactions probably accounts for the particular form which the psychic hyperactivity took in this case. [J.]

Boveri, Piero. THE ABOLITION OF THE REFLEX TO ACCOMMODATION IN LETHARGIC ENCEPHALITIS. [*Revue Neurologique*, March, 1920.]

In fourteen cases studied it was observed that in nine the reflex to accommodation was lost and in five cases was very slow. In eleven of the cases the reflex to light was normal, in three it was somewhat diminished. This loss of the reflex to accommodation with preservation of the reflex to light is the reverse of the Argyll-Robertson pupil and may occur early in the cases of lethargic encephalitis. The same thing has been observed in diphtheritic paralyses and cases of botulism. [Camp.]

Book Reviews

Dunlap, Knight. PERSONAL BEAUTY AND RACIAL BETTERMENT. C. V. Mosby Company, St. Louis.

This essay, published originally as the Psychological Review in 1918, contains some banal reflections, which to the reviewer contain the chief merit of being classifiable among the "many things that are not so." They seem to reflect the jejune ideas of an academic psychologist who knows all about it and apparently no one else has ever discussed the question. The chief idea gained is that Dunlap alone knows what beauty is, all other studies are puerile and superficial, and he has done a wonderful thing. We regard it chiefly as hocus-pocus masquerading for its *raison d'être* as something scientific. It is hardly worth the time and trouble to point out what we consider its many inaccuracies and prejudices which we are accustomed to see in some of our metropolitan dailies with all their slap-dash superficialities. When issued behind the smug sacrosanct of a university professor, we mourn the belittling of such opportunities. The "ignorance of the intelligent," as Chesterton so aptly phrases it, is well illustrated in this little brochure.

Guillaume. LE SYMPATHIQUE ET LES SYSTÈMES ASSOCIÉS. Masson et Cie., Paris. 6 fr. 50.

This small brochure is an excellent example of what can be done in the way of a short, succinct, accurate and readable digest of the chief features of the vegetative nervous system. We commend it to our readers.

Lord, J. R. THE STORY OF THE HORTON WAR HOSPITAL: EPSOM. W. Heinemann, London.

In simple yet graphic form this book from Lieut. Col. J. R. Lord tells how one of the mental hospitals of the County of London was turned over into a war hospital during the late combat.

As a record of able administratorship and a guide for such conversions should occasion arise this story will prove invaluable.

Martin, Lillian J. MENTAL HYGIENE: TWO YEARS' EXPERIENCE OF A CLINICAL PSYCHOLOGIST. Baltimore: Warwick & York, Inc., 1920.

Dr. Martin has given here an all too brief outline of the evidently very valuable work she is doing in San Francisco. There are too many fortune tellers and other exploiters of the credulity of the hypochondriacal masses and too few mental hygiene centers.

Dr. Martin has established an office where she gives advice concerning such apparently diverse conditions as insomnia, choice of a vocation, care of children and jealousy. In the present little volume the author has merely indicated the object with which she has undertaken this work and given some idea of the scope which it is already beginning to assume. A few cases are quoted briefly, the patients being referred to as "consulters," a rather clumsy term. It is anticipated that many valuable contributions to the subject of mental hygiene will come from this source in the future.

LIND

Stransky, Erwin. LEHRBUCH DER ALLGEMEINEN UND SPEZIELLEN PSYCHIATRIE. II. Specielles Teil. F. C. W. Vogel, Leipzig.

Five long, weary war years, the author tells us, lay between the two parts which make up this valuable text-book on psychiatry by Stransky. Finally, after many interruptions and amid much turmoil, the book was finished.

In this volume on special psychiatry the material is arranged somewhat as follows: The first chapter discusses the borderland between mental health and mental illness. Feeble-mindedness is then taken up. The Psychopathic and Degenerative States follow, and in turn are followed by Mental Disorders of a Degenerative Type, in which Stransky arranges Paranoia—the Manic-Depressive Psychoses. The Schizophrenic Group then is taken up, to be followed by the Thyreopsychotic States. Psychoses due to Constitutional Disease, to Advancing Years and finally the Chronic Infections and Toxic Psychoses make up this interesting volume, to which an Appendix on the World War and Psychiatry is added.

Stransky's book is well worth reading. It contains many original ideas and his descriptive talent is of no mean order. Although the general form of his arrangement is Kraepelinian, he is not a copier of Kraepelin's ideas. His discussions of points of view are specially valuable and we get an excellent angle of vision upon psychiatric problems. The language is vigorous and the emphasis makes the book a living document.

Galant, S. ALGOHALLUCINOSIS. August Hirschwald, Berlin.

On the basis of a careful analysis of three patients belonging, according to the usual regnant terminologies, in the paranoiac and katatonic trends of the dementia praecox group, the author makes an essay toward the separation of a special type to which he would give the name Allohallucinosis.

One is not much impressed with the chances of the survival of his differentiation when he starts with the following general dicta. "Allohallucinosis has nothing to do with dementia praecox. Dementia praecox is a disease in which the intellectual side of the psyche is chiefly involved. The sexuality either not at all or only slightly implicated. He states he has described typical cases of dementia praecox in a special article. The reviewer has as yet been

unable to obtain it. In Allohallucinosis the intellectual side of the psyche is uninvolved.

Here we are plunged again with the old academic psychological hodgepodge of different categories of the psyche. We are also told that the theories have little to do with Freud's theories. That the hallucinations are direct products of the unconscious, the understanding of which has not been attempted by Freud, and as for the mechanisms of unconscious, Freud seems to have had little understanding. A rather rapid reading of the monograph would seem to indicate that wherever the author was talking sense he was quoting Freud, and wherever he was misquoting Freud he was talking nonsense. The reviewer has been unable to untangle the ins and outs of the author's very befuddled discussion. Any clear notion as to what he means by his distinctions, that there is great opportunity for a finer series of differentiations within the dementia praecox medley, admits of no discussion. The author states that the psychoanalytic mode of approach offers such a means. His own particular applications of it he considers superior to any others. It may be so, but we are not much impressed by it save as an earnest attempt at the difficult and important task of sorting out the schizophrenic scrap basket.

Lafara, Gonzalo R. DIAGNOSTICO Y TRATAMIENTOS MODERNOS DE LA NEUROSIFILIS. Calpe, Madrid.

This is a recent volume of a new monograph series in biology and medicine inaugurated by the publishing house of Calpe of Madrid and sponsored by a number of Spanish scientists, Cajal and the author among them.

The author, a well-trained European neuropathologist, was for some time pathologist at St. Elizabeth's in Washington, during which residence a number of valuable studies came from his laboratory. Since his return to Spain he has also been very prolific, and this volume again gives evidence of his industry and his ability.

It is a very masterly summary of the modern studies of the problems of neurosyphilis and can be most cordially recommended to those acquainted with the Spanish language.

Sadger, J. FRIEDRICH HEBBEL. EIN PSYCHOANALYTISCHER VERSUCH. SCHRIFTEN ZUR ANGEWANDTEN SEELENKUNDE. Edited by Prof. Dr. Sigmund Freud, No. 18. Vienna, Franz Deuticke, 1920.

It is the second part of this title which must first recommend the book to the American reader. The author fulfills the promise of this title in that he presents one of the clearest, most penetrating psychoanalytic studies yet produced in the application of psychoanalysis to an extraneous subject. The term extraneous, however, is only apparently justified, because the reader will be more than ever convinced that the legitimate and useful territory of psychoanalysis is every phase of life, and that the topic of the creative

artist is the last to be excluded from the practical application of psychoanalytic study and investigation. The subject of this work, furthermore, is a man who stood close in his convictions and the expression of them to the fundamental principles upon which psychoanalysis is based and one who had an intuitive grasp of the basic psychic facts and mechanisms which psychoanalysis has discovered by the slower methods of science. Hebbel is not a poet well known to our readers, but for this reason we may acknowledge a further debt to the author of this study for introducing the thought and expression of a poet who has disclosed in all his utterances in his reminiscences, diary, in letters and conversation, as well as in his finished works, a striking realization of the existence of the unconscious and its relation to life and work.

Sadger has drawn mostly upon the poet's own words, those in which he has concealed even while he revealed himself, and has also introduced the testimony of those biographers who were close to him and knew him well. Sadger has given special attention first to the childhood of the man with all the influences externally at work and the child's own reaction to them. Hebbel himself has revealed an unusually full memory for childish events and feelings, but manifests at the same time a strong affective tendency to eliminate from his conscious memory the unpleasant elements and stress the happier ones. Nevertheless his manner of remembering, together with the testimonials gathered from the other sources, give evidence of the weighty influence of the varying features and elements of conditions and events of his childhood upon all his later life and work. These were not always favorable, nor was his reaction from the start such as to build out of them the personal character and the independence which would serve him in good stead in later life and work. Sadger has examined the results in the long story of Hebbel's love life with its revelations of the man's bondage to the infantile and the conflict with himself which results. He has studied with special care those dramas which are particularly filled with the poet's mostly unconscious self-confession, of the activity within him of certain well-marked infantile trends and libido fixations with the appearance of these in his creations.

Hebbel tended toward a compulsive neurotic development, showing in marked degree certain of the traits which distinguish that type of personality and that form of neurosis. These traits were in particularly strong evidence in the relationships of his personal life. They were determinants for a badly managed love life, with inability frankly and completely to shoulder the responsibilities of husband and father. They interfered with his otherwise strong and helpful friendships and caused him much personal remorse, indecision, restlessness. In his poetic work he was more successful. This has true elements of greatness and it attained to separate results that can be called great. Yet it, too, was impaired by overemphasis on certain infantile traits that manifest themselves in peculiarly exaggerated elements which appear in the dramas. In part

he achieved sublimation of these for himself and his readers. Yet in part they remain obtrusive and prevent the continued popularity which otherwise his dramas might have secured. They reveal, however, in skilful partial disguise the poet's own life with its self-born conflicts, and are therefore of much value as material for psychoanalytic investigation. They reveal elements common enough to all lives and at the same time the particular forms which made for neurotic development in this poet, and therefore explain their relation to both success and failure in creative work.

Mention must be made in particular of the poet's own direct testimony to the existence of the unconscious as the source of material for creative work. His recognition of the unconscious, while lacking the completeness of the psychoanalytic understanding of this side of mental life itself, certainly foreshadows this. It is so also with his belief in the importance of the dream and his recognition of its function and its activities. The examination of these direct testimonies on the part of the poet, together with the faithful and penetrating study of his life and work, make of the book an important contribution to psychoanalytic literature. It presents a newer and richer point of view for the literary student and for the psychologist carves deeply into the humanity of literature. At the same time it presents that material which gives a greater understanding of any human character, the source of its power and of the difficulties which impair this. For the medical psychologist it throws further clear light technically upon compulsion and other neurotic traits.

Maeder, Alphonse. F. HODLER, ÉTUDE DE SON DÉVELOPPEMENT PSYCHIQUE ET DE L'IMPORTANCE NATIONALE DE SON ART. Translated into French by J. C. Lenoir. Zurich, Rascher & Cie., 1916.

This little book consists of two charming essays upon the work of an artist whom Maeder considers a representative of his country in art as Spitteler is in the realm of poetry. The first essay concerns the psychological development of the painter as revealed in his successive works and the significance of his work and psychological expression to Swiss culture. In the second shorter essay the means by which he attains his results are discussed as illustrated in his various works. One would expect from Maeder's previous keen psychoanalytic studies that he would have given deeper analysis to the artist's work and his form of self-expression. The psychology is only of the more general and superficial type. He tells us, however, in these larger lines of the force and strength of the artist, his ability to synthesize in his productions not only the elements of observed reality, but his own inner forces through these. His work, therefore, is no mere impressionistic tale of what he has seen, but is rather an "expressionistic" representation of what a soul has felt and produced and synthesized for itself through these external features. These may be historical subjects, single isolated figures, subjects of various types. In this bringing together of genuine feeling and experience, the expression of it with a unity of compelling

force and strength, he becomes a typical representative of Swiss character and of Swiss history. The book is generally illustrated with copies of works of the artist.

Hobson, Richard Pearson. ALCOHOL AND THE HUMAN RACE. New York, Chicago, Fleming H. Revell and Company. 1919.

It is a matter of regret that so conscientiously intended a study of alcohol and its use should have neglected some of the wider background of the subject. Without this it rouses opposition, where otherwise the facts so abundantly presented here would have received greater attention from those who desire to face the subject in the light of the broadest knowledge possible and the most effective all-round approach to the problems connected with alcohol. The facts assembled take account only of the evils of alcohol, the author in his studies having been led to believe that these are the only discoverable facts. This is largely due to the fact that his study is a purely physiological one, the psychology being only a formal rationalization upon a basis of a wish ideal of perfection for the human race. It is not founded upon a realistic psychology of the human race as it is and has been slowly, very slowly altering through the ages of evolution. In that slow growth may be found a definite working relation between physiology and psychology which involves a service which alcohol has rendered in spite of its evils and which is perhaps not yet entirely null. The race must reach the idealistic ends of the author by slower means than he would advocate, because of the combined physiological and psychological nature which constitutes the human race.

Dunlap, Knight. MYSTICISM, FREUDIANISM AND SCIENTIFIC PSYCHOLOGY. C. V. Mosby, St. Louis.

While impatiently waiting in the Public Library to look upon the monumental researches of this modern Socrates, two books lay on the desk before the reviewer, "Charlotte Brontë and Her Circle" and "The Romance of Sorcery," and glancing within the one, filled with details of the life of a woman of genius, and within the other, the details of a phase of human insecurity, the thought was, how human the interests that lay therein combined. A tall thin-faced ascetic opposite was deeply concerned with the "Sacred Books of the Hindus." Just then a pile of books of the worker on the habits of animals and the maker of curves of psychological measurements was placed at the reviewer's elbow.

Wearily one turned to these myopic preoccupations which a large university supports—and with which but a few people in the world are vitally concerned—and which in a few years will go into the dust bin of oblivion, while the religions of the Hindus, the lives of the Brontës and the ways of Sorcerers will still be of human interest.

How can such a student of such phenomena ever understand the life of human beings about him, and when will universities still

mark with their approval as Science such balderdash. The work in question is just such as one would expect of a blind rat caught in a maze—defeat, failure, going here and going there, misunderstanding, misquoting, misreading, a tissue of stupid distortions, clumsy misrepresentations, and silly evasions based upon a host of phobic prejudices. Herein one finds a type of behavioristic response like that of a silly boy who has not grown up to understand the many-sidedness of a big world. Herein the reviewer finds nothing but dullness and stupidity quite characteristic of a certain type of "scientific experimentalist." Fortunately this type is in the minority, but there are enough of them to contaminate many who would be open-minded if they dared to even tentatively wander from the protective coloration of the academic cloister which gives them a living.

The subject matter emphasized in the title is stigmatized by Dunlap as an "obstacle in the pathway of science." We are rather inclined to view the activities here so distortionately viewed rather as obstacles in the pathway of certain pseudoapostles of science who hide behind their Ph.D.'s as sacrosanct of the validity of their own quite questionable hypotheses and elaborately and painfully devised mathematical formulae. We hesitate to quote that old saw about the relationships of "lies" and "statistics."

The book, to us, is a ludicrous defense reaction. Psychoanalysis he particularly signals out as a special obstacle to science. Piffle! Nothing can obstruct science when it seeks to learn about reality, not even Dunlap's hobgoblin antics. The psychoanalytic hypotheses are rather object lessons to make believe scientists who entrenched behind their academic chairs are screeching aloud their condemnation of many things they not only do not understand, but of the very essence which they seem fundamentally incapable ever of understanding by reason of their emotional limitations. William James was not afraid of studying mysticism seriously and honestly as a phenomenon. We are sure that the James's type of psychologist is not yet gone from the American universities.

One would like further to characterize this unutterably stupid production, but already too much space has been wasted in noticing it at all! We really must in justice think of the author as a spoiled child who later will learn of many things which in his infancy he did not appreciate, and that some day he will have a bitter taste in his mouth for this sudden attack of spleen.

Rettig, Heinrich. DIE PHYSIKALISCHE FORMEL DER SEELE. G. Braunsche Hofdruckerei und Verlag. Karlsruhe 1. B.

An interesting book. Beginning with an eccentric-looking mechanical design of a machine on the front cover, one dips within and finds the unfolding of an extremely fascinating thesis. The general idea is old, yet ever new. If one believes that the general evolutionary hypothesis is the best man has yet evolved, and if in point of time we must assume vast aeons during which elementary cosmic

forces were operative—when physical and chemical laws became habitual—then such physical and chemical laws set the stamp of design upon their children—the biological phenomena that although formulating their habits for some hundreds of millions of years—are as yet but babes in the woods in time comparisons with the Cosmos.

Upon a monistic mechanistic hypothesis, then, the author constructs life and its phenomena, of which consciousness, the psyche and the soul (the organism as a whole) are but the adolescent phases in this large evolutionary progression. As a partial excuse for his absolute materialistic presentation the author states that the task of science is to attempt to present truth—absolute truth—come what may. He has therefore developed his thesis in some two pages from the initial outlines of the physico-chemical foundations of the electron theory to a consideration of the "State" passing in strict scientific fashion through the Cell and the Organization of Cells—Cell State he calls in—his this first section. The second section deals with the "Menschen Staat"—Race—Race Problems—The Will to Reproduce—The Formation of Groups, Tribes—Organization of People—Folk Ways—Morals and Customs—Religions. His third section concerns itself with a critique of Knowledge and of Desire—Will. While he discusses the Philosophy of Life, its Objects, its Modes of Accomplishment and the "State" make up a fourth section of the book.

The entire sweep of life, its processes and its organization, are rapidly sketched from a foundation stone of physical and chemical law, and in a manner that commands respect, since the author is widely read, profound in his grasp of the active life of research about him and possessed of an exact and yet not too ponderous style.

The "physical formula of the soul" that he sketches is no materialistic horror, but a thoroughly compassed able type of evolution that we feel our German reading public will enjoy and profit therefrom.

Martin, Everett Dean. THE BEHAVIOR OF CROWDS. Harper and Brothers, New York and London.

Many years ago the reviewer gave to this magazine a summary of Gustav Le Bois, *The Crowd*, since which time but few students of psychological phenomena have done anything but rewrite his general notions.

The present work "carries on," however, and is to be welcomed as an excellent popular account of crowd psychology. In it, however, the reviewer feels he finds too much of the regressive and destructive side of crowd psychology and not enough of the constructive side—for the "crowd" has a much larger constructive function than either Le Bois or the author would credit it. Apart from this undue emphasis upon the more sinister aspects of class antagonisms the work is well worth reading.

Gennerich, Wilhelm. DIE SYPHILIS DES ZENTRAL-NERVENSYSTEMS. Ihre Ursachen und Behandlung. Julius Springer, Berlin.

The author tells us in the preface to this unusually well conceived and executed volume of approximately 300 pages that it is based upon a series of cases that he has followed from the beginning skin lesions to a more or less extensive involvement of the central nervous system. The developmental phases through which this has gone are carefully described.

The fate of the syphilitic Gennerich says is a problem of the treatment received at the hands of his physician. There is enough evidence, he maintains, to show how the gruesome stages of development may be avoided, and he lays down precise formulations relative to therapy from the very first indications of meningeal implications. With such meningeal symptoms come the positive signs of definite attack upon the disease. It is to further the knowledge how to meet these conditions that this book has been written.

The book is founded on an unusually large material, 8,000 cases. These, as stated, have been followed very minutely for 12 years, and here discussed from wide biological and pathological points of view. It is to be cordially commended.

Freud, Sigmund. DREAM PSYCHOLOGY. James A. McCann Company, New York.

We have had occasion to commend—under an English dress—this shorter presentation of Freund's "Traum Deutung." It is now presented to American readers, corrected, and with a somewhat florid and quite careless and inaccurate Introduction by a lay psycho-analytic devotee of self-advertising proclivities. Apart from this blemish—for good wine needs no such touting—the work is excellent. It is not to be considered, however, as a substitute for his much more important work already mentioned.

Schlick, Moritz. ALLGEMEINE ERKENNTNISSEHRE. Julius Springer, Berlin.

This work constitutes the opening volume of a new series of monographs on the Natural Sciences, issued by this enterprising publisher of Berlin. That a philosophical volume should be the initial one of a series on the Natural Sciences, the author says in his preface, may seem at first sight strange. On further reflection, however, what should be more reasonable than a study of the development of knowledge and of its theories as a forerunner to a collection of books on natural science?

And the editors have chosen an able representative for this general scheme. In 345 pages he has given a very clear and readable summary of the Nature of Knowledge, Problems of Thought and the Problems of Reality. These are the three divisions into which the book is divided. In the first section he deals with the meaning of Knowledge—knowledge in every-day life, knowledge in science, knowledge through perceptions, knowledge through conceptions, the

functions of definition—implicit definitions, the nature of judgments, judgments and knowledge, what is truth, what knowledge is not and the value of knowledge. From these one may in a general sense glimpse the author's trend. To get his complete story, we recommend reading the entire book. It is worth while.

Cobb, I. Geike. A MANUAL OF NEURASTHENIA. William Wood and Company. New York.

This is a very conscientious book. The author has made a distinct effort to write a serviceable treatise upon a series of manifestations which are admittedly very complex and confusing. He follows the older method of first dealing with an historical introduction in which the work of Beard is given a prominent place and then he discusses various later hypotheses. From the point of view of what nosology really signifies the author is a trifle prosey. All disease labels are hypotheses and he utilizes much valuable space stumbling around trying to straighten out a lot of useless verbiage. In this he does a lot of misquoting which only confuses rather than clarifies some situations. He arrives at the following definition. Neurasthenia is a condition of nervous exhaustion characterized by undue fatigue on slight exertion, both physical and mental, with which are associated symptoms of abnormal functioning mainly referable to disorders of the vegetative nervous system. The chief symptoms are headache, gastrointestinal disturbances, and subjective sensations of all kinds.

He then discusses etiology, and takes up the symptomatology. Inasmuch as he had included the vegetative nervous system in his definition it would have been expected to find some mention made of this part of the body, but little is made of the general facts which are today valuable and available for the understanding of the somatic neuroses from the standpoint of the vegetative nervous system. Vagotonia and sympathicotonia and the endocrinopathies in their relation to fatigue, to toxemia and a host of newer conceptions are untouched upon. Like many a conscientious work it lacks inspiration or modernity. A really valuable work on the neurasthenic syndrome and its delimitations from closely related syndromes is yet to appear in English.

Collins, Joseph Editor. NEUROLOGICAL CLINICS EXERCISES IN THE DIAGNOSIS OF DISEASES OF THE NERVOUS SYSTEM. Paul B. Hoeber, New York.

These contributions from the work of the First Division of the Neurological Institute of New York have been deserving of an earlier notice. They represent a wide range of experiences with many forms of nervous and mental disorders although in the manner of brief individual reports. They are not presented as exhaustive treatises on disease forms or methods of treatment. They offer rather a ready review which can catch the eye of the general practitioner or the neurologist who would refresh his ac-

quaintance with these forms or gain practical information and suggestion for some of the varied problems he has to meet.

Jelliffe, Smith Ely and White, Wm. A. DISEASES OF THE NERVOUS SYSTEM. A TEXTBOOK OF NEUROLOGY AND PSYCHIATRY. Third Rewritten and Revised Edition. Lea and Febiger, Philadelphia and New York.

This unique work on the disorders of the nervous system has evidently met with more than usual success since three editions have appeared within four years. Furthermore these editions are not mere reprintings but are essentially revisions and rewritings for each volume has been increased very materially in size, new illustrations have been added, the subject matter evidently has been very carefully gone over and rich material, which has come from many sources, been integrated with each rewriting. These sources are particularly revealed in the sections on vegetative neurology and the endocrinopathies, the abundant observations gathered through the war experiences upon many problems of sensorimotor neurology, and the rapid development of the teachings of psychoanalysis.

The general scheme of the book is refreshing. It makes a very valiant effort to get away from purely structural concepts and presents the entire body as an integrated mechanism showing varied types of malfunctioning, diseases or syndromes according to the general trends of the organization of the nervous system. The authors have come out much more boldly than have any recent observers for the dynamic viewpoint of the essential unity of the body. The nervous system is viewed as the organizer of the phyletic experiences through which the animal phylum has come through countless centuries from protozoon to man. This organization is dealt with strictly in accordance with such evolutionary concepts, and the well known generalization of Hughlings Jackson concerning functional levels of activity is utilized, amplified, and illuminated.

Thus the nervous system is organized to effect the metabolism of the bodily structures. The level at which this occurs is here dealt with under the conception of vegetative or visceral neurology. This important concept could have been more deeply emphasized, but as the authors well say much of this material is to be sought for in texts on Internal Medicine, although it must be confessed that as the reviewer sees them such texts with few exceptions still plod along old lines of description, and so far as showing an understanding of a dynamic pathology in which the nervous system plays a necessary and all important part they are hopeless graveyards of endless description of dead tissues.

In this section a masterly summary of the endocrinopathies is included. It is a distinct revelation to note how much of this important new material has been carefully analyzed in this comparatively small section. A large number of generalizations which the authors support will undoubtedly be modified, but it is quite evident they are aware of this, as they frankly say so, and the re-

viewer is of the opinion that the conclusions arrived at are about the best that are held at the present day. In fact, a number of the ideas expressed in the edition of 1915 which were here criticized as perhaps too premature have been shown to be more and more valid. Still this section will require careful revision in a new edition, so rapid have been the new observations in this important field. The insistence that the psychical organization must always be considered in any disturbance of the body's metabolism is a striking feature of this volume and one which is regarded as fundamental.

The section on sensorimotor neurology, which is the name given by Jelliffe and White to the second level of nervous functioning, has been the least altered. Neurology as a branch of medical science grew up almost exclusively along lines of disturbances of sensation and of motion. Hence the foundations of neurology as expressed in sensorimotor function have been the most deeply laid. They, therefore, are those best known and most easily presented in a textbook. This work has a most compressed section in this regard. We consider it almost too compressed. The authors have packed it so full that the sentences at times remind one of exercises in Latin prose composition. They must be read with great concentration. The pages are packed with precise and very detailed information. There is very little useless verbiage. Yet it is not didactic, but plastic, and the reader feels that he is handling a living machine and is seeing its struggles with thwarting conditions. The chapters on the lesions of the mid-brain are exceptionally well illustrated from the masterly work of Dejerine. Speaking of this master of French neurology, it may be noted that this work utilizes many of his diagrams, but it is also to be seen that the chief works of the leading workers in neurology the world over are called upon very freely. This is not done solely as quotation, but the results of a wide reading, and are welded into a whole. With the exception perhaps of Oppenheim's two-volume work on neurology, no recent work has so adequately presented the literature of neurology as the present one.

The sections on Physical Neurology are the easiest reading. The authors have frankly turned to an interpretative psychiatry. They are distinctly Freudian. That this point of view is amply justified witness the almost complete revolution in English psychiatry since the war. Medical psychology has been made a necessary requisite in the medical examinations in England, and in the last series of examinations two of six questions on medical psychology were on psychoanalysis. The revisions made in these sections have not been as thorough as we should like to have seen. Very little contemporary psychiatry has been added. Perhaps there has been little recent psychiatry, as the new pathways between the purely descriptive psychiatry of Kraepelin and the dynamic psychiatry of Freud has not been laid down firmly enough to warrant extensive alterations in the present descriptive outlines. The new sections on interpretations are valuable and suggestive along this line of criticism.

The authors are to be congratulated upon the success of this distinctly modern note in neuropsychiatry.

Wrightson, Thomas. AN ENQUIRY INTO THE ANALYTICAL MECHANISM OF THE INTERNAL EAR. With an Appendix on the Anatomy of the Parts Concerned by **Arthur Keith.** Macmillan and Co., London and New York.

This book represents an important contribution to the anatomy of the sound-receiving apparatus of the human body and the mode by which it functions. This study of sound and of the auditory apparatus is made by a man who brings to it an engineer's training and experience, a musician's knowledge and interest and who has collaborated throughout this work with the celebrated anatomist who has prepared the appendix. The book affords, therefore, a comprehensive study of the production of sound presented in great detail.

Special effort in the experimental work has been made to discover the significance of the changes of pressure and displacement in the liquid of the cochlea as passed on in their effect to the nerve endings. The author has here superseded the resonance theory of sound of Helmholtz. He finds sound to result rather from the displacement of the liquid and the movements of the basilar membranes.

Jones, Ernest. TREATMENT OF THE NEUROSES. William Wood and Company, New York.

The bulk of this interesting and entertaining small volume appeared in White and Jelliffe's *Treatment of Nervous and Mental Diseases*, but it has been rearranged, recast and edited into a handy small volume of approximately 230 pages.

For clearness of presentation, simplicity and ease of expression, as well as for its inherent value, this small volume is to be cordially recommended.

Mott, Fredk. W. WAR NEUROSES AND SHELL SHOCK. Oxford University Press, London.

Of the many score of works which came from the awakening of the medical mind of Europe when suddenly brought into contact with actual facts in such large proportions that they could not be evaded or shoved aside, this work of Mott's is one of the most interesting.

Coming as it does from a purely or essentially a laboratory worker, who was made a Senior Neurologist at the Maudsley Hospital, it records both in and between the lines the extraordinary widening of the vision of the medical fraternity when confronted by the myriad forms of nervous disturbance incident to the war situation.

Interestingly enough, it is dedicated to a "Group of American Officers" who were associated with Dr. Mott in his work at the Maudsley Hospital. The book, although somewhat irregular in the

development of its argument, contains a wide range of observations and gives a broader glimpse of the entire situation of the results of explosives than most of the books along similar lines.

It is a valuable addition to any library and very ably reflects the views of a worker in neuropsychiatric fields entitled to the most attentive consideration.

Watson, John B. PSYCHOLOGY FROM THE STANDPOINT OF A BEHAVIORIST. J. B. Lippincott Company, Philadelphia and London.

Here is a psychology that has the merit of dealing somewhat with human beings. It therefore merits serious consideration. Although we can not give it all the space which we think it is deserving, we do believe the author has taken a long step away from the purely academic phrasing of pseudoproblems and artificial classroom clap trap towards an understanding of behavior which will be of meaning to the students of psychiatry.

Psychology is here dealt with as a science of behavior. Man's acts are determined by something—his acts are adjustments to daily situations in life. As science leans towards prediction, so psychology as a science of behavior must outline how to predict with reasonable certainty what human activities will be under certain circumstances. A second important result that should come from psychological study would be the formulation of laws and principles whereby man's actions can be controlled by organized society.

Common sense was the first crude but genuine psychology and the author outlines how a scientific psychology has emerged therefrom by the study of graded stimuli. This leads him to outline the general principles of the conditioned reflex mechanism as formulated by Pavloff and Bechtereff, from which he passes to the problems and scope of a behavioristic psychology.

In speaking of psychological methods in Chapter II, the author does well to show how trained observation is a valid scientific psychological method. It needs no instruments. Conditioned reflex methods are then discussed and verbal report methods. Paragraphs on tests, statistical and otherwise, follow.

Chapter III plunges us into neurology and general neuroanatomy. There is entirely too much of this for a work of this kind. It could all have been condensed into general principles, which, unfortunately, when done, reveals the author's purely second-hand knowledge. It is not a vital acquisition for him. Thus a "shuffling" gait in tabes is not the usual gait. Vestibular function and speech function *are related*. Afferent pain endings are constantly functioning—maybe not as *conscious pain*, but to state they are not called upon to function is a mistake. Organic sensori-motor processes are very elaborately integrated with the speech function instead, as the author says, "poorly integrated (65)."

If we should carefully study any man's speech habits—R. L. Stevenson's, for instance, in his works—one could quickly prove that Watson is incorrect when he speaks of the "lack of complex

language habits connected with organic impulses." His external stimulus theory of hallucinations is equally inadequate. Modern psychopathology shows over and over again the symbolization of the wish internal as the most essential factor and the external factor plays a subsidiary rôle.

While the anatomical features of the spinal cord, the brain, mid-brain, cerebellum, corpus callosum, etc., are excellently portrayed, they could be omitted and the emphasis laid on pathways and functional activities. The sympathetic system discussion is very bad, inaccurate in our opinion and misleading. The sympathetic, he says, is "purely motor." It is under the "control of the motor nerves of cord and brain." Both of these statements are, we believe, inaccurate. Depriving the vegetative nervous system of its primitive reflex arc character has been one of the chief obstacles to the construction of a dynamic physiology and pathology. This error, we believe, goes on in the next chapter, where the metabolic neurological factor in muscle organs is spoken of as being "tremendously over-emphasized." The author quotes a few recent writers, but is unacquainted with the whole phyletic history of the situation. The chapter is otherwise highly interesting and valuable. The following chapters in hereditary modes of response-emotions, etc., is very attractive in spite of a few rather narrow-minded dogmatisms, chiefly founded on differences of terminology.

In general we find this a most admirable and useful work. From the standpoint of an evolving pragmatic neuropsychiatry it is a most valuable aid to breaking up old crystallized psychological formulations which impede progress and engender a vast variety of social, mental and physical maladjustments which result in disease, either mediate or immediate. Only one general fault seems to have persisted, and that is a certain dogmatism and instinct. "Say it *my* way" instead of a broader sympathetic, "it can be said in many ways, let us put it this way and compare the results so far as controlling the phenomena are concerned." The author's reliance upon "authorities"? outside of his own sphere of activity has led to the including of a number of things that are not so. These are few and easily corrected by the attentive and informed reader. They rarely interfere with the argument.

Tandler, J., and Ranzi, E. CHIRURGISCHE ANATOMIE UND OPERATIONSTECHNIK DES ZENTRALNERVENSYSTEMS. Julius Springer, Berlin.

The old dictum of v. Bergmann that brain surgery was a surgery of the central convolutions only has in a surprisingly short time been shown inadequate, as the masterly studies of Cushing, Elsberg, Frazer and Sharpe, only to mention American surgeons, has abundantly shown.

The present comparatively small volume—158 pages, large octavo—is a very fine piece of bookmaking, the photographic and colored plates of the best and the text a clear, concise and scholarly present-

tation of the operative technics of intracranial surgery. We can commend it unreservedly.

East, Edward M., and Jones, D. F. INBREEDING AND OUTBREEDING. THEIR GENETIC AND SOCIOLOGICAL SIGNIFICANCE. J. B. Lippincott Company, Philadelphia and London.

This last member of the series of Monographs on Experimental Biology follows the general line of its predecessors—presenting in a compact and thorough form the chief results of experimental investigation.

The authors first discuss rapidly the general mechanisms of reproduction and then that of heredity and after a short chapter on mathematical analyses of results go on to the central problems of experimental inbreeding and outbreeding.

Hybrid vigor or Heterosis is then dealt with historically and then recent results compared. Animals and plants behave essentially the same. In crosses which are fertile the effects are such as to contribute to a greatly increased reproductive ability, making possible a larger number of offspring. The causes for this hybrid vigor are then discussed; the complex of the Mendelian factors emphasized and the general conclusion reached that inbreeding is not necessarily a process of continual degeneration. Injurious effects are due rather to the segregation of characters with stimulation of heterozygote conditions. There is a definite trend here to sterility. [Hence the supremacy of the sex instincts over the self-preservation instinct in Freudian sense.—Ed.]

Thus cross-fertilization, either continuous or occasional, is the really successful method of multiplication everywhere. Sexual production became a better means to assure numerous progeny than asexual production and offered a greater variety of raw material for evolution agencies, although the two processes do not seem to differ much in their so-called "heredity coefficient"; but the Mendelian segregation and recombination possibilities are all on the side of the sexual method. Exogamy then revealed itself as an evolutionary principle of value. [See Freud's *Œdipus Complex*.]

A final interesting chapter in racial intermingling closes this very readable small volume. "To produce greatness a nation must have some wretchedness, such is the law of Mendelian recombination; but the nation that produces wretchedness is not necessarily in the way of producing greatness. There must be racial mixture to induce variability, but these racial crosses must not be too wide, else the chances are too few and the time required is too great for the proper recombinations making for inherent capacity to occur."

America's great experiment in producing a great race is in progress—what the results will be the authors do not hazard an answer, although they do give some entertaining conjectures. To those observers who are still prudish about Freud's "Pansexualism" this biological treatment would be revealing.

JELLIFFE.

Melville, Norbert J. STANDARD METHOD OF TESTING JUVENILE MENTALITY. J. B. Lippincott Company, Philadelphia and New York.

This is a thoroughly practical and very handy small volume for all who would carry out the Binet tests in a consistent and orderly manner. The marginal page arrangement makes it an excellent tool to have at hand in doing this work.

Kleist, K. DIE INFLUENZAPSYCHOSEN UND DIE ANLAGE ZU INFEKTIONS-PSYCHOSEN. Julius Springer, Berlin.

This is volume 21 of the Foerster-Wilman's monograph series and is a short (55 p.) clinical study of some 19 personally observed cases in different parts of Germany. The great multiplicity of appearance is that which has been commented upon frequently. While there is little that is striking or original in the study, it is nevertheless quite readable and instructive, although it does not penetrate beyond the purely descriptive stage.

Ries, Julius. DIE RHYTHMISCHE HIRNBEWEGUNG. Paul Haupt, Bern.

An amusing and interesting, rather rambling and inconsequential series of notions relative to a rhythmical control of the brain movements and the functional significance of the brain membranes and sulci in their control of the cerebrospinal fluid and the nourishment of the entire nervous system.

Humoralistic pathological ideas govern the author's thought and interpretation formulae. His notes on the biochemical character of the cerebrospinal fluid and his efforts to bring them to service in constructing his humoral pathology are suggestive even if rather haphazard.

Braun, Ludwig. HERZ UND PSYCHE IN IHREN WIRKUNGEN AUF-EINANDER. Franz Deuticke, Leipzig and Wien.

From personal experiences with anxiety the author has passed to a short and pleasing essay upon the mechanisms involved. His historical résumé of the poetic and artistic terminologies is especially valuable and suggestive; from this he passes to a very helpful and practical discussion of cardiac neuroses, a subject very much in need of better understanding by all physicians.

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BELIEF AND MENTAL ADJUSTMENT

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It is a curious fact that, in certain types of mental disorder, one may find the patient holding the most absurd beliefs about certain things, while in regard to every other subject, he shows a soundness of judgment and mental vigor which is in no way inferior to that of the average normal man or woman. It is unreasonable to suppose that such false beliefs are due to any physical disease affecting the brain, for how could any injury to the brain destroy the soundness of a man's judgment on one or two subjects but leave him free to reason quite logically in regard to all others? What then can be the cause of these delusions?

For an answer to this question, we must turn to and consider the reasoning processes of the so-called normal. One frequently finds people who are keen and shrewd holding to views that are obviously unsound. These absurd beliefs, however, as a rule cause us no surprise, nor do they awaken in our minds any doubt as to the sanity of the people by whom they are held. This is because we can see the causes which have given rise to them. They are the result of passion or self interest, and we are all of us familiar with the power of emotion and desire to warp the judgment and give rise to obviously false beliefs, even in the minds of men who are above the average in shrewdness and intelligence. Now the purpose of this article is, first, to show by means of an illustrative case, that the false beliefs

we are accustomed to regard as manifestations of mental disease are also, sometimes at least, the result of passion or desire, just the same as false beliefs occurring in normal individuals, and then to discuss the question of why our emotions and wishes play such an important part in determining belief, and why, in certain cases, they give rise to beliefs so illogical and absurd as to lead people to regard them as evidence of some underlying mental disease.

The case I wish to present is that of a man whose life had always been singularly cheerless and barren. He had never had the usual pleasures or means of emotional outlet which play such an important part in making life worth while for the bulk of mankind. He had grown up in the country, the son of an alcoholic father who was harsh and cruel to him. His home had been cheerless and unlovely. Most of his time, during early childhood, was spent helping with the work on the farm so that he never had the usual opportunities to play with other boys. He only attended school at irregular intervals when his services were not needed at home. At an early age he had been taken from school altogether and put out to work for "an old skinflint." After this he continued to work as a laborer in the rural district where he was born until he was twenty-nine years of age when, owing to his parents' failing health, he returned home and took charge of the farm. He had never mixed much with his fellows but when, between the age of thirty and forty, he became quite deaf he grew, if possible, still more solitary in his habits. He had absolutely no friends or companions and after the death of his parents, his mother dying when he was forty-three and his father several years later, he lived quite alone, working his farm by himself, doing his own housework even to the baking and washing and only coming into contact with his neighbors when he had business to transact with them. Leading this solitary and unwholesome life, he developed a variety of absurd practices and beliefs. He indulged in what he called "trances," in which he danced, sang and performed a variety of absurd antics all by himself. He heard imaginary voices and saw visions. But in spite of these mental peculiarities, he was able to run his farm, to save money and in his queer hermit way to get along fairly well up to the age of sixty-five, when he became somewhat depressed, felt he was old and worn out and at his own request was sent to a hospital.

Let us trace, step by step, the development of this man's mental peculiarities and see what the causes were which gave rise to them.

The first peculiarity he displayed was seclusiveness, a tendency to avoid the society of his fellows. This although perhaps not in

itself a manifestation of mental disease, nevertheless is of importance because out of it grew the more striking peculiarities which developed later. It is therefore necessary that we should consider the causes which produced it. Seclusiveness, although it may develop, partly at least, as a result of inherited predisposition, is frequently in the main the result of circumstances. Whether the shy and sensitive person learns to mingle with his fellows or not depends largely on the conditions under which he grows up. Sociability is an art which must be acquired, although of course all people do not show the same aptitude for it. Ordinarily, the boy develops social habits from being thrown into intimate contact with other boys at school and at play. But the man whose case we are considering did not have the usual opportunities to develop such habits. He had during his childhood, as we know, but little opportunity to play or mix with other boys, most of his time being spent working alone on his father's farm. Therefore his social tendencies were not given an opportunity to develop during the early formative period of life and, after he grew to manhood, the life that opened up before him on his father's farm made it easy for him to continue in later years the habits formed in youth. Then another potent factor developed which served to cut him off still further from his fellows. This was his deafness. The loss of hearing makes social intercourse so difficult that even the most gregarious natures show a tendency to draw into themselves when they become deaf. For one who was shy and sensitive and had never learned to mix with people, it would naturally prove an almost insurmountable barrier to all social intercourse.

Now because a man keeps to himself, it does not follow that he has no desire for companionship. Man is a gregarious animal and is seldom satisfied to live alone. As a rule, when he does so it is not from choice but because a barrier of some kind shuts him in. What could such a barrier be? There is one that to a greater or less degree tends to check the social impulses of all of us. That barrier is shyness. Shyness has its root in the concern we all feel regarding the attitude of other people toward us. It manifests itself in a tendency to shrink from any situation where we may be subjected to ridicule or be unfavorably received. Thus we are shy when conscious of any peculiarity or defect in ourselves that might give rise to adverse criticism. One feels shy in a formal gathering if he thinks he is not properly dressed for the occasion. We are likely to feel shy in the presence of anyone of whom we stand in awe. Thus a man may be embarrassed in the presence of some important personage or when obliged to appear before a large number of people

at once, being in the latter case impressed by the sheer weight of their numbers. A man does not as a rule feel embarrassed in the ordinary situations of life or in the presence of his every day associates. Here it may be said that familiarity has bred contempt. It is in the unusual situations that shyness manifests itself, the situations that awaken his self consciousness, his doubts and concern as to what kind of an impression he may create. Since it is the unusual or difficult situation from which we tend to shrink, we can easily see why the sensitive person who has for any reason been so unfortunate as to develop seclusive habits will feel a tendency to avoid his fellow men altogether. Being accustomed to live entirely alone, every situation in which he is thrown into contact with them will be for him, an unusual one and so make him self conscious and embarrassed. We can, most of us, appreciate the shyness which makes a man fear to speak from a public platform but we seldom stop to think that for one man it may be a more unfamiliar and trying ordeal to participate in the smallest and most informal social gathering than it is for another to stand up and address a vast audience. The man of solitary habits is stiff and awkward when in company. He does not know what to say or do. He is painfully conscious of his own shortcomings which, of course, only makes them worse. So although he is hungry for companionship, he comes away from every such experience with a feeling of relief and an inclination to avoid similar experiences in the future.

But this hypersensitiveness of the seclusive person not only serves to wall him off from his fellows; frequently it also makes him antagonistic to them. Being so keenly aware of his own blunders, his own awkwardness and stupidity, he feels that everyone else must notice them also and that therefore he must be an object of ridicule and dislike. He tends to think that every laugh is at his expense. Every careless word is for him a rebuff. Therefore he develops the belief that people are against him and not only avoids them but comes to assume toward them the same attitude of hostility which he imagines they feel toward him.

With this explanation we can understand what happened in the present case. This man longed for companionship but, being of a sensitive nature and still further handicapped by his deafness, he was unable to break through the solitary habits formed in youth. Then like others similarly situated, he began to believe that he was regarded with ridicule and dislike. In his case circumstances were particularly favorable to the development of such a belief because, in the first place, his deafness which helped to cut him off from

social intercourse, also by preventing him from hearing what those about him were actually saying, made it possible when he saw people talking or laughing together to imagine that they were saying things about him; in the second place, living the life of a recluse, he had developed many peculiarities, so that he really was more or less an object of derision in the rural community where he lived; no doubt he frequently was made the butt of his neighbors' none too delicate jokes and these experiences formed an excellent groundwork for his belief that people were against him.

Thus it was that he came to cherish two desires, a desire for companionship and a desire for revenge on those who had insulted and jeered at him. As he drudged away in his solitary round of farm duties, he indulged in fancies and day dreams in which these desires were gratified. He pictured to himself a wise and powerful friend in whose society he would never be lonely and who would be so superior to the people who had insulted him that their contempt would be turned into envy. He dreamed of this superior being punishing his neighbors for the slights he had suffered at their hands and, as he had invalid parents to care for and also suffered more or less from ill-health himself, he pictured this protector as having a knowledge of medicine that would enable him to treat both his parents and himself when they were ill. Then, because he found comfort and satisfaction in so doing, he began to assume that such a person really existed and the outcome of this was that, in course of time, what at first had been only a pleasing fancy grew into an actual belief. He came to believe that there was a real person watching over him whom he called the "Spirit Doctor." In this belief he found a good deal of comfort and satisfaction, as is clearly shown by his own words. He said, "He (the Spirit Doctor) is very robust. He will live longer than me and take care of me all my life. He is a great comfort. The neighbors don't like it; they're envious. I am disliked. I don't like their society. He is so much better company than they are. They're so ignorant compared to him. If it hadn't been for him I would have been obliged to pay the local doctor two dollars and a half a visit. He takes an interest in me because I'm a poor fellow and he's not selfish. Lots of times he has punished people who have imposed on me. He humiliated them." How he punished and humiliated these people will be shown presently.

Having turned from reality to make believe as a means of obtaining satisfaction, it is not surprising that, upon the extravagant beliefs in which he first sought to find satisfaction, he should build

others still more absurd so that he soon began to interpret the little ordinary events of everyday life in ways that pleased his own fancy and that lent support to the extravagant ideas he had already developed. Thus it came about that he began to find satisfaction in assuming that trifling incidents or misfortunes which befell his neighbors were the work of his powerful protector and were meant to punish them for insulting him. For example, he told of one occasion when the grocer insulted him and was punished by the Spirit Doctor who caused him to make a mistake in his change. He told of another when this same man, having insulted him, had tried to set a pail on the scales but the Spirit Doctor made it fall off and when he set it up a second time it again fell off. In this absurd reasoning we see merely a concrete example of the fact that one false belief breeds another; when a man begins to indulge in faulty methods of thinking they tend to become habitual and to lead him farther and farther astray; moreover, the false beliefs which he builds up serve in their turn as premises upon which to build other beliefs that are still more extravagant until in course of time a man, who perhaps to begin with was by no means lacking in intelligence or judgment, loses himself in a hopeless tangle of absurdities.

Absurdities of belief must inevitably lead to absurdities of conduct. A man's behavior is largely determined by what he thinks and his judgment cannot be seriously impaired without his conduct being affected also. So it was in the present case. This man's absurd beliefs had been developed as a means of satisfying his emotional demands but he did not stop at merely indulging in pleasing fancies. In certain cases he carried this game of make believe still farther by acting as if the things he imagined were really so. Like other people, he felt the need of recreation. He craved the emotional outlet that is to be found in music, dancing and competitive games. The conditions under which he lived however offered but little opportunity for gratifying these demands; moreover they could not be gratified under any conditions except by performing the, for him, impossible feat of breaking away from his solitary habits and mixing with his fellows. Following therefore what had grown to be his customary type of reaction, he sought to satisfy his desire for emotional expression by resorting to make believe. He says that he had been at "mesmeric shows" where the subjects had been put into a trance in which they seemed to see angelic hosts and in which as a matter of fact the "professor" said they actually did see them. He thought that it would amuse him to pretend that he too had trances. So he used to play at going into a trance in which

he would dance and sing or box or fence with an imaginary opponent like the subjects he had seen in the "mesmeric shows." And while at first he appears to have realized clearly that these games were nothing more than make believe, he ended up by almost convincing himself that they were genuine. To quote his own words, "I found out afterwards that they were real, not just monkeying." It is stated that in these trances he sometimes used to make a great deal of noise, singing and shouting in such a loud voice that his neighbors could hear him half a mile away.

Now although he found a good deal of satisfaction in these trances, his pleasure was considerably marred by a realization of their absurdity. He saw that he was indulging in a very childish performance. He knew that the noises he made were not particularly melodious, that his antics were ridiculous and uncouth. He himself said that, by indulging in them, he "shamed his poor old father almost to death." He was keenly aware of the fact that he was making himself an object of derision in the eyes of his neighbors. The dissatisfaction to which a true realization of this situation gave rise he sought to overcome in the way that had now become habitual to him. He developed ideas in regard to his trances that were more conducive to comfort and satisfaction than was the reality. He overcame his shame at his childish behavior by convincing himself that it was not childish at all, that his trances were really wonderful experiences sent by his friend the Spirit Doctor to improve his health and circulation. He developed a comfortable satisfaction with his clumsy antics and unmelodious vocal efforts by assuming that the Spirit Doctor was guiding and controlling his movements so that he was really giving wonderful exhibitions of dancing, fencing and boxing and that his shouting and singing was not mere noise because the Spirit Doctor had conferred upon him a marvellous ability to "play like a lot of instruments and sing like a lot of voices, all men and women in perfect unison." One can easily imagine the added pleasure and satisfaction to be found in singing and dancing by a person who was able to convince himself that he was giving such an extraordinary performance. As for the ridicule of his neighbors, having convinced himself that his behavior was not absurd at all, he was able to dispose of that without further ado by attributing it to envy of his superior accomplishments.

The device he had hit upon for giving outlet to impulses he would otherwise have been obliged to hold in check, he proceeded to use as a means of satisfying a variety of emotional demands. For example, it has already been pointed out that he felt a good deal of

resentment against his neighbors who he believed regarded him with ridicule and contempt. Sometimes when these people insulted him—or at least when he thought they did—he would become very angry and feel a strong desire to “call them down.” He did not do so however, probably because he was of a timid nature and was afraid of what the result might be; instead he gave outlet to his anger by shouting a lot of senseless gibberish and then making himself believe that in doing this he was acting under the direction of the Spirit Doctor and was calling his enemies down in some foreign language. This type of reaction, from his point of view seems to have been highly satisfactory. On the one hand, it gave him an outlet for his emotion and the pleasing sense of having “called down” the object of his anger in a very superior way. On the other hand, it was a perfectly safe performance since the man called down, not understanding what was said to him could not very well resent it. He made use of this means of expressing his anger once after coming to the hospital. An attendant having offended him, he retaliated by shouting a lot of gibberish. Afterward he told the physician about it. He seemed pretty well satisfied with his own performance, said he did not know what language the Spirit Doctor had used in speaking through him but thought it was probably Italian, neither did he understand what he had said to the man but he knew it was “pretty aggressive.” In a general way this reaction is not so very different from that of the normal individual who gives expression to his anger by muttering under his breath the abusive epithets that he dare not speak openly or actually does what this man only pretended to do, relieves his feelings by saying insulting things to a person in language he does not understand and therefore does not resent.

But this man's indulgence in make believe and self deception not only distorted his reasoning processes and gave rise to absurdities of conduct; it also caused him in course of time to be seriously misled in regard to his perceptions of sight and hearing. In the first place, in his trances he had not only indulged in a variety of absurd antics but also had pretended that he could see “angelic hosts” like the subjects he had seen in “mesmeric shows.” The mental pictures he was able to call up in this way however never had the vividness of reality and he never succeeded in deceiving himself as to their true nature; there were however two periods of his life during which he saw visions that were much more vivid and were evidently of quite a different nature. One cannot be certain as to just what these visions were. Probably they were nothing more than mere dreams or the so-called hypnagogic hallucinations which many normal peo-

ple experience when just dropping off to sleep for they never appeared to him except in the darkness and after he had retired for the night. There was therefore probably nothing particularly abnormal in the visions themselves. What was abnormal was the attitude of mind which led him to attach an entirely false significance to them, an attitude of mind due to habits of thought which were steadily leading him farther and farther away from the solid ground of reality. During both of the periods in which these visions occurred he was under an unusually heavy emotional strain and they were evidently an expression of the thoughts and desires that dominated him at the time. It will be worth our while in passing to consider rather briefly the content of these visions since they throw a good deal of light on the man's emotional conflicts and the ways in which he attempted to deal with them.

The first time he saw these visions was after sustaining severe financial losses. His barn had burned and a local bank had failed, carrying off a large part of his hard-earned savings. He was now living quite alone, his parents being both dead, and as he lay in bed at night he used to see women come into his room. Describing these visions he said, "there were tall girls and short, all kinds, and they used to get right into bed with me. They wanted me to hire them to come and live with me and I felt sorry and ashamed because I was poor and could not afford to take them in." Evidently the visions of these women who came to his room and begged to be taken in were an expression of his own desires, his longing to have a woman with him in the house, to make a home for him, to relieve his loneliness and also to satisfy his sexual demands. But these desires were apparently closely related to his concern over the loss of his money. How is this to be explained? I am inclined to think it was due to the fact, although he himself may not have been clearly conscious of it, that money meant to him the means of satisfying his desires. He wanted companionship, the gratification of his sexual demands, all the pleasures of life, but his seclusiveness was a barrier which prevented him from going out and finding among his fellows, in the only way possible, the means of obtaining satisfaction. His energies and interests were therefore deflected into other channels, into other forms of activity which were really a more or less blind groping after the things his nature craved. He saw in money, as we all do, something which can be exchanged for the good things of life. He felt more or less vaguely perhaps that, if he only had enough of it, it would be the "Open Sesame" to the gratification of his desires. His thoughts and efforts therefore turned to the acqui-

sition of wealth until, as frequently happens, money became an object in itself and he almost lost sight of the uses to which it may be put and which make it a thing worth struggling for. But, in the back of his mind, there always remained a more or less vague realization that the money for which he toiled so hard was not merely so many dollars in the bank but was the means by which he was going to secure at some future time the good things of life which he so greatly desired. Then, when his money was so suddenly snatched away, its loss called up vivid pictures of the things it represented, things he now felt had passed entirely beyond his reach. The vision of the women who came to his room begging him to take them in and his shame and sorrow because he was poor and could not afford to do so were, therefore, merely an expression, somewhat fanciful as dreams usually are, of his own desires and of his grief over the loss of his money which made it impossible for him to gratify them.

The second period during which he saw these visions was several years later. These later visions also were an expression of unsatisfied desires and are of interest to us because they show the conflict that went on at this time between his sexual instinct and what for lack of a better term we may call his moral sense, and also, which is more important, because they show the way in which he reacted to these opposing forces. He states that he had some disreputable neighbors and the Spirit Doctor made him see pictures at night of the things that went in their houses. They were degrading lascivious scenes. The people were of that sort. He, himself, had always been decent. Because he did not wish to see these scenes, he hung curtains and blankets in front of his windows to shut them out, but it did no good, so finally he even went the length of leaving his bed and going out to the barn to sleep in order to get away from them. Now evidently these "lascivious scenes" were merely a vivid expression of his own erotic fancies from which the moral side of his nature impelled him to turn away, this moral impulse being so strong that it even caused him to leave his bed and go out to the barn to sleep in order to escape them. But he found, as have many others, that the demands of his own nature were not to be escaped in this way. Being then unable to get away from his erotic fancies and at the same time unable to give them free rein without doing violence to his self respect and ideas of decency, what was he to do? What he did was to follow his habitual practice of self deception. He overcame the dissatisfaction which resulted from his inability to inhibit his sexual ruminations by disclaiming responsibility for them. They were not an expression of

his own desires. He himself had always been decent. They were visions of what went on in the homes of his neighbors who were "that sort." This belief he apparently found to be quite a satisfactory one. The contemplation of his lascivious mental pictures now no longer caused him shame or humiliation; on the contrary being a manifestation of the moral degradation of his neighbors whom he disliked, they produced in him instead an agreeable sense of his own moral superiority.

Here we see a type of reaction that is by no means confined to those we are accustomed to regard as mentally deranged. The practise of gratifying our own disreputable desires by allowing our thoughts to dwell on the real or imaginary misdeeds of others is one of which even the most righteous are sometimes guilty. Hence the love of scandal, the desire to expose and dwell upon the frailties of others so frequently seen in those whose own lives are patterned rigidly upon the strictest moral code. These individuals whose pride or moral scruples prevent them from yielding to the demands of their instincts and in many cases from even admitting that they feel such demands, find a vicarious satisfaction in allowing their thoughts to dwell on the indiscretions of their weaker brothers and sisters while at the same time they compensate for this indulgence and get a pleasant glow of moral superiority and self approval by severely condemning the vices that appeal to them so strongly.

This man's indulgence in pretense and make believe also led him in course of time to hear imaginary voices. These were not mere episodic occurrences like the visions but continued without intermission over a good many years; moreover they occurred not only at night but also in the daytime during what was undoubtedly clear waking consciousness. They were therefore evidently quite different from his false perceptions of sight and, in order to understand them, it will be necessary to consider certain of the processes which underly all perception and how these processes make it possible for a person to see and hear things which have no existence outside of his own imagination.

People commonly assume that when they perceive a thing, this perception comes entirely from without, that it is due altogether to the sensory impressions they receive at the time. This view is incorrect. Perception depends not merely upon the registering of sensory impressions; memory and imagination also play an important part. A little reflection will show this to be so. Everyone knows that familiar things are perceived clearly under conditions in which unfamiliar things can scarcely be perceived at

all. For example, if we look at an unfamiliar face in a dim light or from a considerable distance, we may be unable to obtain a clear impression of it, while a well known face under the same conditions is seen quite distinctly. Or again, if we look at words written in unfamiliar characters or an unknown tongue, we may be unable to make out what they are, while other words, no more distinct but written in familiar characters and in our own language, are read without difficulty. What is true of sight is also true of hearing. The familiar word or phrase we seem to hear perfectly even when mumbled in a low and indistinct voice while a foreign word or any unfamiliar combination of sounds must be pronounced very carefully if we are to be at all certain as to what it is. The explanation of this lies in the fact that we fill up the gaps in our imperfect sensory impressions from memory or imagination. We see or hear enough of a thing to get an idea of what it is and then from the storehouse of memory we call up a picture or image of the thing perceived which we superimpose, as it were, upon the more or less vague picture painted by our senses. The two impressions thus obtained fuse in consciousness to give us a single fairly clear picture which we tend to regard as an actual auditory or visual impression. Thus since we are all of us continually seeing and hearing much that is really not conveyed to us by our senses, we are all of us, in a sense, hallucinating every day.

This process of supplementing our visual and auditory impressions with images drawn from the storehouse of the mind is a very important one. The function of our senses is to keep us informed regarding our environment so that we may adjust ourselves to it. We require a clear appreciation of our surroundings and it is a matter of secondary importance where or how we get it. Our sensory impressions are as a rule vague and incomplete, much more so than we realize, and if we were obliged to depend upon them alone we should be very badly off indeed. So we can see how important it is that they should be supplemented in this way. If it were not for this process most of the words we hear spoken would be mere indistinct noises, most of the things we look at would have no meaning in our eyes. In fact we may even go so far as to say that without the aid of these pictures painted by memory, perception as we know it would be absolutely impossible. It was this fact which led Helmholtz to compare the perception of external objects to an interpretation of signs, the visual and auditory sensations being regarded as signs of which the mind takes no more note than is necessary to learn their meaning.

But this process of superimposing memory image upon sense impression, although an essential part of perception, makes it possible for us to be rather easily misled in regard to what we seem to see and hear. The pictures which we superimpose upon our sense impressions may in certain cases be quite different from the reality so that we seem to see and hear things which have no existence outside of our own imagination. A great many cases of such false perception have been reported. For example, Binet tells of a young man walking in the woods in the evening who distinctly saw in a clearing a large fire lighted with Gypsies camped about it. The night was dark and the place lonely. The young man was afraid; he lost his head completely and brandishing the stick he held in his hand, he dashed furiously into the Gypsies' camp to find himself a moment later standing alone in the middle of a pond, feeling the chill of water which rose as high as his knees. A Will-o'-the-wisp was flickering on the surface of the pond and it was this shining spot which had called up in his mind the picture of the camp fire with the Gypsies around it, a picture which for him had the vividness of reality. Everyone of us has been misled in this way to a greater or less degree. What mother^o has not seemed to hear the voice of her child crying and on investigation discovered that what she heard was only the moaning of the wind? Is there anyone who at some time or other has not seen in the indistinct shape of a bush or stump the form of a lurking enemy? We are all of us constantly being misled in regard to what we see and hear but we are so accustomed to the fallibility of our perceptions that our tendency is to correct these errors almost automatically. Sometimes this tendency to think we see or hear that which is merely suggested to our minds is played upon with more or less deliberate purpose. For example, it is utilized by the artist who is able to suggest the presence of certain things in a picture by one or two clever strokes of his brush. We, looking at the picture afterwards, supply the details for ourselves and feel that we actually see them. Sometimes the tendency to mistake the imaginary for the real gives rise to false perceptions that are corrected with difficulty or not at all so that the individual is seriously misled by them. Let us consider the factors which give rise to such false perceptions.

First, there is as already pointed out the incompleteness or lack of clearness of our sensory impressions. It is the indistinctly muttered word that as a rule we do not hear aright, the form vaguely seen in the dusk that we mistake for something else. This factor, however, is only a predisposing one. It makes false perception

more easy but does not of itself give rise to it. We are not likely to be very seriously misled by our unclear sensory impressions unless there is some other cause operating which leads us to place an unwarranted interpretation upon them.

This leads us to the second factor in false perception, which is the tendency to superimpose upon our indistinct sensory impressions those mental pictures which are most vivid or prominent in our minds at the time. For example, if I have been thinking of a certain person, his image will occupy a more prominent place in the picture gallery of my mind than it otherwise would and there will therefore be a greater tendency for it to be pushed forward into consciousness and to be identified with any indistinctly seen figure I may encounter. Or again, if I go into a room where I am accustomed to see a certain person, his image is called up by a process of association so that I am likely to think I see him in the first form at all resembling his which meets my eye. These mental pictures which are apt to lead us astray may be suggested to us by some other person. For example, someone says, "here comes so and so" and I actually seem to see in the figure approaching the person whose name has been mentioned. Emotion also tends to stimulate the imagination and to call up vividly certain mental pictures, so that it frequently gives rise to errors of perception. For example, fear calls up pictures of the various ills that may befall us and frequently makes us see threatening forms in the various indistinct shapes and lurking shadows that lie along our path. Binet relates that on the evening of the execution of Marshal Ney, several people were assembled in a Bonapartist room; suddenly the door opened and the servant mistaking the name of one of the arrivals who was called M. Maréchal Ainé, announced aloud: "Monsieur le Maréchal Ney." At these words, a thrill of fear ran through the gathering and those who were present afterward related that for an instant they distinctly saw, in M. Ainé, Ney himself advancing in person into the middle of the room. In this case, suggestion and emotion combined to call up in the minds of the assembled Bonapartists an image so vivid that it quite outshone, so to speak, the actual sensory impression of M. Ainé and they seemed to see the form of the ill-fated Ney advancing toward them.

But even these two factors will not deceive us for very long if combined with them we have not also an attitude of mind which leads us to unquestioningly accept our false impressions at their face value. If the average individual is constantly making errors in perception, he is also constantly correcting them. The timid per-

son walking along a lonely road at night, nerves himself to look more carefully at the threatening form in his path and perceives that it is only a bush or stump. The assembled people in the Bonapartist room, after one startled glance, gave the advancing figure a more searching scrutiny and saw that it was not, could not be Ney. It is only when people fail to maintain this critical attitude that they begin to go seriously astray. Now there are a number of causes which may inhibit the action of our critical sense so that we fail to correct our errors of perception. For one thing, there is the tendency to accept without question or further scrutiny, those impressions which are in harmony with our expectations and beliefs. If one thinks he sees on entering a room, a familiar figure, one he would expect to find there, he is likely to pass it by without a second glance and his false impression is therefore likely to remain uncorrected. Then again emotion, when it is strong enough, may completely inhibit one's critical judgment. An individual who is sufficiently afraid does not stop to question the reality of the apparition which in his terror he has conjured up out of his own imagination. His mind is so completely filled and dominated by his fear that, for the time being at least, there is no room in it for anything else. Finally, and this is perhaps the most important of all, the inhibition of critical judgment may be due to the fact that the individual does not wish to correct his error. His illusion is an agreeable one and so he hangs onto it for "there are none so blind as those who won't see." This goes a long way toward explaining why so many people who seem to be keen and intelligent are able to keep on deceiving themselves in the belief that at spiritualistic seances they see their departed loved ones or hear their voices. The spiritualistic trickster would have a very poor time of it if his dupe were not at the same time his confederate. As a matter of fact, in many cases, one might almost say that what the medium really does is not to deceive his victim but merely to give him the assistance he requires in order that he may deceive himself.

With this brief explanation of the processes which underlie certain forms of false perception, let us return to the man whose case we have been considering and see how he came to hear imaginary voices.

Early in adult life, he had begun to lose his hearing so that impressions produced by actual sounds had begun to grow more and more indistinct and he had in consequence come to depend more and more on memory and imagination as a means of supplementing them. Then, as a result of his ear disease, he had begun to hear

rumbling noises in his head and as his deafness increased, it became progressively more difficult for him to distinguish between these noises and the actual sounds and voices which came to him from without. So in course of time it became quite easy for him to mistake his head noises for actual sounds and to place upon them any interpretation which his imagination might suggest.

But, if his ear disease had produced a condition in which it was easy for his imagination to lead him astray, his mental habits and attitude of mind were such as to impell him to take full advantage of this condition. We have seen that he had for his own satisfaction, developed a belief in a supernatural power who was his friend and protector, that he had also sought to amuse himself by pretending that he had trances in which he saw angelic hosts like the people he had seen in "mesmeric shows." It was of a piece with all this make believe that he should also imagine that he could hear his friend the Spirit Doctor talking to him, saying the things that he himself put into his (the Spirit Doctor's) mouth. What more inevitable under these conditions, than that the head noises which to him probably did not sound so very different from actual sounds should suggest the sounds and voices which occupied such a prominent place in his thoughts and which he liked to imagine he could hear? As was to be expected, therefore, these imaginary sounds blended with the sensory impressions due to his ear disease so that he actually seemed to hear the things he imagined. But if his mental habits and attitude of mind were such as to give rise to imaginary sounds and voices, they also produced an uncritical credulous attitude which prevented him from correcting them. He had been for years cultivating a belief in the supernatural so that when at last his friend the Spirit Doctor seemed to speak to him there was little if anything in the experience which from his point of view was startling or improbable. There was very little in it to awaken doubt or incredulity in his mind. Moreover, the experience was a pleasing one and having no inclination to doubt the reality of that which was so agreeable to him, he accepted these auditory impressions at their face value.

So we see that the absurd beliefs which this man built up were developed because they satisfied demands of his nature which he was unable to satisfy in the world of reality and as for his absurdities of conduct, his visions and imaginary voices, we have seen that they were due to the same cause. They were the outcome of his false beliefs, his attitude of mind and the practise into which he had fallen of accepting the imaginary in place of the real whenever

it suited him to do so. This case then serves to show that our emotions and desires may warp our judgment, not merely in the comparatively mild degree to which we find these forces operating amongst normal individuals in everyday life, but also to the extent of producing those more bizarre types of false belief which we are accustomed to regard as manifestations of mental disease.

Having by means of an illustrative case, demonstrated the fact that our passions and desires may so warp our judgment as to give rise to most absurd delusions, let us pass on to consider the question of why these forces should play such an important part in determining our beliefs.

The human race has evolved to its present level by a process of natural selection and the characteristics which man has acquired in the course of this process have, for the most part, been developed because they were useful to him, because they helped him in the struggle for existence. This is as true of mental qualities as of physical; man has developed reasoning powers, a capacity for forming ideas, merely because these ideas were of practical use. It is to be expected therefore that he should have developed the type of mind which tended to produce the ideas or beliefs best suited to his needs. Now as a general rule those beliefs are best suited to our needs which conform most closely to the truth. For example, it is well for us to have as correct ideas as possible in regard to where and how food may be obtained or how to escape disease. Sometimes it happens however that the best belief for us is not the one which comes nearest the truth. For example, there have been occasions when a man has passed unharmed through great danger because he believed himself to be quite safe and so remained calm and unruffled, whereas if he had had a truer appreciation of his situation he would in his terror have precipitated upon himself the very evil he feared. It is of advantage to us then that we should be guided in our choice of beliefs not merely by the evidence which can be brought forward in support of them but by their utility, and this as a matter of fact we really are. The belief, for example, that after death people are rewarded for their good deeds and punished for their bad, owes its wide acceptance partly at least to the fact that it is felt to be of value to society, making people try harder to do right and serving as a deterrent for those who otherwise would be likely to commit antisocial acts. That our choice of beliefs is based partly at least on utility is also indicated by the arguments which people frequently offer in support of their opinions. For example, men arguing in favor of their religious convictions point out the

value of religion to the human race and the evil results which would follow if we were without it. Amongst physicians one not infrequently hears the argument advanced against a scientific theory that if accepted it would lead to "therapeutic nihilism," which shows a recognition of the fact that even in the field of science, utility should play a part in shaping our opinions.

But as a rule the process by which we shape our beliefs to suit our needs is not one of which we are clearly conscious; it is one that goes on, as it were, automatically. We find our judgment swayed this way or that by emotional forces which we frequently deplore and strive to hold in check but which nevertheless incline us toward opinions and beliefs that although they may be illogical are as a rule fairly well suited to our needs. Such for example is the tendency to see only what is favorable to oneself or one's party in any dispute, to believe one's own side entirely in the right and the other side entirely in the wrong. This tendency is constantly being deplored by earnest seekers after truth and yet it is a normal and necessary one as a little thought will show. Man in the struggle for existence must frequently engage in dispute and combats of one kind or another and no matter how just and fair he may wish to be, he cannot always have all the right clearly and indisputably upon his own side. If however he cannot enthusiastically believe in the justice of his own cause, he will neither be able to win adherents to it against an opponent who is keen and shrewd but sees things only from his own side nor will he be inspired to fight for it with that whole hearted vigor which is so essential to success. Shakespeare said, "thrice is he armed who hath his quarrel just"; he might have said, thrice is he armed who believes his quarrel just, for it is not the justice of our cause but our belief in its justice and our ability to convince others which gives us strength. And what is true in regard to the individual, is even more strikingly true in regard to the nation or race. In international disputes it is remarkable how firmly convinced everyone is that his own country is entirely in the right and the other country entirely in the wrong. Such an attitude of mind may be illogical but it is of great value from the standpoint of national strength, since without it there cannot be that spirit of unity, that patriotic fervor without which no nation could hope to hold its own against any but the weakest kind of an antagonist.

The tendency to accept those beliefs which are agreeable to us even when they do not lead to any course of action which is conducive to our welfare is also a useful one although here the advantages to be gained are not so apparent. To understand what these

advantages are, it is necessary that we should first have clearly in mind the significance of the struggle that man is always carrying on to achieve happiness and contentment.

Man has in the course of evolution developed appetites and instincts which impell him to satisfy his own needs and perform those acts which are essential to the preservation and welfare of the race. These appetites and instincts manifest themselves in consciousness in the form of desires, the desire for food, for physical comfort or personal safety, the desire to procreate, the desire to be of use in the world and to so act as to win the approval of his fellow men. Now although these appetites and instincts result in forms of conduct all of which are at times useful, it so happens that in the varied and complex situations of life they are constantly giving rise to impulses which cannot have free outlet, to desires which cannot be gratified. For example, the demands of the gregarious instinct, by reason of which man tends to seek the companionship of his fellows and to combine with them in many useful forms of activity, cannot be satisfied by one who is cast away on a desert island. In many cases, conditions do not absolutely cut the individual off from the means of gratifying a certain desire; they simply make it impossible to gratify it without thwarting some other desire which may be equally strong. For example, a mother may be unable to satisfy her desire for food without exhausting her meagre supply and thus thwarting her even stronger desire to feed her child; a man cannot gratify his desire to fight for his country and at the same time his desire for personal safety and comfort; frequently a man cannot satisfy the demands of his sexual instinct and at the same time his desire to conform to the ethical standards of his fellows. Now these desires which cannot or should not be gratified, not only serve no useful purpose, they are a positive detriment. Sometimes they lead the individual in his attempts to satisfy them to spend his energies in forms of activity which serve no useful purpose and which are even productive of serious harm. At times they hold him back from acts which he should perform as in the case of the man who is held back by his desire for personal safety from efficiently serving his country on the battlefield. At other times they do harm by obtruding themselves upon him, distracting his thoughts and so preventing him from fixing his mind upon those things which require his attention. This is seen, for example, in cases where sexual desires which cannot be satisfied give rise to erotic fancies which so dominate a man's mind that he finds it impossible to concentrate his attention upon his work.

Now if these appetites and instincts have been developed in the course of evolution because they serve a useful and necessary purpose, why is it that they are so poorly adapted to our needs and are continually pulling us in directions in which we should not go? If we pause to consider the matter for a moment we will see that it could not be otherwise. The situations of life show infinite complexity and variety and the things which it is necessary that we should strive for under one set of conditions are not at all the things we should seek when the conditions are somewhat different. The tendencies and desires therefore which under one set of conditions give rise to the type of behavior which the situation requires, are inevitably under certain other conditions only a handicap to us. The difficulties which result from this impossibility of having our impulses and desires suited to all the different situations of life is largely overcome by the fact that they are capable of undergoing a large degree of modification in order to bring them into harmony with what is desirable or possible of attainment in any of the various situations in which we may be placed. For example, if we cannot have companionship we can to a certain extent at least get over the longing for it; if we cannot escape from danger we can as a rule conquer our fear of it; and so on with all of our impulses and desires; none of them are absolutely rigid things; all are capable of being modified in a greater or less degree in order to bring them into harmony with the requirements and limitations of the various situations of life.

From what has been said we can see that our appetites and instincts impose upon us two tasks. First, the modification of the impulses and desires to which they give rise so as to make them conform to the requirements and limitations of the situations in which we are placed and, second, the gratification of those desires which can or should be gratified. In other words, our task is to make ourselves want only what we can or should have and this being accomplished our second task is to get what we want. Or still again, we must make our desires fit the requirements of the situation in which we find ourselves and our accomplishments fit our desires. When we have succeeded in fitting our desires to our requirements and our accomplishments to our desires we have succeeded in making what the student of abnormal psychology is accustomed to speak of as a satisfactory mental adjustment. As a rule, however, the steps by which the individual advances toward mental adjustment are not taken in the order given. On the contrary the usual order is quite the reverse. In the first place, the

individual seeks to gratify his desires, trying to produce harmony between desire and accomplishment by making accomplishment fit desire, and it is only when he finds this to be impractical that he resorts to the alternative procedure of modifying desire so as to bring it into harmony with what is possible of attainment.

Now from what has been said we are in a position to understand the significance of the struggle for happiness and contentment. A man is unhappy when his mind is troubled by some desire he is unable to gratify. Discontent is the manifestation of an unsatisfied want. To be contented is to be satisfied with what we have, to have our desires matched by our accomplishments. The struggle for happiness is therefore the struggle for mental adjustment, the struggle to produce harmony between desire and accomplishment, a process the value and necessity of which has just been pointed out. This state of mental adjustment or contentment, man is always striving to achieve by one of the two methods mentioned, namely, making accomplishment fit desire or making desire fit accomplishment. In every man's views in regard to life, in his philosophy or religion, one finds expressed a tendency toward one or the other of these types of reaction. The Stoics emphasized the importance of modifying our desires to fit our attainments. They laid stress upon the fact that it was not what we possessed that really counted so much as our attitude toward life. The religion of Buddha is also a philosophy of resignation, Nirvana being a state toward which man progresses as he rises superior to his desires. We find the same thing in the Christian religion in so far as it teaches patience and cheerful resignation in the face of sufferings and deprivations laid upon us by an all wise Providence. As an example of a philosophy which leads toward the alternative type of adjustment, we at once think of the Epicurean school since it taught the pursuit of happiness and the pursuit of happiness we tend to think of as the gratification of desire. This however is scarcely a fair estimate of Epicurean philosophy for if the Epicureans emphasized the importance of happiness, they did not teach that it was to be attained purely by the gratification of the appetites and desires. As a matter of fact, although mankind as a whole tends to seek satisfaction by gratifying desires rather than by checking or modifying them, there is very little tendency to incorporate a belief in this method of attaining satisfaction in our religions or philosophies. The man who seeks satisfaction by making conditions conform to his desires usually has his mind fixed on the concrete problem of how this result is to be attained. As a rule it is only

when we give up hope of finding satisfaction in material things that we turn to philosophy or religion.

In this connection, it is interesting to consider the part that the conditions under which we live play in determining our type of reaction. The tendency being first to seek adjustment by making accomplishment fit desire, it follows that those individuals or nations which are most fortunately situated and best able to satisfy their desires or mold conditions to suit themselves tend most strongly to seek adjustment in this way. It is the man who realizes that he cannot make conditions fit his desires who falls back on the alternative of making desire fit accomplishment. Thus it is that in old civilizations such as we find in the East, where people are crowded and there is but little for each individual, where they are bound down by rigid long established custom and feel themselves helpless to improve their condition; it is in such countries and under such conditions that they make their adjustment by fitting themselves to an environment they cannot change, while in new countries where there is room for expansion and plenty for all, where a man's place in the world and manner of life is not immovably fixed by established custom, people tend to seek satisfaction in achievement, in bending conditions to their desires. Hence in the West such philosophies have but little appeal. Religion, which impels people to turn from the world, appeals to those who have received but little of life. Preachers of all ages have realized this fact and have condemned wealth, prosperity and worldly pleasure as pernicious forces which weaken the bonds of religious faith. The individual when he is young, courageous, vital adopts a philosophy of achievement. He expects to find satisfaction in gratifying his desires, in moulding conditions to his will. The weak or timid, the less vital, the old man who has shot his bolt and can hope to get nothing more from life turns to a philosophy of resignation or to faith in another world for his satisfaction. In America today religious thought shows a marked difference from that of the old world. It has adapted itself to the impulse to achievement released by the opportunities in a new country by taking a greater interest in this world, teaching the doctrine of effort to make this world a better place to live in. American religious thought is more practical, leans more to achievement and less to mere spiritual comfort, than that of older countries where the possibilities of achievement are more limited.

From what has just been said about the tendency to shape our philosophy or religion to suit our needs it may be inferred that in our attempts to achieve contentment, to make desire and accomplish-

ment match, our beliefs play an important part, certain beliefs being of great assistance to us, others rendering successful adjustment difficult or even impossible. Let us now consider how our beliefs help us in this task, what types of belief we are therefore likely to find useful and, since our tendency is to accept the beliefs which are suited to our needs, what beliefs we are therefore likely to adopt.

In the first place, our desire for a thing depends largely on what value we place upon it. If we believe it to be of great worth our desire for it is much greater than if we regard it as of little value. It therefore follows that if we can bring ourselves to think poorly of those things which we cannot or should not have, we have gone a great way toward freeing ourselves from a troublesome and futile desire for them. We are therefore constantly building up beliefs which help us to overcome our desires in this way. The fox in the fable was able to lessen his desire for the grapes and therefore his dissatisfaction over not being able to obtain them by assuming that they were sour. The woman who is for one reason or another unable to marry, to have children and a home of her own is not infrequently able, partly at least, to overcome her desire for what she finds unattainable by magnifying the unpleasant features of married life, convincing herself that it is a slavish condition which she is fortunate in escaping. The poet or painter, denied the popularity which he craves, seeks to hold in check his desire for recognition by assuming a contemptuous attitude toward public opinion, cultivating the belief that it lacks discrimination and is unworthy of the consideration of the true artist. The poor man, unable to gratify his desire for wealth and the things which it will buy, seeks to hold his desires in check by sneering at the luxurious softness and the ostentatious display of the rich or philosophically reflecting, that added wealth brings only added burdens and responsibilities and that he is really happier and better off as he is. In fact there is not one of us who is not thus shaping his opinions as a means of regulating his desires in what is as a rule a necessary wholesome effort to adapt himself to the limitations of the situation in which he is placed.

Then again, the fact that desire is as a rule satisfied and ceases to trouble us when we believe that the thing we desire has been attained makes possible a second device for getting rid of troublesome desires. One has only to convince himself that things are as he would like them to be and the painful and futile desire which impelled him to struggle against the inevitable ceases to be a disturbing factor in his mind. So it is that we frequently get rid of our desires by adopting beliefs which satisfy their demands. The mother

whose son has been lost at sea desires that he shall be restored to her alive. The state of affairs for which she longs she cannot bring about but she is able to check her painful and futile desire by convincing herself that it is gratified, that somehow or other her son has escaped and will some day return to her. So with all of us in a greater or less degree, we seek to check our discontent and dissatisfaction, our longings that cannot be satisfied, by believing as far as possible that things are as we would like to have them. There is no doubt that this tendency plays an important part in determining our belief in a personal Deity and a life after death. We accept these beliefs, not on the basis of any evidence which can be brought forward in support of them, but because as we say we feel that these things are true. But whence comes this feeling? It comes from the need of such a belief and the normal tendency which exists in all of us to shape our beliefs in conformity with our needs. The desire for companionship in his loneliness, for protection against the various ills that beset him, man is able to satisfy in a greater or less degree by means of a belief in a personal Deity, an all wise Father who ever stands beside him, supporting and protecting him in all the hardships he must face. The desire for self preservation, so strong in all of us, the desire to meet again our loved ones who have passed away is allayed and satisfied by belief in a life beyond the grave. The reality and universality of this desire for survival for ourselves and those we love and the demand for a belief that will satisfy it is shown by the tendency, when people depart from the old established religious beliefs, to take up with spiritualism or some other teaching that satisfies the same demand in a somewhat different way.

Closely allied to the tendency to believe that things are as we would have them, is the tendency to believe they will be so at some future time. A man can endure present deprivation if he feels that his desires are to be gratified in the future. Hope saves us from the pain of longing which we cannot gratify and enables us to go on cheerfully in present unsatisfactory conditions. We therefore tend to hold our desires in check by assuming that some time things will be as we want them, that some day we will be rich, some day our work will receive recognition or some day in a life beyond the grave we shall have the satisfaction and the joys which are denied to us in this.

Since emotion and desire play such an important part in determining belief, why is it that we do not all of us drift entirely away from the truth, each one building up for himself a system of fanci-

ful ideas based upon his own individual requirements? It is because amongst the demands of our nature which draw us now this way, now that, there are always powerful tendencies at work which make for sound thinking. It was pointed out earlier in this article that man is frequently unable to gratify one desire or emotion without thwarting another which tends to draw him in the opposite direction: that, for example, he cannot satisfy the desire to serve his country on the battlefield without thwarting the opposing desire to remain safe and comfortable at home. Now our conflicting emotions and desires not only impell us toward opposite forms of conduct but also toward opposite forms of belief. For example, suppose a person we love does something that makes us very angry. Our anger will impell us to put the worst possible construction upon his behavior but our love will impell us to make excuses for him. The opinion to which we finally come will depend, other modifying influences being excluded, upon the relative strength of these opposing tendencies. And it is the same with most if not all of our thinking. We are constantly being acted upon, not merely by one but by several emotions and desires which pull different ways: so although in every one of us there are forces which if unopposed would lead us sadly astray, there are also counter tendencies which pull in the opposite direction and as a rule hold us in the path of sound thinking. Let us consider rather briefly the more important of these forces which serve to keep us from going astray.

In the first place, we are constantly being kept from going off the track by concern for our own best interests or the best interests of our fellows. In many situations, where a man is drawn by some emotion or desire to accept a belief which is at variance with the facts, he is able to see that this false belief would not in the long run best satisfy his desire for his own ultimate welfare or the welfare of his fellows and so he is impelled to reject it. Such is the case of the man who in some national crisis where prompt and vigorous military action is required, is drawn by his love of peace and comfort toward the view that there is no real danger which would justify plunging the nation into war; he finds however that his love of country and his desire for the safety and well being of his own home will not let him deceive himself with any such agreeable fallacy, that on the contrary he is driven to accept the unpleasant truth that a war is necessary. So it is that in many of the varied situations of life, man is impelled by his own desires and on purely utilitarian grounds to accept the unpleasant truth rather than turn aside into the comfortable bypaths of false belief.

A second force which tends to keep us from going astray is the love of truth for its own sake. This love of truth is no doubt largely the result of habit. Man is constantly seeking knowledge which will help him to satisfy his needs and in so doing he tends to acquire accurate habits of observing facts and of reasoning for them. Then as he finds truth to be useful and necessary and spends his effort in search of it, he inevitably comes to place a high value upon it and to regard it as something desirable for its own sake. Most of our beliefs being from motives of self interest constructed as far as possible in conformity with the facts, we tend in building them to develop correct habits of reasoning and a desire for the truth which has an effect on all our processes of thought. The habit of correct thinking like every other habit constitutes a definite force. It is something with demands which must be gratified. Man is probably born with an instinct of curiosity which impells him to find out things, which gives him a desire for truth, but this desire may be strengthened by habits of clear honest thinking until it has to be a very strong desire which will drag him far away from these established habits of thought. It is for this reason that men whose lives have been spent in the pursuit of knowledge are apt to be the most honest in their thinking. Dealing with broad principles and impersonal matters, they have most strongly developed clear and honest habits of thought which serve to check the inclination to accept an untruth, merely because it is agreeable. For this reason there is less tendency among scientific investigators, men whose lives have been spent in seeking after truth, to have the judgment warped by the emotions than amongst poets, painters, journalists or writers of fiction, men whose lives have been spent largely in seeking and giving expression to those ideas which have a strong emotional appeal. Hence the conflict which has always existed between the scientific type of mind which bases its beliefs on facts and clear logic and in them seeks to gratify a desire for the truth, and the artistic mind which bases its beliefs largely on intuition and in them seeks to gratify a variety of emotional demands. For the most part, the general public will always tend to accept the beliefs of the artistic type rather than of the scientific because most people's demands are more akin to those of the artist than those of the scientist and his beliefs satisfy in a greater degree their emotions and desires.

A third factor which helps to keep us straight in our thinking is found in the gregarious instinct, the tendency to follow the example of our fellows in both thought and behavior. The average human being is as unwilling to think alone as he is to live alone. In his

beliefs as in all else he tends to go with the crowd. The bolder and more aggressive individual, it is true, will develop opinions of his own but he is not as a rule happy in them unless he can share them with others. He may argue in favor of his beliefs and try to get a following to go along with him but if he fails to accomplish this, nine times out of ten he will in the end forsake his independent ideas and turn back to follow his companions along the beaten trail of conventional belief. Now this gregarious tendency is one of the greatest forces in existence for checking the inclination which exists in all of us to develop absurd and unwholesome ideas either as a result of defective logic or from some emotional cause. We cannot find satisfaction in any opinion however attractive that leads us away from the herd. We tend to accept only the beliefs that our fellows will share with us and this keeps us from going far astray since for a belief to receive general acceptance it must as a rule have a wide appeal; it must be fairly well adapted to the needs of those who accept it and beliefs that are found satisfactory by the great bulk of humanity are as a rule wholesome; they have stood the test of wide experience and even if in certain cases they are not altogether logical they are apt to be pretty well suited to our requirements.

But although as a rule the forces which tend to keep us in the path of right thinking are stronger than those which would lead us astray, it sometimes happens that the reverse is the case. This, of course, is not surprising when we remember that man's emotions and desires vary not only according to the tendencies which he has inherited from his ancestors but also according to his state of health and the various conditions or circumstances in which he may be placed. Let us consider the causes which may alter the relative strength of these forces and also the effects which such changes may have upon our beliefs.

When the forces which make for sound thinking do not predominate over those which would lead us astray it is either because the former are unusually weak or the latter unusually strong or because these two factors exist together. Let us consider in the first place the cases in which the forces which tend to lead us astray are unusually strong. Sometimes it happens that the individual is swayed by an emotion or desire which he finds himself unable either to gratify or suppress and which may constitute a force so powerful as to outweigh regard for the truth, the opinions of his fellows or any of the other influences which under ordinary circumstances hold in check our tendencies to depart from the path of right think-

ing. Sometimes the force which warps his judgment is a mere transitory burst of passion which dominates him for a short time and then passes, leaving the forces which make for sound thinking again in the ascendency. Such is the case of the man who is subject to very sudden and violent outbursts of temper which cause him in defiance of common sense and the opinions of those about him to make and believe the most absurd charges against the object of his rage. In such cases the anger soon passes, the forces which make for common sense again assume control of the situation, and the absurd beliefs disappear. People of violent and poorly controlled emotions are constantly having their judgment warped in this way. Such people however do not as a rule go very far astray in their thinking. The passions which warp their judgment may be very powerful while they last but they are soon spent; they do not last long enough to carry the mind very far into the byways of false belief. The man whose judgment is swayed by gusts of emotion is much like a ship that is being constantly driven off its course for short distances by sudden squalls. Such a ship may never be off its proper track for long at a time, although it steers a very erratic course.

But there are other cases in which the individual is dominated by some passion or desire which does not pass quickly but continues year after year over a long period of time. Such strong and unremitting passion of course is only possible where there is very serious disharmony in the individual's emotional life, where there is some deep rooted desire which he is unable to satisfy or suppress. Such an emotion or desire may constitute a force so strong as to outweigh the forces which make for right thinking, leading the individual to adopt unsound beliefs because in them he finds a certain amount of emotional relief. Such is the case of the woman whose son has been lost at sea and who desires with such intensity to have him restored to her that in spite of clear evidence to the contrary she adopts the belief that he has escaped somehow and will eventually return home. False ideas which develop in this way are of course likely to become permanent. The emotions which give rise to them may continue over such long periods of time as to produce impressions in the mind which do not become obliterated even when the emotions die which produced them but continue on as permanent and life long beliefs.

Let us now consider those conditions in which a man may go astray because the forces which make for sound thinking are unusually weak. In the first place it may be that owing either to bad mental habits or an inherited defect a person is lacking in that love

of truth and clear thinking which as was pointed out ordinarily helps to keep us from going astray. As there are people who practise little self restraint and who are always shaping their conduct in accordance with their impulses and desires, so there are people whose self indulgence shows itself in a disregard for clear thinking and a readiness to accept whatever belief the impulse or desire of the moment may suggest. Such people, because of their disregard for the truth, are unstable in their beliefs and are constantly being swayed by their emotions, now this way, now that, just as people who have no regard for sound standards of conduct are constantly allowing themselves to be carried away into wrong courses of action. If a person of this type does not drift far away from the beaten pathway of accepted belief, it is merely because his gregarious tendencies, his inclination to keep close to his fellows, is strong enough to prevent him from doing so; he holds to the beaten track because he lacks the courage and independence to venture off of it by himself, not because he has any standards or ideals to restrain him; he would be quite willing to take the easy path rather than the straight one, provided there were enough people travelling along it to keep him from feeling lonely or afraid. Now such a person, although he may never go very far astray, will always, like the man of sudden violent passions, steer an irregular course. He will always in his beliefs be wobbling to this side or that as impulse and desire lead him. He may not go far astray on what we might call the fundamentals; in fact his interests are likely to be too narrow for him to concern himself much about broad principles, but he will be forever going wrong on the little things, looking at them only from the standpoint of his own interest and twisting logic and facts to please himself.

In the second place, a man may be rendered more liable to go astray by the fact that in him the gregarious tendency is weaker than in the average individual. There are certain people who are very independent and self reliant in their thinking; they do not follow the crowd; they think things out for themselves and stick to their own opinions whether others agree with them or not. Now a readiness to hold to one's own beliefs in the face of popular opinion is no doubt indicative of a certain strength and sturdiness of character and when it is combined with sound judgment and good emotional balance may carry with it distinct advantages. If Columbus had not been a man who was ready to back his own judgment against the current beliefs of his time he would never have discovered America and if Galileo, Newton, Darwin and a host of others

had not had the self reliance to hold opinions which differed from those of their contemporaries, science would never have made much progress. Unfortunately, however, a readiness to go one's own way in opposition to popular belief is not necessarily accompanied by wide knowledge, sound judgment or mental poise and if by striking off from the beaten path a man runs a chance of hitting upon something of value, he also takes a risk of getting lost in a wilderness of false beliefs. The man who goes with the crowd may never add much to the fund of human knowledge but on the other hand he never goes far astray. When a person's emotions and faulty judgment carry him away into a maze of unwholesome and extravagant fancies it is not infrequently because his morbid tendencies are not sufficiently held in check by the inclination to go with the crowd, to tread the pathway of generally accepted belief. Frequently of course it happens that when a man develops beliefs which run counter to those of his fellows it is not because he is by nature inclined to disregard the opinions of others but because his manner of life is such that the influence of public opinion cannot reach him. A man for example who under ordinary conditions would be most orthodox in his opinions may develop peculiar ideas if obliged to live alone on a desert island because here he is entirely removed from the modifying and restraining influences of public opinion. A man cannot be expected to make his beliefs conform to those of his fellows when he has no fellows to whom he can make them conform. The same thing is true in a somewhat lesser degree of the man who for one reason or another has drifted into solitary habits. He does not converse with people, he perhaps reads very little and so he knows almost nothing of what people think or at any rate he does not come into sufficiently close touch with people and their ideas to be much influenced by them. Therefore, although perhaps not inclined to be self opinionated, his mind tends to follow its own bent and to lead him farther and farther away from the beliefs of his fellow men. In this connection one might call attention to the importance from the standpoint of mental hygiene of taking care that the individual during the early formative years of childhood and adolescence does not drift into solitary habits. Such habits are unwholesome because they deprive the individual of normal means of emotional outlet, thus causing him to seek satisfaction in less desirable ways, and also because they cut him off from the corrective influence of human intercourse so that his morbid tendencies are allowed to develop unchecked.

Now one thing is clear from what has just been said and that is

that no sharp line of distinction can be drawn between the normal and the abnormal. There is no one whose judgment is not being constantly warped by his emotions; there is no one whose beliefs are altogether true or altogether suited to his needs. The forces which give rise to slight defects of judgment are in many cases at least essentially the same as those which give rise to the most extravagant delusions and we pass by imperceptible gradations from those whose judgment is regarded as unusually sound to the most pronounced and obvious cases of so called mental disease. How far astray a man will go in his beliefs will depend largely on how far he is dominated by those forces which tend to lead him away from the pathway of right thinking. As a rule, an impulse or desire which tends to lead a man astray will only carry him so far when some opposing tendency will come into play of sufficient strength to counterbalance it and prevent him from being carried any farther away from his course, in this direction at least. For example, take the case of the man whose life is rendered miserable by the fact that he cannot refrain from worrying about his health. This leads him to take up Christian Science and to adopt the belief that there is no such thing as physical disease, that what we regard as such is merely "error." In this belief he finds comfort, for, by convincing himself of the unreality of all disease, he is able successfully to combat the tendency to worry over his own physical condition. His mind is therefore set at rest and he is both happier and healthier in consequence. But if he were to take this belief he has adopted as a means of attaining comfort and satisfaction and were to follow it to its logical conclusion, he would altogether cease to care for his health or to protect his body against injury since obviously if physical suffering and disease have no real existence, there is no point in taking pains to protect oneself against them. I have however never heard of a Christian Scientist who carried his peculiar doctrines to this their logical conclusion. He may be impelled by a desire for the comfort and peace of mind which they bring, to develop his absurd ideas up to a certain point but here the appetites and instincts which impell a man to care for his physical comfort and well being come so strongly into play as to prevent him from carrying them any further.

But although counter tendencies are usually called into play to prevent us from carrying our false beliefs beyond a certain point, such is not always the case. Sometimes what happens is quite the reverse; the individual having once gotten off the track of right thinking, the forces which tend to lead him astray gain strength,

those which heretofore have been holding him to his right course are weakened and so he continues to drift farther and farther away from it until, unless some new influence is brought to bear upon him, he entirely loses himself in a maze of absurd delusions. Such, for example, may be the case of the man who is impelled by some strong desire which he cannot satisfy to indulge in absurd beliefs but is restrained therefrom chiefly by regard for the opinions of his fellows. Should the morbid tendencies in such a case once gain the ascendancy and the man begin to develop false beliefs, it may well happen that these beliefs will have the effect of making him withdraw from the society of his fellows and adopt an unwholesome solitary manner of life. When this happens, as it not infrequently does, it not only shuts the individual off from certain of the normal channels of emotional outlet, thus increasing his tendency to seek satisfaction in abnormal ways, but it also cuts him off from the influence of public opinion by which his morbid tendencies have hitherto been held in check. The forces which make for wrong thinking having once gained the ascendancy, would therefore in such a case tend to remain in control and unless some new force were called into play to combat them, to carry the individual farther and farther away from the normal. So we see that if some people go farther astray in their thinking than others, it is, in many cases at least, due merely to a difference in the relative strength of the various tendencies by which our thoughts are shaped. All our beliefs, whether normal or abnormal, are, to a large extent at least, the resultants of the various conflicting emotional forces to which we are subjected and the relative strength of these forces depends in the main on a variety of causes such as heredity, early training and the various difficult situations in which the individual may be placed, causes the importance of which men have more or less clearly recognized in all ages even although they may have been unable to construct scientific theories which would account for the facts they observed.

Now, glancing back over the course of this article, we see that man's tendency to shape his beliefs in conformity with his emotions and desires serves a useful purpose and is not to be regarded as in any sense an abnormality or defect, even although in certain cases it leads him sadly astray. We can best understand the human mind if we look upon it as a complex piece of mechanism developed in the course of evolution to produce those forms of thought and conduct which are essential to the welfare of the individual and the preservation of the race. Like all Nature's mechanisms, the human mind

has its limitations; it is not without flaw. The forms of thought and conduct to which it gives rise are not perfectly adapted to the purposes they meant to serve. Nearly always they could be improved upon and sometimes, owing either to unusual difficulties in the situation or to defects in the mental mechanism itself, we get reactions which are so unsuited to the individual's requirements, which depart so far from what is usual or desirable that they are regarded as manifestations of some underlying disease process and various theories are advanced to account for them. The fact is we are so accustomed to see the mind react in a fairly adequate way to the demands made upon it that we are surprised and mystified when it fails to do so. Really, however, the strange and wonderful thing is, not that sometimes the mental mechanism fails to rise to the requirements of the occasion, but that in the infinitely varied and ever changing situations in which we are placed it should so uniformly react with forms of thought and conduct which are adequate to our needs. The remarkable thing is, not that it fails us sometimes, but that it fails us so seldom.

It might perhaps seem that, since our emotions so frequently lead us astray, it would be better for us if our thinking were not influenced by them. However, when we take into consideration the limitations of the human mind, the fact that our reasoning processes must necessarily be imperfect, there can be little doubt that we would fare much worse if our beliefs were built up by a process of logic which did not take into consideration our needs or desires. We are all of us familiar with those ideas to which unbiased reason not infrequently seems to lead, ideas which are entirely unsuited to our needs and which will not work out in actual practise. Such ideas not infrequently appeal to the mere theorist but the average man very properly refuses to have anything to do with them, and turns instead to those beliefs which, although perhaps neither logical nor consistent, are more in harmony with his requirements. And although man's emotions and desires so often warp his judgment, it would seem that they are nevertheless in the course of his social evolution, really leading him toward the truth by a path which is safer and surer than he would have to follow if guided by logic alone. The opinions which the individual holds, he has not for the most part built up himself. They are opinions he has found current amongst his fellows and adopted as his own. These current beliefs which we all accept to a greater or less degree are not the work of one man or even of one generation. They constitute an edifice which has been many centuries in the building.

Before the birth of civilization man sought to construct ideas which would fit the facts of experience, which would help him to live. During the ages that have followed, each succeeding generation has worked on the same task, not building entirely afresh but taking the beliefs already in existence and modifying or adding to them. Men have been continually discarding this or that idea as they found it inadequate and replacing it with some other which seemed better fitted to their needs. From age to age the old beliefs have undergone modification to fit them to new situations which have developed, new facts which have been brought to light. We have, to use our former figure of speech, an edifice of generally accepted belief which is forever being altered and expanded to keep pace with our continually changing needs and ever widening experience. In the final analysis, the only test of the truth of any idea is, does it fit the facts? We may legitimately infer that in developing our beliefs to fit a constantly increasing variety of needs, an ever widening field of experience, we are bringing them into closer conformity with the facts and therefore nearer to the truth. In short, we are developing in the course of our social evolution, mainly as a result of our efforts to satisfy our needs, a system of beliefs which as time goes on approaches nearer and nearer to the truth.

ON THE VISCOSITY OF THE CEREBROSPINAL FLUID

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INTRODUCTION

The cerebrospinal fluid has been studied by great many workers from various viewpoints—physical as well as chemical. In spite of the efforts of the workers, a number of questions still remain unsettled. Especially concerning the viscosity and its relation to various constituents of the fluid little has been known.

Levi-Valensi (1) studied this problem in the hope of using it for diagnosis, but the result was negative. The viscosity was shown almost to be equal to that of distilled water, and it had no noticeable relation with either the number of lymphocytes, or the quantity of the globulin.

The above statement greatly interested the writer, because it is a well known fact that the viscosity of a protein solution increases a great deal with the concentration. How can the controversy between Levi-Valensi's findings and the known fact concerning the viscosity of the protein solution be explained?

Sachur (2) and Hardy (3) studied the effect of alkalies, acids and inorganic salts upon the viscosity, and, from their data, it would seem, that the alkalinity influences viscosity to a remarkable degree.

Therefore, it seems to the writer, that the viscosity is not only influenced by the protein but other substances in the spinal fluid which would change the effect of protein on viscosity. It must also be taken into consideration that the presence of cells in the fluid makes it a heterogeneous system.

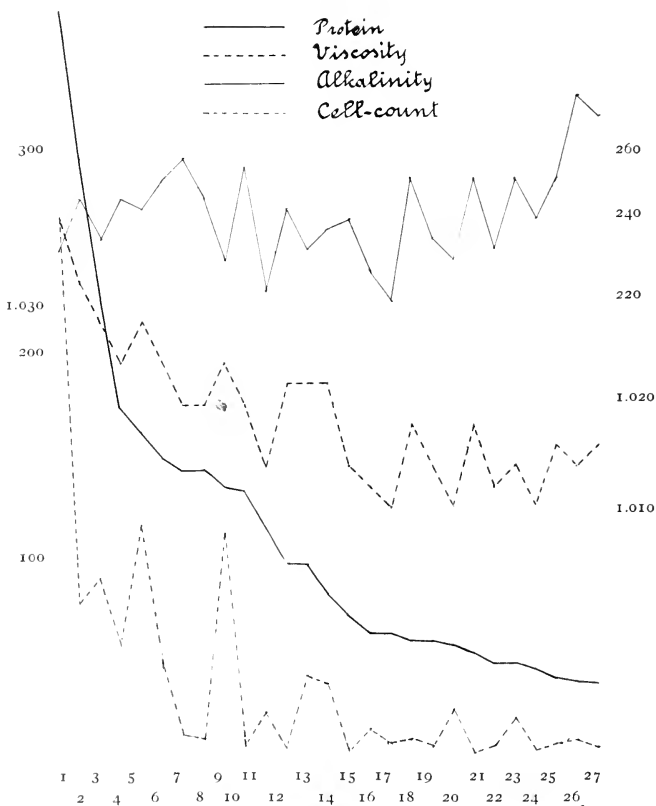
In the present experiment, several constituents are quantitatively determined, in the hope of finding the effect of some particular constituents upon the viscosity of the spinal fluid.

The constituents estimated are as follows: Protein, total nitrogen, chloride, inorganic phosphate, alkalinity and the number of cells.

PROCEDURES

The cerebrospinal fluid was taken into a sterilized test tube and immediately tested. Care was taken that all samples should be perfectly clear and free from blood.

Protein: Was estimated by means of a nephelometer. The method has been thoroughly described by Denis and Ayer (4) so the precise technique will not be repeated here, but as in this experiment the process was somewhat modified to adapt it to the apparatus available, a brief description will be given: 1 c.c. of standard protein solution (50 mgs. per 100 c.c.) is diluted to 3 c.c. and then 1 c.c. of 10 per cent. sulphosalicylic acid solution is added, the whole being diluted to 10 c.c. A suitable quantity of the spinal fluid is treated in the same way. Since the Nissl tube is used to centrifuge off the protein in the determination of the chloride, the suitable quantity of the cerebrospinal fluid can be roughly estimated from



the amount of the protein precipitated. The amount of protein in mgs. per 100 c.c. of the spinal fluid is given in the table.

Alkalinity: Following Levinson's method (5), 1 c.c. of the spinal fluid is diluted with 20 c.c. of distilled water and titrated by $N/100$ sulphuric acid, methyl red being used as the indicator, until a pure pink color is obtained. In the table the results are expressed in c.c. of $N/100$ sulphuric acid per 100 c.c. of the spinal fluid.

Total Nitrogen: Folin's technique (6) for the estimation of non-protein nitrogen in blood is employed, using 0.5 c.c. of the spinal fluid (without removing protein).

Chloride: The method proposed by Myers and Short (7) for the estimation of chlorides in the blood is used slightly modified. The following is the procedure: 2 c.c. of the spinal fluid is introduced into a Nissl tube with 1 c.c. of Esbach's reagent. The tube is centrifuged for 15 minutes, and then 2 c.c. of the supernatant solution is pipetted out into a small Erlenmeyer's flask and mixed with 5 c.c. of a ferric alum indicator (prepared according to Myers and Short). To this mixture, 15 c.c. of silver nitrate solution (1 c.c. of which corresponding to 1 mg. of NaCl) is added, the flask is whirled until silver chloride flocks out, and the remaining silver nitrate is titrated back with ammonium thiocyanate solution (2 c.c. of this corresponding to 1 c.c. of the silver nitrate solution). The following formula will give the amount of chloride in terms of chlorine:

$$\left(15 - \frac{\text{Titer in c.c.}}{2}\right) \times \frac{3}{4} \times \frac{35.5}{58.5} \text{ mgs. chlorine in 100 c.c.}$$

The amount of protein in the spinal fluid is estimated by Nissl's method in this laboratory, as a part of routine work the procedure was adopted for two reasons; one of sparing the spinal fluid, the other of roughly estimating the amount of protein which make the nephelometric estimation very easy. Esbach's reagent has no different effect than picric acid on the determination of chloride. That the direct back titration of silver nitrate gives the correct result has been tested titrating pure sodium chloride solution, of a known concentration.

Whitehorn (8) has also recently asserted the accurateness of this procedure.

Inorganic Phosphate: Bell and Doisy's method (9) of the colorimetric estimation of phosphate in blood was applied to the cerebrospinal fluid with a little modification: 1 c.c. of the spinal fluid is introduced into a test tube, and then 2 c.c. of molybdic acid solution and 1 c.c. of 2 per cent. hydroquinone solution are added. After 5

No.	Case No.	Protein	Total N	Cl	P ₂ O ₅	Alkalinity	Cells	#	Gold Test	Wassermann	Diagnosis
1	22750	362	59.5	442	2.85	232.5	201	L.038	5555555300	Positive	General paralysis
2	22755	289	48.2	435	2.4	245	73	L.032	5555555540	"	"
3	22679	222	38.9	427	2.6	235	85	L.028	5555421000	"	"
4	22675	168	—	432	3.25	245	53	L.024	5555551100	"	"
5	22678	157	—	461	—	242.5	111	L.028	5555555511	"	"
6	22665	144	31.1	—	3.3	250	42	L.024	5555555410	"	"
7	22709	138	30.6	437	3.1	255	9	L.020	5555321000	Negative	Unclass organic brain disease
8	22670	138	—	448	—	245	7	L.020	5555555541	Positive	General paralysis
9	22773	130	—	455	2.7	230	107	L.024	5555432100	"	"
10	22665	128	—	428	2.9	252.5	3	L.020	5555554100	"	"
11	22656	109	—	441	2.4	222.5	20	L.014	5555510000	"	"
12	22731	92.5	25.4	450	2.75	242.5	2	L.022	5555431100	"	"
13	22767	92	22.9	450	2.8	232.5	38	L.022	5555443100	"	"
14	22656	78	41.0	—	3.55	237.5	34	L.022	5555511000	"	"
15	22661	67	—	429	2.6	240	1	L.014	L112221100	"	"
16	22777	59	21.4	—	2.35	227.5	12	L.012	5554411000	"	Cerebral syphilis
17	22693	58.5	25.9	435	2.25	220	5	L.010	0000000000	Negative	General paralysis
18	22739	55.5	—	495	2.8	250	7	L.018	1111000000	"	Manic depressive insanity, depress.
19	22666	55	—	449	2.5	235	3	L.014	0001110000	"	Dementia precox, paranoid
20	20733	53.5	21.0	454	2.9	230	21	L.010	0001211000	"	Alcoholic psychosis
21	14216	49.5	—	460	4.7	250	0	L.018	1100000000	"	Cerebral syphilis
22	22044	41	17.0	418	4.8	232.5	3	L.012	0001111100	"	Traumatic psychosis
23	21997	44	16.8	437	4.4	250	17	L.014	0012110000	"	Mental deficiency with epilepsy
24	22654	41.5	—	436	—	240	1	L.010	0111100000	"	Dementia precox, catatonic
25	22658	36.5	21.6	431	2.4	250	4	L.016	0122222000	"	Manic depressive insanity, manic
26	13207	35	24.4	479	2.7	270	6	L.014	0002110000	"	Dementia precox, paranoid
27	22691	34	15.2	427	5.2	265	2	L.016	1111100000	"	"

minutes, 10 c.c. of carbonate-sulphite solution is added and thoroughly mixed. Into two test tubes, 1 c.c. and 2 c.c. of the standard solution is introduced respectively and treated in the same way as the spinal fluid.

The standard solution is prepared by diluting 4 c.c. of the stock solution (5.6226 grs. of K_2HPO_4 dissolved in 1000 c.c. of water which contains 1 mg. of P in 1 c.c.).

After 5 minutes all are made up to 15 c.c. with distilled water, and the color developed is compared with the suitable standard.

A small amount of protein in the spinal fluid is precipitated when molybdic acid is added, but it dissolves on adding carbonate-sulphite solution and has no effect materially on the color developed.

Pure molybdic acid is used instead of ammonium molybdate in this experiment, in order to avoid the smell of ammonia gas which arises when carbonate-sulphite solution is added to ammonium molybdate solution. The acid solution is made as follows: 7.2 grs. of molybdic acid is dissolved into 49 grs. of concentrated sulphuric acid by means of heat, and hydroquinone solution and carbonate-sulphite solution are made up according to Bell and Doisy. The amount of P_2O_5 is calculated from the following formula:

$$\frac{\text{Reading for the standard}}{\text{Reading for the unknown}} \times \frac{4}{3} \times \frac{71}{31} \text{ mgs. } P_2O_5 \text{ in 100 c.c.}$$

Viscosity: Ostwald's viscometer of ordinary type was used. This delivered about 2 c.c. of pure water in 83.0 seconds. The temperature of the fluid is kept at $37^\circ \pm 0.1^\circ$ by immersing the viscometer in a thermostat.

The average of five determinations is taken as the result. As the specific gravity of the spinal fluid is low and varied very little, the viscosity is expressed, because of its simplicity, by the ratio:

Transpiration time of the fluid (t'), that of water (t).

The last figure of this ratio given in the table is not said to be very accurate, but may be available for comparison of individual cases.

EXPLANATION OF THE DATA OBTAINED

Protein: The amount of the protein was generally increased in cases of general paralysis (varying from 59 to 362 mgs. per 100 c.c.), and these spinal fluids, showing an increase of protein invariably showed a positive gold test.

In most of the other psychoses which were examined in this investigation the protein content was lower than that of general paralysis, the lowest being found in dementia precox, paranoid.

Total Nitrogen: Total nitrogen was found to vary from 15.2 to 59.5 mgs. per 100 c.c., but similar variation did not always accompany the amount of protein.

Chloride: Calculated as chlorine, is within the range of 427-479 mgs. per 100 c.c. (702-790 mgs. as NaCl), and there seems to be no definite relation between psychoses and the amount of chlorides. There seems to be no relation between the protein concentration and the amount of the chloride.

Landau and Halpern (10) found an antagonistic relation between chloride and total nitrogen, but the data obtained do not seem to lead to the above conclusion.

Inorganic Phosphate: Donath (11) determined the amount of phosphate in the cerebrospinal fluid, and found 0.0026 to 0.0508 per cent. P_2O_5 ; Apelt and Schumm (12) also studied the same subject employing a similar titrimetric method to that used by Donath, and they found 0.005-0.0074 per cent. for general paralysis, 0.0091 for uremia, 0.0016 and 0.0018 per cent. for epilepsy and tabo-paralysis.

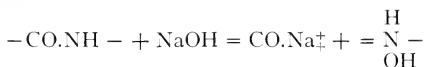
The present study showed 2.4 to 3.55 mgs. P_2O_5 per 100 c.c. for general paralysis, 5.2 mgs. for dementia precox paranoid, 2.25 mgs. for manic depressive. Comparatively small amount of phosphate was always found in cases of general paralysis.

Viscosity: Is varying from 1.010 to 1.038 and seems clearly different from that of water (which is assumed to be 1.000). Generally speaking, the viscosity of the spinal fluid of general paralysis cases is increased, most of them being above 1.020. However, there are few exceptions (No. 11 and No. 16) and sometimes other psychoses give close comparative values to them (*e.g.*, No. 7, No. 18, No. 21). In this manner, although the viscosity of the spinal fluid might prove to be diagnostic aid in addition to other tests, no definite significance can be obtained from this alone.

Effect of Protein: We see from the table that there is an apparent tendency toward increase of the viscosity with increase of protein. This relation will be seen more easily when represented graphically (see diagram). The amount of protein and the viscosity are given on the ordinates, and cases arranged in decreasing order of protein content on the abscissas. Though the protein and the viscosity curve show roughly a parallel course, the occasional deviations upset the complete parallelism of the two. These deviations are too marked to be ascribed to the observation error. The viscosity of the spinal fluid does not seem, therefore, to be governed by the concentration of protein only. How can these deviations be explained?

Effect of Alkalinity: As stated in the introduction, it is a known fact that the viscosity of the protein solution is influenced by alkalinity to a certain extent, and this might explain the difficulty we met above. Therefore, another curve of alkalinity is drawn side by side to see whether or not there is any relation between them. The curves of viscosity and alkalinity show a remarkable similarity, especially in the right half of the diagram, where the protein content is uniformly low, decidedly indicating that the alkalinity influences the viscosity.

Sackur (2) and Hardy (3) are of the opinion that viscosity of the protein solution is to be ascribed to the protein ions. According to Robertson (13) the protein ionizes in the presence of alkalis as follows:



(NaOH will be supplied by hydrolysis from sodium carbonates which is fairly abundant in the spinal fluid.)

Hence, according to the law of mass action, by increasing the concentration of NaOH the reaction will proceed to the right hand side, more protein ions being produced; and as the result increase of the viscosity will follow. The writer believes, therefore, the deviation of the protein and viscosity curve could be explained, to some extent, by the consideration of the alkalinity present.

But on the other hand, Sackur (2) and Hardy (3) have shown that the viscosity of protein solution has a maximum at a certain concentration of alkalis. The former author employed 0.58 per cent. casein solution and found the maximum to be between 0.0149 and 0.0218 *N* of NaOH, the latter used 0.62 per cent. globulin solution in which the maximum occurred between 0.002 and 0.01 *N* of NH_3 .

In the spinal fluid when the alkalinity and the viscosity appear to be parallel the protein is found to be less than 0.06 per cent., and alkalinity fluctuating about 0.024 *N*. From the above data, we may say that the spinal fluid has much excess of alkali compared with the amount of protein; and in such a case, according to Sackur and Hardy, a decrease of viscosity should accompany an increase of alkalinity. This conclusion seems apparently to contradict the data observed in the spinal fluid, and would seem to make the explanation given above untenable.

Since, however, the concentration of protein employed by Sackur and Hardy is much larger than that of the spinal fluid, the writer

thinks that this explains the chief cause of non-existence of the maximum viscosity in the spinal fluid.

Hardy (3) noticed that the maximum was less marked in lower concentrations of protein. If we assume that the above relation holds in regard to the spinal fluid, then at such a low concentration of protein as in the spinal fluid no maximum would be noticeable and the viscosity would increase with the alkalinity.

Above 0.15 per cent. concentration, as shown in the diagram, the alkalinity seems to have a tendency to lessen the viscosity, and it seems to agree with Sackur's and Hardy's results.

Effect of Cells: The number of cells found usually increases when the concentration of protein is high, and their effect upon viscosity must be taken into consideration. It is known that the suspended particles effect the viscosity. Einstein (14) proposed the following formula: $\eta' = \eta(1 + K)$; Hess (15), $\eta' = \eta(1 - aK)$; Hatchek (16), $\eta' = \eta/(1 - K)$, η' standing for the viscosity of the suspension, η for that of the suspension medium, and K for the total volume of the suspended particles in a unit volume of suspension and a for a constant. All these formulae claim an increase of the viscosity of the fluid with the increase of the particles suspended in it. Therefore, the number of cells is plotted along the viscosity curve in the same diagram. The two curves run apparently parallel when the protein concentration is high, indicating that the presence of many cells might influence the viscosity.

Hence whether or not the viscosity of the spinal fluid at high concentration of the protein is influenced by alkalinity or by the cells is hard to decide.

The writer, however, is inclined to accept the latter view for the following reason:

As is seen in the diagram, in some cases in which the concentration of the protein is relatively high, the decrease of the viscosity is accompanied by the decrease of the alkalinity while in other cases the increase of the former is accompanied by the decrease of the latter. In spite of the little change of protein in these cases the alkalinity and viscosity show a reverse relation (see No. 9 and No. 11 in the diagram). In these cases the number of cells were greatly varied, some showing enormous increase while others decrease. It would seem, therefore, rather reasonable to attribute the effect of the cell element in these particular cases.

Chloride and Viscosity: As a comparatively large amount of chlorides is present in the spinal fluid, some effect of chlorides on the viscosity is naturally to be expected. Nevertheless no notice-

able definite relation could be found between the amount of chloride and the viscosity, probably because the individual variation of the chloride is too small to show the effect.

The other constituents which were not estimated here might influence the viscosity to some extent, but the chief influences seem to be attributable to the protein, alkalinity and the cells.

SUMMARY

1. This paper presents a study of viscosity and various constituents of spinal fluid.

2. An increased viscosity is likely to be found in cases showing a high concentration of the protein.

3. The viscosity seems to be influenced chiefly by protein content, less, but to a noticeable degree, by alkalinity and the number of cells.

4. Other constituents, which were not estimated in this study, may influence, but probably play only a minute part.

5. The diagnostic value of the viscosity is rather doubtful, although it could be of use when combined with other tests.

The writer is greatly indebted to Drs. J. B. McDonald, superintendent, and S. Uyematsu, pathologist of Danvers State Hospital for their valuable assistance in preparing this paper. To them the writer wishes to express his gratitude.

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Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

THE THREE HUNDRED AND EIGHTY-NINTH REGULAR MEETING
HELD AT THE ACADEMY OF MEDICINE

MAY 3, 1921

The President, DR. FOSTER KENNEDY, in the Chair

RESOLUTIONS ON THE DEATH OF DR. CLIMENKO

At a regular meeting of the New York Neurological Society, held at the Academy of Medicine, May 3, the following resolutions, drawn up by the committee comprising Dr. I. Abrahamson, Dr. I. Strauss, and Dr. I. S. Wechsler, were duly passed by the Society. It was resolved to send a copy of the same to Mrs. Climenko and to preserve a copy in the archives of the Society.

HYMAN CLIMENKO

1873-1920

Hyman Climenko was born in Russia. He received his preliminary education in that country, having attended the "Gymnasium," a secondary school, up to the time he emigrated to America in 1890. Economic necessity forced him to discontinue his studies for a time, but he subsequently resumed them and finally entered Long Island Medical College in 1900, being graduated from that institution in 1904.

After a period of training at the Montefiore Home he went into general practice, but kept up his neurological studies by associating himself with Dr. Joseph Collins at the Post Graduate Hospital and later at the Neurological Institute. About ten years ago he was appointed adjunct visiting neurologist to the Montefiore Home, later chief of clinic at the Mt. Sinai dispensary, and shortly before his death adjunct neurologist to the Mt. Sinai Hospital and full visiting neurologist to the Montefiore Home. He was a member of numerous medical societies, among them the New York Neurological Society. He was a member of the Academy of Medicine and two days before his death was elected chairman of the section of neurology and psychiatry of the academy.

Dr. Climenko's death came as a sudden shock to all his friends. He had been in perfect health when he was taken ill with an acute abdominal pain. The condition was diagnosed as acute intestinal obstruction, he was immediately operated upon, but he failed to rally from the shock and died within three days from a very severe toxemia. He is survived by his widow and five children.

Hyman Climenko was an able physician and an excellent neurologist. He was rapidly rising when his untimely death put an end to the fond hopes of his friends and his own aspirations. Since 1908 and up to shortly before his death he contributed forty papers on neurological subjects. A short list of titles includes Anterior Poliomyelitis, Familial Optic Neuritis, Tumors of the Brain and Cord, Dystonia Musculorum, Infantilism, Syringomyelia and Leprous Neuritis, Corpus Luteum in Neurological Practice, Lethargic Encephalitis, etc. His work combined scholarship with accuracy of observation.

Hyman Climenko was a most lovable man. He had a very big heart. He was a true and devoted friend, literally had no enemies, and was ever kind and considerate to the feelings of others. He was essentially modest, so that he never made a strong first impression, but close acquaintance quickly revealed the sterling man that was in him. Beside his medical activities he showed great interest in liberal social and literary movements. In him the New York Neurological Society lost a valuable member and an unusually diligent and industrious worker.

DR. FOSTER KENNEDY wished to say a word of how much he had enjoyed knowing Hyman Climenko. He was a very gallant fellow, a happy fighter against large odds, an intellectually honest man.

Climenko possessed also a quaint and whimsical humor, and enjoyed nothing better than to be lightly chaffed himself. He was a very lovable and a very real person, and Dr. Kennedy felt that the Society had suffered a great loss in his untimely death.

A PSYCHOGENIC STUDY OF EPILEPSY IN A CHILD

DR. L. PIERCE CLARK: Since epileptoid seizures, observed in psychoneurotics as early as the time of Westphal, have been favorably influenced by psychotherapy, the same method has been tried on essential epilepsy. Essential epilepsy, however, is not a neurosis but is organic in origin and the results have not been good. Cases appear, nevertheless, in which psychogenic factors so clearly overlie other causative agents that the question arises whether these trends may not be of prime importance in etiologic and therapeutic consideration.

The personality makeup of the epileptic child removes him so far from natural development that ordinary adjustments are impossible. Coincident with grand mal seizures many epileptics show psychopathic episodes. While these are related to their defective personalities as a whole, they are not directly related to the seizure

episodes themselves, yet when these are immediate forerunners or may in themselves constitute imbricated attacks or petit mal, they are of greatest moment.

The case described is that of a boy, now five years old, who at the age of two and a half, eight months after the birth of his younger brother, had attacks which were for the most part conscious. He began to clench his fist and grimace, ending in laughing and crying. A year later the symptoms became more severe until the attacks were not only unconscious but ended in classic grand mal. A very active child, nervous and irritable from birth, of neurotic and high strung parentage, he from the first was jealous of his brother. Two types of attacks were noted, one the ordinary grand mal. About two thirds of his severe seizures are preceded by laughing or puffing attacks. The boy suddenly stands quite still and breathes or puffs as one might on entering a cold bath. The lips are drawn back and upward giving a leering expression. The smiling contraction of the lower face has the suggestion of animal snarl. The eyes do not screw up but have a vacant, fixed, far away gaze; the pupils dilate and are unresponsive to light for the eight or ten seconds of the attack. On one occasion when put to bed after several puffing attacks he had two minor attacks in rapid succession following displeasure. When he wanted to get up and was restrained, he threatened to have another. Instead of the usual puffing attack he merely leered and threw his arms and legs about in utter abandon. The following night while asleep he began drawing in his breath in stertorous gasps: his limbs were in tonic spasm, then clonic, and finally movement ceased as in a fairly severe grand mal. The latter would seem to have started as an ordinary puffing attack and gradually shaded over into a moderately severe grand mal. He did not waken after the attack, and felt quite well next morning. Two nights later he had a complete grand mal attack which also began as a respiratory or leering episode. A few weeks later, when annoyed, he simulated an attack, but it was a poor imitation and he admitted the hoax. Tantrums and an increasing number of nocturnal attacks, both puffing and grand mal, together with wishing spells of very childish nature followed.

Since he was showing increased fatigue, irritability, and more attacks both mild and severe, it was concluded that his effort at attention in school was too intense and he was placed upon a less taxing routine. Improvement was at once apparent, but whenever any unpleasant task was imposed he would start puffing and blowing. He has admitted that he encourages the attack by these actions, that this as well as the peculiar attack itself made his "stomach light" as though he were "floating." He would not say the acts were pleasurable but said they gave him relief. After a time his school work was good and he did well in his daily routine. He said he did no more puffing now "because things were going all right and he didn't need to." Whenever the routine becomes irksome the tantrums, or attacks, or wish episodes, would occur. Apparently the

conscious puffings are employed to while away the general tedium of life or displeasure states that are to be abreacted. The act is usually conscious at its initiation and if persisted in becomes an unconscious laughing crying attack and, if this is not controlled or aborted, after two or three of them have occurred the whole episode may end in a classic grand mal.

Remarkable improvement has been noted in the past four months. Tantrum episodes rarely appear, and evidences of a desire to retreat from reality in his wish fantasies and in puffings are eliminated, the grand mal has been absent now for over four months. The retreat, or displeasure mechanism, was apparently first employed at the birth of his brother when his mother's attention was diverted from him. The boy shows the grand mal epileptic in the making, and that the disorder is based upon a defective epileptic anlage of constitutional origin. The personality uses the defective instinct of adaptation for its own ends,—a conscious and unconscious retreat from reality, which is proportionate to the stress demand.

DR. SMITH ELY JELLIFFE said that he agreed absolutely with Dr. Clark. He wished we could have more studies of this type. Observations from day to day, training, morale adjustments, all are important and we should be in a better position to treat the kinds of attacks that are usually lumped together under the title of epilepsy.

DR. CLARK said that the personality of the little boy had undergone a remarkable change in the course of his observation. His physiognomy and voice, manner of walking, have all changed. It was thought previously, by his family, that he was not so different from other children, but with his improvement they are surprised that they did not see his shortcomings before. The difficulty now encountered is that of injecting the boy into his home environment when his course of treatment is completed. Transplantation into a different family may be necessary for a number of years. Even though the relatives might be trained and think that they understand the situation, they would nevertheless react to family type.

EPIDEMIC ENCEPHALITIS SIMULATING BRAIN TUMOR

DR. IRVING J. SANDS: These cases presented all the general signs of brain tumor, such as headache, choked discs, hemiplegia, and vomiting of the projectile type. In two of the cases reported operation had been decided upon but permission for operative interference was refused, in one instance by the patient herself, and in the other by the patient's parents. The third case terminated fatally. The cases were from the psychopathic service of Bellevue.

Case 1 was that of a boy of twelve, of negative family, and of normal personal history. In June, 1920, he began to show apparent loss of interest in his surroundings, with awkwardness in the use of the left hand. He then began to show a steadily increasing paralysis of the left side of the body, with choked discs, first in the right and later in the left eye. The paralysis later spread to

the right side of the body, the paralysis in each instance being at first of the flaccid, and later of the spastic, type. He lost control of his sphincters. He also experienced difficulty in swallowing at first solid and later liquid food. The mental picture was that of indifference. This, however, was apparent only, as the patient seemed to respond to questions, and his answers were relevant and coherent, and his emotional reactions adequate and consistent. Serological examinations excluded syphilis, and showed a type often seen in epidemic encephalitis cases. Permission for operation was refused by the parents. Patient began to recover in the middle of September, 1920, and was discharged from the hospital in the middle of November, 1920. He was last seen in March, 1921. He had returned to school and was getting along fairly well except that he was quite readily excited and irritated, and would fly into rages of temper. Emotionally he was unstable. Physically he showed the residuals of an old left hemiplegia, with very slight haziness of the right disc, and there were definite involuntary choreo-athetoid movements in the fingers and hand of the left side on voluntary motion of any other part of the body.

Case 2 was that of a forty-two-year-old married woman, of negative family and personal histories. In the middle of February, 1921, she began to complain of general malaise, headache, and of a slight cough. On March 1st, she suddenly took to her bed, refused to talk, and would see no one. In the hospital she showed evidence at first of a right hemiplegia, with choking of the left disc. Later the process extended to the right side of the brain producing greater choking in the right than in the left disc, with hemorrhage in both discs. Subsequently she showed considerable meningeal irritation. Serology was negative for syphilis. X-ray of the skull was negative. Her mental picture was that of steadily increasing drowsiness, lack of attention, and inability to answer questions. She lost control of her sphincters, and regurgitated even liquid food. She died on April 14. Necropsy permission was refused.

In case 3, the patient from the very beginning of her illness showed evidence of a growth in the right side of the brain, giving a left hemiplegia with elevation of the right disc. Serology excluded syphilis. She had periodic attacks of headache, nausea, and projectile vomiting. Her mental picture was characterized by marked irritability and confusion. The physical signs pointed so strongly toward a cerebral neoplasm that epidemic encephalitis was not even considered as a diagnostic possibility, and she was transferred from the psychopathic service for operative interference. She refused permission, and began to improve, so that she was finally discharged from the hospital after a residence of ten weeks showing practically no physical residuals of her illness, and mental signs of irritability and lack of concentration.

DR. SANDS referred to the works of Bramwell, Barker, and Tilney and Howe, as evidence of the fact that changes in the discs in cases of epidemic encephalitis were not the usual things encountered, and choked discs were indeed rare findings in this disease. He

explained the choked disc on the theory that there was pressure on the supraoptic canal of Tilney, rather than by the usual theories such as the toxic theory of Leber or the mechanical theory of Schmidt-Rimpler.

DISCUSSION

DR. SMITH ELY JELLIFFE recalled a case which he had considered one of brain tumor until Dr. Kennedy pointed out to him that it was encephalitis lethargica. The epidemic encephalitis cases with distinct brain tumor history were thus cleared up. In still another case the picture was one of fractured base of the skull. The patient had fallen on the first day of illness, blood was found on cerebrospinal puncture, and the physicians were sure of fracture. The illness pursued a regular encephalitis course and cleared up very gradually.

Dr. Jelliffe said that he had enjoyed Dr. Sands's paper, especially since it brought the syndrome into focus. It was time that we should have pointed out to us that it was possible.

DR. I. ABRAHAMSON called attention to the fact that the course of the disease was essentially different in encephalitis and in cerebral neoplasm. Even the papillitides in both conditions had different onsets and different rates of progressing. Left hemiplegia in a right handed individual with aphasia indicated multiplicity of the lesions.

In encephalitis, mental signs were very common, quite marked, and occurred early in the disease. In brain tumors they were less evident and usually were found late in the disease or where much internal hydrocephalus existed, the exceptions being chiefly temporo-sphenoidal neoplasms. He cited the case of a girl aged twelve years, with optic neuritis, paraplegia at first left and later right sided; at first flaccid, then spastic, then flaccidity plus tremors, coincident with return of power in the extremities; bulbar involvement, blood Wassermann + + + +, spinal fluid negative; encephalitis lethargica was finally diagnosed.

Another case of a young woman, with markedly choked discs 4-5 dioptries: hemiparesis, ocular signs, etc.: history of a pigmented mole on the left leg, infected and removed; then a gland removed from the left groin, diagnosed as a melanocarcinoma.

The differential diagnosis of metastatic carcinoma of the brain and an encephalitis lethargica was decided in favor of the latter, and so the autopsy showed.

The importance of the mental states of patients with lethargic encephalitis had to be constantly borne in mind, in making a differential diagnosis.

DR. PHILIP R. LEHRMAN said that he had seen the first of Dr. Sands's patient in July. The child then showed more mental complications than physical. There was evidence of some brain affection. The case was not further studied at that time.

DR. KENNEDY remarked on the interesting feature of the papilledema, its suddenness and lateness in the course of the disease.

It appeared over night. The maximum was reached in twenty-four hours. Such speed of progress is not seen in any other condition. The vision was obscured with scotomata. It had not been easy to discriminate between tumor and encephalitis.

The type of encephalitis described by Dr. Sands is new, though it is not appearing in any quantity. It is often associated with infective states. It seems to be a phenomenon of these times, and is possibly a condition following the influenza epidemic.

DR. SANDS, in closing, said that while these cases were clinically different from the typical epidemic encephalitis cases encountered during the epidemic, he felt that they were caused by the same organism. As a matter of fact, the clinical pictures of epidemic encephalitis that have lately been reported are quite different from those reported two years ago, and yet one would not hesitate to declare them to be caused by the same organism. In studying these cases, the mental picture is a great aid in arriving at the correct diagnosis. The apparent symptoms must be differentiated from the real ones. While these patients seem to be in a state of lethargy, on closer observation they are quite keen and responsive to questions. In brain tumor cases, on reaching such an apparent or real state of lethargy, the patient would never be able to respond to questions and to cooperate for an examination as readily as in cases of epidemic encephalitis simulating cerebral neoplasms.

Current Literature

VISCERAL NEUROLOGY

2. ENDOCRINOPATHIES.

Stenvers, H. W. THE PATHOGENESIS OF ADIPOSO-GENITAL DYSTROPHY.
[Nederlandsch Tijdschr. voor Geneeskunde, 1920, IX, 45.]

Stenvers records three cases of adiposo-genital dystrophy which showed evidence of dilatation of the third ventricle with a normal pituitary body. The first was a case of basilar impression in a girl of seventeen who had signs pointing to a pituitary or a parapituitary lesion, together with marked adiposo-genital atrophy. She died a few hours after operation, and on necropsy the basilar impression was found: the upper cervical vertebra had pushed upwards and invaginated the base of the skull; there was no tumor anywhere, and the pituitary was normal both macroscopically and microscopically; the walls of the third ventricle were thinned, and the infundibulum almost entirely destroyed. The second case was a woman of twenty-one who had amenorrhœa but little or no adiposity; the latter peculiarity is attributed to her greater age. Radiography showed a greatly enlarged sella in the antero-posterior direction, while the hindmost part of the sphenoidal sinus was dim owing to a protrusion of the sella floor into the sinus. Bad vision and fundus changes. Palliative trephining in the occipital region; three months later radiography as before. Necropsy showed a large right temporal lobe tumor; the third ventricle much dilated, but less than in case 1; cerebellum squeezed into foramen magnum. The walls of the sella were only slightly dilated. Pituitary macroscopically and microscopically normal. The third case is a boy of fourteen, still living; it is noteworthy, for by radiography the dilatation of the sella has been seen to progress *pari passu* with the trophic disturbances. He has a tumor of the posterior fossa. In June, 1917, vomiting, especially after eating, headache, and vertigo; two months later severe abdominal pains, swollen abdomen and sluggish bowels. Unsteady gait. Left field of vision greatly limited; lower of left optic disc badly defined. Horizontal nystagmus to right and to left. Left corneal reflex just perceptible. Slight weakness of right motor fifth and seventh. Slight bilateral acoustic neuritis. Left palate weak. Feeble abdominal reflexes; positive left Oppenheim. Hypotonia of left side, left-sided weakness and ataxy, left dysdiadococinesia. The condition has progressed and bilateral optic neuritis has appeared. In August, 1919, a great change—definite adiposity, breasts show inclination to feminine type, pubic hair absent. Ra-

diography, too, shows a great change, *i.e.*, a large shadow in hindmost part of sphenoidal sinus, due to the dilatation of the third ventricle, the floor of the sella having sunk into the sinus (figured). This dilatation of the ventricle was not present a year previously (figured); the trophic disturbances have accompanied the ventricular dilatation. Stenvers concludes from his observations that his previously reached conviction is strengthened, *viz.*, that adiposo-genital dystrophy occurs owing to a lesion of the third ventricle, no matter how the latter makes its appearance, whether by a pituitary tumor or by general increase of intracranial pressure. The adiposity was pronounced in cases 1 and 3, but nearly absent in case 2 (the woman of 21); the age of the patients seem to have been the determining factor, for it is known that adiposity appears earlier and more easily in children than in older subjects. (The paper is illustrated by radiographic diagrams and by full-length photographs.) [Leonard J. Kidd, London, England.]

Kuijjer, J. H. X RAY TREATMENT OF PITUITARY TUMORS. [Nederlandsch Tijdschr. voor Geneeskunde, 1920, LXIV, H 2, 1871 (7 figs.).]

Kuijjer brings before the Netherlands Surgical Society the results of the treatment of five unselected cases of pituitary tumors by x rays. From six to eight points of entry for the rays were used, *viz.*, on root and tip of nose, above eyebrows, outside outer canthi, and under the eyes; along these fields the rays were directed towards the sella. Treatment was divided into several series. The first case, a man, 23, had adiposo-genital dystrophy, headache, vomiting, vertigo, and almost complete blindness; five series given over a year; temporary diminution of headache and somewhat improved vision, but death three weeks after the last series. The second case, a woman, 52, had headache, congestion, slight speech disturbance, and very bad vision; four series, nine months' treatment; loss of headache, congestion, and speech troubles, vision became fairly good. Case 3, a woman, 49, had fatigue, vertigo, nausea, very bad vision, right eye blind, has been operated on elsewhere five times. Five months' treatment in three series; loss of general symptoms, and visual improvement. Case 4, a woman, 40, pains in limbs, headache, bad vision, amenorrhoea, slight genital dystrophy; four months' treatment in three series; loss of general symptoms, can read smallest letters and do all her housework. Case 5, a man, 26, bad vision, headache, left exophthalmos, and impotence; two months' treatment in six series; loss of general symptoms and of exophthalmos, much better vision, does all his work as teacher, but his impotence remains. The writer concludes that this treatment favorably influences both the general and the local symptoms of pituitary tumors; while the destroyed tissues are permanently lost, those which are merely pressed on may recover their functions. He finds that in those cases which have been successfully treated by x rays the sella shows the same changes of its shape as

it did before this treatment. He thinks the method is worthy of trial in other cases of pituitary lesions. [Leonard J. Kidd, London, England.]

Rees, M. H. INFLUENCE OF PITUITARY ON ABSORPTION OF WATER. [Am JI. Phys., August, 1920.]

Subcutaneous injections of pituitary extract, according to these experiments, seem to bring about a delay in the absorption of water from the small intestine. This delay does not account entirely for delay in the kidney excretion of water which has been found to result from these injections. The possibility is put forward that the subcutaneous injection of pituitary extract causes vasoconstriction of the vessels of the intestine.

Berkeley, A. N. THE PINEAL GLAND. [Med. Rec., January 3, 1920.]

The author here repeats what others have observed that the pineal gland does not atrophy with the oncoming of puberty. It retains throughout life a fairly definite size and any function it may possess in infancy is probably not altogether abrogated in adult years, as Krabbe, Schlesinger, Jelliffe and others have abundantly shown. It is an organ of internal secretion. In a succession of tumors of the pineal glands, the symptoms have been similar. Signs of cerebral tumor in the region of the corpora quadrigemina, concurrent with abnormal growth of the body, early appearance of axillary and pubic hair and remarkable sexual and mental precocity are grouped definitely as the "pineal syndrome" of Marburg and Frankl Hochwart. Preparations of pineal gland, obtained fresh from calves and young cattle, accelerated the somatic growth of kittens, rabbits and guinea pigs to a marked degree. A number of backward children, without organic stigmata, to whom the gland was administered for from three to six months, made an advance in mental age considerably in excess of any previous progress for a like period. [Denied by Goddard, who followed the same children.] Glandular deficiencies often do not come singly, and pineal gland therapy must often be combined with other secretions. A dry skin, cold extremities, obstinate constipation, excessive mental hebetude, irregular and imperfect eruption of the milk teeth and low blood pressure may necessitate the addition of thyroid. When the physical, as well as mental, growth is retarded and there are changes in the size of the sella turcica, or increased carbohydrate tolerance, great obesity or a systolic blood pressure below 50 mm., the anterior or middle lobe of the pituitary, or both, should be added. When the patient is a boy and has minute and soft testes, testis should be given. Sometimes several of these conditions coincide and a pluriglandular formula, all in minute doses, may be tried. The author believes that pineal gland will ultimately become a standard remedy for speeding up the sluggish cerebral chemistry of many backward children. The cases must be selected with reasonable care, perma-

nent organic damage to the child's brain being an absolute contra-indication.

Sacco, A., and del Valle, Delfor. SARCOMA OF THE PITUITARY. [Revista de la Asoc. Médica Argentina, April-June, 1920.]

A woman of 28 was suffering from a pituitary tumor which these observers removed. It was a round cell sarcoma. She was restored to active life, free from symptoms during the nine months since, except a glycosuria which developed after the operation. Menstruation had not returned after the birth of a healthy child, and left frontal headache developed. At the third year the hands and feet began to be large and she had attacks of vomiting.

Abel, J. J., and Nagayama, T. PRESENCE OF HISTAMIN OF PITUITARY. [Jl. Pharm. and Exp. Ther., June, 1920.]

Fresh gland infundibular extract contains a small but detectable amount of histamin. Extracts such as are employed in therapeutics often contain larger quantities of histamin. In one test approximately 2 gm. of histamin were present in eighty 1 c.c. phials of commercial extract.

Beck, H. G. HYPOPHYSEAL DISORDERS AND FROEHLICH'S SYNDROME (DYSTROPHIA ADIPOSO-GENITALIS). [Endocrinology, April-June, 1920.]

Were it not for the fact the operations on the hypophysis are dangerous, the mortality rate being from 10 to 16 per cent., the indications for surgery would be comparable to those for thyroid disorder. The complete removal of the gland or any process which totally destroys the substance will lead to cachexia hypophysopriva, hence operations are restricted to tumors largely and are resorted to in conditions associated with hyperfunction. Rather than to the more numerous types of hypofunction.

Hamant, A., and Caussade, L. ACROMEGALY OF LATE ONSET. [Rev. Méd de l'Est., May 1, 1920.]

The patient was 53 years of age and had had three children. The first symptoms were enlargement of the hands and feet. These had appeared at the time of the menopause, which had occurred about the age of 48-49. Later the skin of the face and neck grew thick. Deformities of the trunk, affection of the internal organs, and signs of compression were absent. Enlargement of the sella turcica was pronounced.

Bauer, J., and Aschner, B. DIABETES INSIPIDUS. [Wien. Arch. für inn. Med., June 1, 1920.]

The metabolic findings in a typical case of diabetes insipidus are here recorded for a woman who has been under observation for ten years.

There may be various causes for the disease. In some cases some abnormality in the kidneys or in their innervation is responsible. In others—and this is the larger group—it may be traced to changes in the vegetative synaptic stations in the floor of the fourth ventricle. Some primary disturbance in the pathways for thirst perception may be involved, in connection with the subcortical diuresis zones, possibly from irritation from concentration of crystalloid substances in the tissues. On the whole, conditions may be of psychogenic origin. A fourth possibility, that the disease is the result of abnormal conditions in the pituitary, has not been positively established to date. Even with loss of the diuresis regulating property of the pituitary secretion, normal compensating processes in the kidneys may ward off diabetes insipidus. Even if the pituitary be involved by definite structural changes the psychogenic factors are not excluded as dynamic.

Jacobson, C. HEMODYNAMIC REACTIONS OF CEREBROSPINAL FLUID AND HYPOPHYSEAL EXTRACTS. [Bull. Johns Hopkins Hosp., June, 1920.]

Human and bovine C. S. F. in concentration gives, when injected into other animals, physiologic reactions identical with those obtained from the use of various tissue extracts. These effects in the author's opinion are due to the presence of histamin. Definite evidence of a pressor substance in the C. S. F. from posterior lobe secretion is unknown. The pituitary gland does not give its secretion into the ventricles or into the C. S. F. Pituitary gland extracts show great variability on intravenous injection. They show a depressor effect. In general the authors conclude: (a) Anterior lobe exhibits depressor effect mainly. (b) Posterior lobe exhibits a moderate depressor followed by a specific pressor effect. (c) Pars intermedia had a small depressor, followed by a pressor effect. (d) Whole gland shows a neutralization of the depressor and pressor effects. (e) The posterior lobe secretion, if it is a specific secretion, is most probably produced in the pars intermedia and finds its way into the pars nervosa. The posterior lobe extract on intravenous injections appears to have an antidiuretic rather than a diuretic effect. Glycosuria is produced by intravenous injection of posterior lobe extract in a number of cases.

Steiger, M. RÖNTGEN RAY TREATMENT OF PITUITARY TUMORS. [Schw. med. Woch., June 24, 1920.]

The author has compiled the reports of twenty cases from the literature in which the pituitary was systematically exposed to the röntgen rays, all with definite indications of success. A woman of 32 who for seven years had had occasional headaches and for the last four years there had been impairment of vision in the right eye and for a year and a half in the left, is here described. The headaches had become more and more severe, spreading to the forehead, orbits and finally back of

the nose. Acromegaly was beginning and the sel'a turcica was large. The right disc was atrophied, this eye being blind; the left had vision of 0.06 after correction, 0.15 before. The röntgen rays were applied in crossfire from seven fields, for fifteen minutes each, from the brow, temples and anterior fontanel. By the second sitting vision was materially improved. Fourteen exposures were made in the course of four months, and vision constantly improved in the left eye and the right was able to recognize objects. A year later the acromegaly had almost completely subsided, but menstruation had not returned. The author thought that pituitary feeding might be added to advantage.

Pouliot, L. OBSTETRIC PITUITARY TREATMENT. [*Médecine*, April, 1920.]

Since pituitary extract has so strong a contractile power on unstripped muscular tissue, any mechanical cause impeding delivery is a contra-indication to its use. To give more than 0.10 gm. of the fresh gland is dangerous. Intramuscular or subcutaneous injection are the proper methods of use. The dose should not be repeated unless the action of the first is exhausted, allowing a two hour interval.

II. SENSORI-MOTOR NEUROLOGY

2. MID-BRAIN.

V. Monakow, C. ADDITION TO V. ECONOMO'S TREATISE ON ENCEPHALITIS LETHARGICA. [*Schweizer Archiv. f. Neurol. u. Psychiat.*, 1920, Vol. 6, No. 2, p. 293.]

V. Monakow fully recognizes a certain independence of the disease which v. Economo, doubtless, was the first to describe and adds some remarks of histopathological nature. From his examinations of cases belonging to this group he places the point of origin of the pathological changes in the veins of the brain stem which are situated near the base. These changes are certainly most pronounced in the floor of the third ventricle, in the central gray matter of the aqu. sylvii, in the form. reticularis of the brain stem (region of the nuclei of the eye muscles), and he considers these veins as the starting point of the disease processes. On serial sections at a certain distance from the small disseminated extravasations of blood, infiltrated vessels, glia proliferations, accumulations of white blood cells, products of decay, etc., described by Economo, it was easy to discern in some of the medium sized veins white stratified thrombi, which were continued in smaller branches. The vessels thickly infiltrated with lymph cells, etc. (accumulations of swarms of lymphocytes in the adventitial sheaths) are usually the central continuation of these thrombosed veins. The congestion, in the author's opinion, is a secondary phenomenon specially conditioned by the white thrombi. The same is true of the capillary extravasation. In the brain tissue immediately surrounding the thrombosed veins there are zones of reaction

with accumulation of amoeboid glia cells, products of decay and the like. From an histopathological point of view the main difference between the encephalitis lethargica and encephalitis of influenza, which makes its appearance more in the form of lesions, is set forth. V. Monakow had observed many cases in the epidemic of 1889 and still possesses microscopic preparations of some of them and states that in the influenza encephalitis the white inflammatory thrombi which stand in connection with the pathological changes of the blood colonize in the large arteries, especially in the cerebrum, and condition extensive necrotic lesions. In encephalitis lethargica, on the other hand, the thrombi are likely to be found in the veins (of the brain stem), causing phenomena of congestion together with changes in the ependyma and in the choroid plexus. As the affection extends to the capillaries and parenchyma a varied histological picture is presented (often without coming to actual necrosis of the tissue). In this form of encephalitis the cause of the processes is probably an excess of CO_2 and in the other encephalitic type to deficiency of blood containing oxygen. [J.]

Demole, V. MYOCLONIC LETHARGIC ENCEPHALITIS PREDOMINANTLY UNILATERAL. DELIRIUM TREMENS AT ONSET. [Rev. Méd. de la Suisse romande, 1920, June, p. 354.]

A carter, 50, mentally feeble and alcoholic, had malaise, vertigo, and shocklike contractions in limbs, followed by increasing fatigue and delirium. On admission he gave the picture of a delirium tremens: agitation, titubation, disorientation in time and space, but with retention of autopsychic orientation, tremors, visual hallucinations, pyrexia and sweating. His delirium was "professional," turned on horses, etc. In five days all this quickly ceased. Then he had tremors of tongue and of hands, especially the left, somnolence and lively reflexes; also involuntary pronation and supination movements of left arm, and rythmical contractions of abdominal muscles and diaphragm at rate of 20 to 26 a minute. The abdominal myoclonus began always on the left half of the abdominal wall. The somnolence increased but the myoclonus became less frequent and slower (10 a minute) a month after the onset. A slight touch on the skin of the left half of the abdomen gave immediately a contraction of the left abdominal muscles, followed directly by contraction of the right. This sensory zone (Th. 10-11-12) is slightly hyposthetic. The umbilical cutaneous reflex is abolished. The spinal fluid showed lymphocytosis, hyperalbuminosis, the presence of globulins, and a positive Noguchi reaction. Recovery about seven weeks after the onset. [Leonard J. Kidd, London, England.]

Briand, M. MENTAL DISTURBANCE IN ENCEPHALITIS LETHARGICA.

[L'Encéphale, 1920, July 10, Vol. 15, p. 481.]

Having previously called attention to forms of encephalitis with hallucinatory delirium and extreme excitement the author here continues his description of this type of cases. These patients are sometimes semi-conscious and in a state of great anxiety, sometimes unconscious or confused with states of agitation alternating with periods of intellectual torpor. They are at times so violent that by their movements of defense they constitute a danger for those about them. The zoopsic hallucinations and the ambulatory oneirism lend these cases a resemblance to the picture of subacute alcoholism, while the violence recalls the confusional state following epileptic seizures or the delirium of rabies. In these cases the diagnosis of encephalitis lethargica is established by the physical signs, fixed facies, painful muscular spasms, algesia, choreiform movements, prickings and itchings, ptosis, diplopia, pupillary inequality, dysarthria, constipation, retention of urine, vomiting, abolition, exaggeration, or dissociation of reflexes. One case of hypomania has been reported in a child. The majority of patients succumb after a few days of excitement. In the two cases cited one died in a state of delirium from syncope; the other recovered, the only residual signs being a facial tic and a slight ptosis. [.]

Dupouy, Roger. MENTAL DISTURBANCES IN EPIDEMIC ENCEPHALITIS.

[L'Encéphale, 1920, July 10, Vol. 15, p. 485.]

The author describes two cases of epidemic encephalitis presenting two distinct varieties of mental disturbance. In the first case after two or three days of very lively pain which appeared suddenly in the lower right extremity and was followed almost immediately by contractions and myoclonic spasms, a violent psychic excitement developed. The patient, who was confined to his bed, began to talk and gesticulate, to the astonishment of those about him. He became very irritable and later fell into a state of mental confusion characterized by visual and auditory hallucinations, visions of persons with whom he held imaginary conversations, visions of animals (notably rats) running about the room; he heard various imaginary noises, telephonic communications, etc. At the time of this mental confusion the spinal fluid showed heightened pressure and excess of albumin. When the patient had recovered from his mental confusion, but was still suffering from the choreiform affections, he became gay and light hearted, expressing full confidence that he would entirely recover, or resignation, if his condition should prove chronic. The second patient was depressed and melancholy, with fixed ideas, tics of mental origin (which could be clearly differentiated from the athetosis-like and choreiform movements, so often sequellae of encephalitis), and finally by an unnatural attitude, a stiffness and contraction of the left upper member which the author attributes to an imitation

of an organic contraction from which one of her uncles had suffered—in the patient's case a complication of pithiatic nature combined with a slight organic hemiparesis with muscular rigidity of pseudo-Parkinson type. This organic and psychopathic association could be explained by pathological hereditary tendencies of the patient. [J.]

Logre. TWO CASES OF ENCEPHALITIS LETHARGICA WITH PSYCHIC SYNDROMES RESEMBLING THAT OF CATATONIC HEBEPHRENIA. (Société de Psychiatrie de Paris, meeting June 17, 1920.) [*L'Encéphale*, 1920, July 10, Vol. 15, p. 476.]

The two observations described by the author show that the psychic syndrome of encephalitis lethargica may to a certain degree imitate that of catatonic hebephrenia and present serious difficulties in regard to diagnosis and prognosis. It was difficult to decide that the author's first case was not hebephrenia simply; that the second case, certainly encephalitis, was not at the same time one of hebephrenia; or that the mental states in both cases were not due to a postinfection dementia precox. The outcome in both cases was towards complete mental and physical recovery and the author, therefore, leaves the prognosis out of the question and considers the cases from a differential diagnostic point of view. While there are many mental diseases both toxic-infectious and constitutional which may simulate one element of the catatonic syndrome, the catalepsy or perseveration of attitude, the entire catatonic syndrome (suggestibility with catalepsy, opposition, stereotypies) is rarely observed in any other disease than catatonic hebephrenia, or "dementia precox." According to the author's observations the main interest of the psychic picture of encephalitis lethargica springs from the circumstance that, at least in certain cases, not only the cataleptic symptom is reproduced, but all the other elements of the catatonic syndrome is imitated with such singular exactitude as to mislead the diagnostician. The relations which unite the two disease pictures may be comprehended if it be remembered that the syndrome of catatonic hebephrenia is an insanity of muscular tension "spannungs irresein" (Kahlbaum); encephalitis lethargica, by lesional irritation of the motor centers also excites spastic troubles tending to become general so that this form of encephalitis might be called a disease of muscular tension, "spannungskrankheit"—the muscular factors being common to both affections; but that which is remarkable in the encephalitis lethargica is the extensive and profound infiltration, so to speak, of the motor disturbances into the psychic sphere. When the motor disturbances attack movements and groups of movements ordinarily under control of the will motor coordinations and systematizations enter into play, involving psychic activity and the syndrome is elevated to a psychomotor level. At this stadium the ensemble of the catatonic syndrome is so closely imitated as to render differentiation impossible. On the other hand the mental background of the two dis-

eases is not dissimilar, the inert passivity of the hebephrenic and his stuporous states closely resemble the lethargy of encephalitis. It may be from the likeness of the causes which give rise to the symptoms and even from a similarity in the lesions that resemblance of the two diseases arises. Henceforth in every case of catatonic hebephrenia with sudden onset, a possible encephalitis lethargica should be suspected and other symptoms should be looked for to decide the diagnosis. [J.]

Dickmann, Hans. CONCERNING ENCEPHALITIS SUBCORTICALIS CHRONICA PROGRESSIVA. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. 49, p. 2.]

The variety of form of the clinical and anatomical picture of arteriosclerotic psychoses is due to the difference of localization of the pathological changes in the brain, there being four types: (1) encephalitis chronica progressiva in which the medullary layers alone are attacked; (2) perivascular gliosis with pathological changes of the cortex and medulla; (3) senile atrophy of the cortex; (4) arteriosclerotic bulbar paralysis described by Jacobson, in which the disease processes attack the basal ganglion and the medulla oblongata. Until Binswanger in 1894 called attention to important differential diagnostic signs distinguishing the arteriosclerotic processes which make their appearance at the end of the forties, from dementia paralytica the two diseases were often confounded. The author describes an interesting case which it was at first difficult to differentiate from dementia paralytica, but which the further clinical course and autopsy proved to be encephalitis subcorticalis. The patient had suffered luetic infection; there was positive Romberg, exaggerated patellar and Achilles reflexes, absence of reaction to light and in convergence; there were also speech disturbances. A comparison of the clinical symptoms with the anatomical findings revealed that the disturbances of sensibility were due to destruction of association paths in the medullary layers of the two central and the superior parietal lobe, the defects of memory and mental deterioration, to the destruction of numerous association paths in both hemispheres of the cerebrum. The destruction of white substance in the region of the right optic radiation had produced hemianopsia. This hemianopsia was connected with hallucinations in the half of the visual field affected—a rare phenomenon which was first more accurately described in the eighties. In the author's case the cortex was not changed and only the optic radiation was affected, which is evidence that for the production of hallucinations of vision of this sort the preservation of the cortex with the interruption of the optic radiations is necessary. [J.]

Roussey, G., Villandre, G., and Cornil, L. A CASE OF JACKSONIAN EPILEPSY PROBABLY DUE TO TRAUMATIC ENCEPHALITIS. [*Revue Neurologique*, March, 1920 (*Soc. Neur. et Psych.*, Paris, Seance, March 4, 1920).]

The patient, aged 37, received a severe blow on the parietal region of the head two years before. After a day in the sun he had a generalized epileptiform attack and the following day a Jacksonian attack involving the left side of the face and conjugate deviation of the head and eyes to the left. Similar attacks continued to occur and about a month later he developed a sudden flaccid paralysis of the left upper extremity and became comatose. An operation showed the skull to be negative. At autopsy two weeks later there was found an encephalitis of the ascending parietal convolution. There were numerous round cells and plasma cells. The condition was attributed to the blow two years before and with a long latent period. The author referred to similar cases reported by Behague. [Camp.]

Prince, A. TUBERCULOUS MENINGOENCEPHALITIS WITH THE SYNDROME OF ENCEPHALITIS LETHARGICA. [*L'Encéphale*, 1920, June, Vol. 15, p. 384.]

The essential symptoms of lethargic encephalitis are encountered in a number of other affections—a fact which has been emphasized by Baudoin and Lantuejoul, Claude, Roger and Chaix, Page and others, and Lesage and Abrami have described a somnolent form of tuberculous meningitis. The case published by the author is of an epileptic having a subdural ossifluent abscess of the anterior cerebral fossa with tuberculous meningoencephalitis of the base particularly accentuated at the level of the mesencephalic region. The case presented the complete syndrome of encephalitis lethargica—a constant tendency to sleep which it was very difficult to conquer, febrile conditions, bilateral ptosis, but more pronounced on the left, myoclonic spasms of the members, rhythmical and of short duration, more marked on the right than on the left, similar to the spasms observed in encephalitis by Sicard and Kudelski. The resemblance to encephalitis lethargica was further emphasized by the absence of paralysis of the members, of pronounced disturbances of the reflexes, and of irregularities of the pulse aside from those associated with the temperature. There was a moderate degree of lymphocytosis in the cerebrospinal fluid, which is not rare in lethargica. In the light of the present knowledge of physiological pathology a plausible interpretation can be given of this case. In encephalitis lethargica the principal lesions are situated at the level of the mesencephalon. There are few macroscopic lesions. Though there are sometimes punctate hemorrhages, the lesions are for the most part histological, situated in the locus niger, the oculomotor nucleus and surrounding region. Mauthner supports the view that there is a sleep center in the mesencephalon, and this would be the center also of pathological sleep. Claude and Lhermitte localize it in the infundibular region; Salmon in the hypophysis. The author's patient was not subjected to an histological examination, but the gross lesions were situated in the mesencephalon. The abscess, per-

fectly isolated by the dura mater, involved only the inferior face of the frontal lobes and played no rôle in the lethargic syndrome. These symptoms also had no repercussive effect on the epilepsy of the patient. [J.]

Boveri, Piero. EPIDEMIC ENCEPHALITIS AND THE CHOREA OF DUBINI. [Revue Neurologique, March, 1920 (Soc. Neur. et Psych., Paris, Seance, March 4, 1920).]

Epidemic encephalitis is divided into two groups, the ordinary type in which somnolence, extraocular palsies and fever are the cardinal symptoms and the second type in which agitation, excitement, delirium and myoclonia predominate.

The first case reported was a girl, aged 19, who had influenza in October, 1918. In January, 1920, she began complaining of pain in the knees and shoulders and a few days later had fever and delirium (temperature 38.2, pulse 104). There were no extraocular palsies. The pupils were normal. The spinal fluid was normal and the leucocyte count 9062. About two weeks after this the temperature dropped to normal but the patient began having short rhythmic contractions of the flexor muscles of the forearm at the rate of about 66 per minute. There were also synchronous contractions of the diaphragm. These contractions persisted in sleep. In the second case a woman, aged 40, complained first of pain in the left arm and shoulder, later in the neck and right arm and rhythmical contractions in the sternocleido mastoid, trapezius and diaphragm, about 48 per minute. There was profuse sweating, agitation and delirium. Five days later the contractions disappeared in the arms but persisted in the abdomen and adductors of the thigh. The affection resembled very closely the electric chorea described by Dubini in 1846. [Camp.]

Russel, C. K. LETHARGY IN EPIDEMIC ENCEPHALITIS. [Can. Med. Assoc. J], August, 1920.]

This author assumes that the lethargy of epidemic encephalitis may be explained on the basis of an acute functional hydrocephalus from blocking the foramen of Magendie.

Bénard, R. SPINAL FLUID IN EPIDEMIC ENCEPHALITIS. [Paris Méd., June 5, 1920.]

Whereas in many instances the C. S. F. may be normal, this seems to be the exception in the patients examined later in the last epidemic. Lymphocytosis is common, but the fluid is clear. Albumin may be present or absent, and glucose is not constant. It is so frequent, however, that a glucose content of from 0.67 to 1.06 gm. is a material aid in the diagnosis. The urea content is unaltered unless there is uremia.

Loewe, L., and Strauss, I. STUDIES IN EPIDEMIC (LETHARGIC) ENCEPHALITIS. [Jl. Infectious Diseases, September, 1920. J. A. M. A.]

In their reported investigations Loewe and Strauss have brought forward this evidence: Berkefeld filtrates of brain material, nasopharyngeal mucous membrane and nasal washings from cases of epidemic encephalitis have produced in rabbits and monkeys lesions typical of this disease. Spinal fluid and blood have also produced the disease experimentally in these animals. Many of these animals have succumbed with the typical picture of epidemic encephalitis. The virus has been passed through many series of animals. It can be preserved for many months in 50 per cent. glycerol. Cultures made on ordinary mediums and by Rosenow's technic have proved negative. By means of the ascitic tissue culture methods perfected by Noguchi, the authors have been able to cultivate a minute, filtrable organism from cases of epidemic encephalitis: brain, nasopharyngeal mucous membrane, nasopharyngeal washings, spinal fluid and blood. The same organism has been recovered from the brain and nasopharyngeal mucous membrane of animals that have been inoculated with virus and cultures and which have succumbed to the experimental disease. The cultures thus recovered from these animals have produced the disease when injected into other animals and the organism has again been recovered. Positive animal inoculations have been obtained with the eleventh generation of this organism. Isolated colonies of the organism grown on solid Noguchi medium have been picked and pure fluid cultures secured. These fluid cultures have also produced encephalitis in animals. These results indicate that epidemic encephalitis can be differentiated from epidemic poliomyelitis for these reasons: Rabbits are susceptible to infectious material from epidemic encephalitis and not from poliomyelitis. Monkeys are very susceptible to poliomyelitis and relatively refractory to material from epidemic encephalitis. Spinal fluid from poliomyelitis is innocuous when injected into rabbits and monkeys, whereas spinal fluid from cases of epidemic encephalitis produces in both of these animals lesions typical of the disease. Control studies have been uniformly negative with material obtained from human patients suffering from or dead of, conditions other than epidemic encephalitis.

Buzzard, E. Farquhar. LETHARGIC ENCEPHALITIS. [British Medical Journal, November 20, 1920.]

Buzzard spoke on certain clinical aspects of lethargica encephalitis, and pointed out that the name was unfortunate in that it presumed one of the many symptoms which any form of encephalitis might give rise to. It should be remembered that an inflammation of the encephalon could produce as many symptoms as there were functions of the brain. The tendency to attach importance to any particular symptom and to recognize different types of the disease answering to the predominance of those

or that disturbance of function was to be deplored. Involuntary movements, for instance, had been observed in many cases from the beginning of the epidemic, and christening such cases as belonging to the "myoclonic type" was setting an example which, followed, would lead to an absurd situation. We should soon have as many types as there were cerebral functions. It would be more profitable to consider the variations in the onset and course of the disease and to admit at once that any symptoms indicative of a disturbance of a cerebral function might or might not be present. During the epidemic he had observed many mild or ambulatory cases which had been characterized by a general dulling of the higher intellectual faculties, and still more by the frequent complaint of diplopia. This did not indicate necessarily a peculiar incidence of the morbid process on the oculomotor nuclei. The explanation probably lay in the fact that there was no disturbance of function which so immediately revealed itself to a patient as that of the oculomotor apparatus. We could all suffer from slight deterioration in the activity and accuracy of our facial, masticating, articulating and deglutitional movements without being painfully conscious of the fact. On the other hand, the slightest defect in the condition of an eye movement could not be overlooked.

Another question of interest was the significance of lethargy. This symptom only occurred in a certain proportion of cases, and could not be regarded, therefore, as general as opposed to a focal phenomenon. In most cases of lethargy there is found some sluggishness or total abolition of the pupillary reflexes, and it seemed possible that lethargy was evidence of internal hydrocephalus, the result of occlusion or partial occlusion of the aqueduct of Sylvius. It did not seem unjustifiable to suppose that even a moderate amount of inflammation of the corpus quadrigeminal region would suffice to bring about this interference with the free circulation of the cerebrospinal fluid. A similar condition was not infrequently produced by tumors in this situation. In fact, lethargy going on to stupor associated with disturbance of pupillary reflex activity was characteristic of tumors at the posterior end of the third ventricle.

Attention should be drawn to the great variation in the onset of this disease. Some cases were fulminant and others appeared to develop slowly over periods as long as several weeks. Moreover, the disease varied much in its course. Relapses were not uncommon in acute cases, with a recrudescence of fever, headache and even cutaneous rashes. Finally, emphasis should be laid on the appearance of fresh symptoms weeks and months after the acute stage of the disease had passed off. These generally took the form of involuntary movement, or an increase in the rigidity of limbs, which was not an uncommon legacy of the disease. [Author's abstract.]

Greenfield, J. G. MORBID ANATOMY OF ENCEPHALITIS. [B. M. J., November 26, 1920.]

Dr. Greenfield showed a series of lantern slides illustrating the morbid anatomy of lethargic encephalitis.

The changes found in most early cases were very diffuse and could usually be traced from the medulla to the cortex. Sometimes one part of the brain stem or cerebrum was especially damaged, but that was more an accident due to vascular occlusion than an essential feature of the disease. The most constant appearances were capillary dilatation and infiltration of the brain substance with small cells of the lymphocyte type, which were often grouped round the nerve cells as though attacking them (neuronophagy). These round cells could often be seen passing out from the walls of the capillaries. The appearance of "cuffing of the vessels," due to infiltration of the Virchow-Robin space with round cells, was very commonly seen, but was absent in many sections where other changes could be seen, and might only involve one or two vessels in the whole brain and brain stem. An excess of lipochrome pigment in the nerve cells was sometimes found, and when present was extraordinarily diffuse, affecting almost every nerve cell throughout the brain; its meaning was obscure. A comparatively common feature of the disease was infarction of the brain, due to thrombosis of smaller or larger arteries. Slides were shown illustrating infarction of the surface of the brain in one case and of the centrum ovale and basal ganglia in another. Slides were also shown illustrating calcareous and thrombotic changes in the vessel walls, which were sometimes found in cases of longer standing. The cerebrospinal fluid in lethargic encephalitis was of very varied appearance and composition. In about 50 per cent. of cases no abnormality could be detected. Among the other 50 per cent. uniformly blood-stained fluids, or fluids with a yellow tinge from altered blood, were not uncommon, and the albumin, globulin and cells might rise considerably. But in no case examined had either a fibrin clot or polymorphonuclear leucocytes been found. This formed a valuable diagnostic point in distinguishing lethargic encephalitis from polioencephalitis and tuberculous meningitis. [Author's abstract.]

Micheleau. RELATIONS BETWEEN GRIPPE AND EPIDEMIC ENCEPHALITIS. [Gaz. hebdomadaire des sciences médicales de Bordeaux, May 16, 1920.]

The author was on duty in Europe with Algerian troops in the spring of 1918, at which epoch a wave of influenza appeared in Flanders. At this time several thousand cases were observed. Among his grippe cases he saw much somnolence. The fever and other general and local symptoms seen were those of influenza. But in these cases the affection was soon over and indeed might have been termed a "three day fever" as far as the majority of them was concerned. The sleep component he thinks might have been a reaction from the war tension. The author

gives two case histories which would ordinarily have passed for influenza. Later the diagnosis leaned very strongly to epidemic encephalitis. This was of the myoclonic type in one patient, while in the other case the patient first went through a grippal broncho-pneumonia, which had as a sequela a cerebral affection in which somnolence was a factor. In the absence of our present information concerning sleeping sickness, the author seems to think, both these cases would unhesitatingly have been regarded as cerebral influenza.

Tobler. ACUTE, FOCALLY DISSEMINATE, NONPURULENT (LYMPHOCYTIC), TOXIC-INFECTIOUS, EPIDEMIC POLIOENCEPHALOMYELITIS. [Schweiz. med. Wochenschrift, June 10, 1920.]

An account of the pathological data of ten cases is here concluded, and a neelaborate discussion of the intimate nature of the process and its relations to other cerebral affections follows. Among the affections discussed are African sleeping sickness, rabies, certain affections peculiar to various animals, such as Borna's disease of horses, acute poliomyelitis, polioencephalitis of the vertex and grippal encephalitis. Special attention is called to differentiating the latter. In the author's experience grippal encephalitis is usually cortical by preference and hemorrhagic, while lethargic encephalitis is neither. In one case of epidemic encephalitis a cerebral hemorrhage was placed in association with a complicating hemorrhagic pneumonia. In the pathological institute the two affections, which had prevailed side by side, ceased at the same time, which was rather a striking coincidence. The author believes that while in the clinic the two affections may at times be readily confounded, the autopsy will readily clear up the confusion so that our own health officers should encourage autopsies in all cases of cerebral death in which one or the other of these two maladies could be the cause.

McIntosh, J. EXPERIMENTAL LETHARGIC ENCEPHALITIS IN MONKEYS AND RABBITS. [Br. J. Exper. Pathol., October, 1920.]

Experimental lethargic encephalitis has been here transferred to monkeys and rabbits. One spontaneous case is also recorded.

Guizzetti. PATHOLOGICAL ANATOMY OF LETHARGIC ENCEPHALITIS. [Rif. Med., September 4, 1920.]

Nine cases of lethargic encephalitis are here described in detail. The changes are scattered in distinct foci and may be spread over the whole cerebrospinal axis. The points of chief involvement were the mesencephalon, especially between the corpora quadrigemina, in the bundles of the cerebral peduncles, and in the substantia nigra. From the pons to the bulb the lesions get fewer; sometimes they reappear in the spinal medulla; in the thalamus the changes were inconspicuous and sometimes absent. Other parts of the brain were very little affected, although not

quite free from disease. The pia mater always showed pathological changes. Inflammatory foci were found in the oculomotor nerves (almost exclusively in their intracranial course), rarely in other cranial nerves, and still more rarely in the spinal roots. In most cases there was some focus of inflammation in the gasserian ganglia. The disease is an infective one, according to Guizzetti, due to some specific organism propagated by way of the blood vessels, as is suggested by the changes in the veins and the form of the inflammatory centers at the onset. Conveyance of the infection through the lymphatic sheaths of the nerves is excluded, since the inflammatory lesions in the cranial nerves were usually limited to their intracranial course. Whatever the germ may be, its action is relatively mild, as shown by the lymphocytic type of infiltration, the limited type of karyokinesis, and the constant absence of true necrosis. Three weeks from the onset the germs begin to disappear and processes of repair are in evidence.

Demole. LETHARGIC ENCEPHALITIS WITH COMPLETE INTERNAL OPHTHALMOPLÉGIA. [Rev. méd. Suisse rom., June, 1920.]

A boy, aged 13, with lethargic encephalitis, showed dilated and unequal pupils, with loss of light and accommodation reflexes. An external ophthalmoplegia consisted of slight ptosis only, and was of shorter duration than the internal ophthalmoplegia.

Cramer. ENCEPHALITIS LETHARGICA IN HOLLAND. [Nederl. Tijdschrift voor Geneeskunde, 1920.]

The grieppe epidemic which existed in Holland during the period April-August, 1919, but in a vanishing stage, was attended by cases of the new sleeping malady reported by a number of Dutch physicians. One spoke of encephalitis gripposa and cerebral grieppe. It was thought that the influenza was returning in a new wave. The author has recently seen in Utrecht a typical case of sleeping sickness which was not associated with influenza and which, studied in great detail, shows a distinct behavior throughout. He next compares his case critically with those seen during 1918 and 1919 and concludes that the type is the same. Attention is called to grippal encephalitis seen in cases of grieppe pneumonia as an entity which differs from primary encephalitis. The author does not attempt to exclude the hypothesis that sleeping sickness may be a parainfluenza—a special form due to a neurotropic strain of the grieppe virus.

Dessy and Grapiolo. LETHARGIC ENCEPHALITIS. [Rev. Sud-Amer. de Endocrin., July 15, 1920.]

Three cases of lethargic encephalitis are here reported from Buenos Aires, where the disease is little known. In each case they isolated from the cerebrospinal fluid a diplostreptococcus whose morphological

and cultural characters resembled those of the diplostreptococcus which was found by numerous observers in the last pandemic of influenza. Inoculations did not reproduce lethargic encephalitis in monkeys.

Harbitz. LETHARGIC ENCEPHALITIS. [Norsk Mag. for Laegevidenskaben, June, 1920.]

On the basis of a number of postmortems this observer, who has written extensively on the pathology of poliomyelitis, comes to the conclusion that lethargic encephalitis differs so much from other known forms of encephalitis that it must be regarded as a disease *sui generis*. This disease crops up in connection with epidemics of influenza, and he suggests that influenza may predispose to lethargic encephalitis in the same way that it predisposes to severe streptococcal and pneumococcal infections. In two of his cases he found a small Gram-positive diplococcus in the central ganglia of the brain. It grew in pure cultures on ascites-agar plates, forming small transparent colonies which could be subcultured, but which soon died out.

Stephen, L. P., and Bulchandani, K. M. EPIDEMIC ENCEPHALITIS. [Indian Medical Gazette, March, 1920.]

These authors thus describe this disease as observed in Karachi. The onset may be acute and fulminant, or be insidious and take a more or less benign course. Very young children are rarely attacked; most patients are from fifteen to forty years of age. Five out of six are males. Cases are found in all grades of society. The onset is mostly insidious, with generally a stage of excitement at first. The patient may show nothing but a marked eccentricity and an easy excitability on slight provocation, and may have hallucinations and delusions. In other cases a sudden diplopia is the first symptom. Sooner or later the subject becomes lethargic and looks very sleepy. He lies with drooping eyelids, unconcerned about himself and his surroundings, has little or no initiative, and at the height of the disease may show a complete lack of spontaneous motion. If questioned a short intelligent response can generally be elicited, after a delay. Various types of paralysis appear, always related to cranial nerves and apparently of nuclear origin. Sensory nerves are rarely involved. Among other symptoms are general rigidity of the limbs, not always present, slight retraction of the head, tremors of the muscles of the face and limbs, sometimes restless movements of the latter. Muscular power is weak. Sugar may appear in the urine. Reflexes are present as a rule. There is little or no tendency to bed sores. In fulminant cases the patient may be struck down suddenly, become unconscious, and die sooner or later. Constipation is another definite feature. The tongue has a thin whitish coating and is large, thick and slightly indented at the edges. The breath is foul, the appetite unimpaired, the liver and spleen not enlarged. Retention of urine may be

one of the first symptoms, or may appear later, to be still later replaced by involuntary passage of urine. Fever is generally present, the temperature ranging from 100° to 101° F., but rising to 104° or 105° in unfavorable cases. The skin is usually moist and there may be profuse perspiration. A rash, either rose or purpuric, may appear early or not until the thirteenth day.

In favorable cases the temperature falls by lysis, the patient begins to take interest, and his symptoms improve. Ptosis is generally the last symptom to disappear. In unfavorable cases with high temperature and acute toxemia the patients die of asthenia or edema of the lungs. The pathological changes described are those of hemorrhagic encephalitis. There may be pin point aggregate foci of hemorrhage more frequently in the mesencephalon than elsewhere. A sort of patchy diffuse meningitis with cellular exudate has also been found. All cases showed a moderate amount of leucocytosis and were negative to blood parasites. The cerebrospinal fluid was clear and under no pressure. Concerning the nature of the disease, the writers do not believe it to be connected with influenza, but refuse to venture an opinion as to whether it is a new disease or not. As regards treatment, calomel in fractional doses and salines are useful to relieve constipation and lessen intestinal auto-intoxication. Eserine was found to be of little use. Urotropin in gram doses was given without noteworthy results, but its use is recommended as the only useful antiseptic in cerebrospinal infections. Three patients were treated with an intravenous injection of salvarsan, after which the improvement was very rapid and striking.

Levaditi, C., and Harvier, P. THE VIRUS OF LETHARGIC ENCEPHALITIS.
[Presse médicale, March 31, 1920.]

These authors have succeeded in reproducing encephalitis in a rabbit by intracerebral inoculation of an emulsion of gray matter from a human case of the disease. Upon repeated passage through rabbits the virus became a fixed virus and exhibited the property of killing the animal in from four to six days. The animal showed a torpid state, myoclonic manifestations, and symptoms of meningeal irritation. Postmortem there were found typical encephalitic lesions analogous to those described in man. The virus, which is not cultivable by the ordinary methods, may be kept in glycerine. It is a filterable virus, easily passing through No. 1 and No. 3 Chamberland filters. It can be inoculated into the rabbit not only by the cerebral route but also by way of the peripheral nerves. After repeated passage through rabbits it becomes pathogenic for the lower catarrhine ape. The general conclusion reached is that the virus is a specific, filterable virus, plainly distinct from that of epidemic poliomyelitis.

Combemale and Duhot. LETHARGIC ENCEPHALITIS. [Bulletin de l'Académie de médecine, April 13, 1920.]

Twelve cases of lethargic encephalitis seen at Lille showed a considerable variation in the earlier symptoms, some cases exhibiting a sudden onset with vomiting and distinct constitutional reaction and others beginning insidiously with somnolence, at first intermittent and later continuous. In some cases visual disturbances constituted the initial symptom, leading the patient to consult an oculist. Hypersomnia ranged from simple apathy to profound lethargy. Delirium and restlessness sometimes developed at night. At times there was distinct catatonia, and two patients presented, especially during convalescence, certain features suggesting Parkinson's disease. Most cases showed at least temporary diplopia. One third of the cases had internal ophthalmoplegia, and the possibility of facial or velopalatine paralysis was also noted. The knee jerks were generally exaggerated, sometimes unequally on the two sides; in two cases they were absent. Fever was variable, constipation frequent and obstinate, and marked loss of weight generally observed. Low blood pressure was found to be an important feature. The cerebrospinal fluid generally issued at high pressure; albumin was normal or slightly raised, and sugar rather increased than diminished. Lymphocytosis in the cerebrospinal fluid was constant but slight; sometimes it persisted even after disappearance of the clinical signs. Urea in the blood and cerebrospinal fluid was high in the grave cases. In the diagnosis, the cerebrospinal fluid should always be taken into account. Marked lymphocytosis and hyperalbuminosis suggest rather a meningeal reaction due to tuberculous or syphilitic infection or to mumps, while slight lymphocytosis and slight or absent hyperalbuminosis confirm the suspicion of lethargic encephalitis, excluding from the start a neurosis or ordinary infection. The prognosis may be based upon the same series of factors. Death seems to occur in two ways. In some instances there are evidences of infection and fever, which may be very high; the rise in the temperature, either progressive or following a remission, is the most important sign. In the other group death takes place through secondary intoxication, gradual increase of the blood urea occurring as an indication of oncoming tissue disintegration.

Laubie. INTRASPINAL INJECTION OF ANTITETANIC SERUM IN LETHARGIC ENCEPHALITIS. [Bulletin de l'Académie de médecine, March 16, 1920.]

Having treated some cases of lethargic encephalitis with urotropin and collargol, without benefit, administered, in two subsequent cases, intraspinal injections of antitetanic serum, previously used with success by De Coquet in a case of encephalitis with pronounced rigidity, suggesting tetanus. In Laubie's first case thus treated, the injection, given on the fourth day, was followed in thirty-six hours by marked improve-

ment, the temperature descending and the dyspnea, ptosis, photophobia, neck rigidity and somnolence passing off. In this case lumbar puncture had yielded clear fluid showing a little albumin, a few lymphocytes, no bacteria, and negative Noguchi and Bordet-Wassermann tests. The second patient exhibited somnolence, slow speech and movements, rigidity of the neck, and positive Kernig's sign. Lumbar puncture yielded fluid containing a few erythrocytes, 0.78 of albumin, no bacteria, and a weakly positive Noguchi. Injection of tetanus antitoxin was followed by disappearance of rigidity and Kernig's sign in forty-eight hours, and subsequently, of the other manifestations of the disease.

3. SPINAL CORD.

Herzog, M. SPINAL GANGLION AND SCLERODERMA. [Schw. med. Woch. July 29, 1920.]

Cystic degeneration of the spinal ganglia and posterior roots was found in a man of 60 years who also had progressive scleroderma. Marburg has described a similar case of disease of posterior ganglia with trophic skin changes.

Barbé, André. FUNCTIONAL RESTORATION IN SPINAL CONCUSSION. [Bulletin Médical, 34, 373, April 21, 1920.]

The patient received a bullet wound in the middle lumbar region which was shown on operation to be at the level of the eleventh dorsal vertebra and to have fractured the twelfth. In extracting the bullet the spinal canal did not have to be opened, and there was no escape of spinal fluid. The immediate symptoms included paraplegia, lost knee and plantar reflexes, sensory losses of lower extremities, retention of urine and feces. Seventeen days later retention was succeeded by incontinence. Absolute anesthesia over the legs up to the region of Poupart's ligament existed. Some flexion movements of thighs on the pelvis were possible. Sixty-five days after the accident, the sensory condition remained the same. There was positive Babinski on both sides, increasing improvement of the extensors, and seven months after the accident the patient could walk with two canes. Deep and superficial sensibility returned, the knee reflex was now obtained on the right. The Babinski reflex was positive only on the right. The atrophy was greater on the left. There seems to have been parallelism between motor and sensory recovery, for in each the return of function progressed from the proximal part of the leg to the peripheral. [Stragnell.]

Jakob, Alfons. CONCERNING THE PATHOLOGY OF SPINAL CONCUSSION. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. 51, p. 247.]

The author describes a case of indirect traumatic injury of the cord which, he states, from its pathogenic purity illustrates in an excellent

manner the origin of the symptoms following spinal concussion. After a wound from a projectile at the level of the twelfth vertebra, motor and sensory paralysis developed, indicating injuries situated in the third lumbar segment and thence downward, involving various segments of the cord in varying degrees. The disease picture which, in general, was of stationary character, was terminated by the sudden rupture of an aneurysm of the aorta. The autopsy revealed macroscopically a splintering of the left transverse process of the twelfth dorsal vertebra and, with intact dura and preservation of the configuration of the spinal cord, a barely perceptible discoloration of the gray matter of a circumscribed area in the lumbar and upper sacral medulla. The gravity of the alterations was only revealed by the microscopic examination. They consisted in a diffuse degeneration of the nerve fibers in the white matter of the upper sacral and lower lumbar medulla together with edematous saturation of the tissue. Besides there were small necrotic lesions, diffuse parenchymatous alterations, dilatation of blood vessels and sometimes exudation of blood. In places there was also degeneration of the posterior root and proliferation of the pia. These histological findings fully explained the neurological symptoms. The case is noteworthy because it proves that serious changes of structure may take place without direct injury of the spinal cord and vertebral column, being one of those rare cases in which a spinal concussion is found to have produced serious traumatic injury of the substance of the cord, showing the tangible organic basis upon which the commotional symptoms depend. The author is of the opinion that hemorrhages do not play an essential rôle in the production of the clinical manifestations. He found the same degeneration of the posterior roots together with ascending degeneration of the posterior column fibers in animals after concussion of the spine had been produced for experimental purposes. These findings throw light upon the problem of traumatic affections of the posterior column and the relation of trauma to syphilogene tabes. In the behavior of the pia in the author's case disturbances of lymph and spinal fluid circulation were also indicated. [J.]

Lhermitte, J. COMPLETE DESTRUCTION OF THE LUMBO-SACRAL PORTION OF THE SPINAL CORD. SYMPATHETIC AUTOMATISMS. [*Revue Neurologique*. January, 1920.]

The patient survived his injury for nine months and autopsy showed complete destruction of all portion of the spinal cord below the twelfth dorsal segment. In view of the complete destruction of the cord the phenomena elicited could only have been the result of sympathetic nerve supply. Friction of the chest or pinching the ear produced a sensation in the feet similar to those sometimes felt in amputated limbs. The bladder and rectum developed automatic functions. The only difference in the case of total destruction from those of transection is that in the

latter external excitations affect the bladder functions whereas in the former they do not. The skin of the legs remained absolutely dry but the pilomotor reflex persisted in the legs. [Camp.]

Lhermitte, J. THE PAINFUL FORMS OF SPINAL CORD CONCUSSION. [*Revue Neurologique*, March, 1920.]

The painful forms are divided into four classes. Those in which the pain is radicular, spontaneous and like the pains of tabes. Those in which there is no spontaneous pain but the skin and mucous membranes are hypersensitive. Those with a causalgia type of pain—this type is rare but most severe. Those with the type like electric shocks—this probably indicates regeneration of the cord and the prognosis is most favorable. [Camp.]

Guillain, G., and Barré, J. A. ORGANIC PARAPLEGIAS WITHOUT LESIONS OF THE DURA MATER IN SPINAL INJURIES CAUSED BY PROJECTILES. [*Annales de Médecine*, 1918, No. 2.]

The writers discuss fifteen cases of fatal indirect injury of the spinal cord by projectiles. The shots usually passed in the vicinity of the dura mater which, however, remained intact. The projectile often injured spinous processes, lateral epiphyses or vertebrae. The form of injury to the spinal cord consisted in larger or smaller hematomyeliae with concomitant myelomalacia, resulting after extension in four cases in complete divisions of the cord and in eleven cases in focal lesions. The hematomyeliae were produced by the rapid passage of the projectile near the spinal cord yet without touching the latter. [J.]

Mason and Reinhoff. HEREDITARY SPASTIC PARAPLEGIA. [*Bull. Johns Hopkins Hosp.*, June, 1920.]

Observations on three generations affected with hereditary spastic paraplegia are here presented. In seven of the families recorded in literature symptoms of the disease were present in more than two generations. It is not possible to group the reported cases into rigid clinical types, on account of the variety of syndromes which have occurred from combinations of the symptoms associated with spastic paraparesis, such as tremor of the tongue, disturbances of speech, optic atrophy, nystagmus, ocular palsies, bulbar disturbances, sialiosis, ataxia, muscular dystrophies, and sometimes mental impairment. Though in a few cases the spastic paraplegia is the only feature, in the majority the symptomatology approaches that commonly observed in hereditary ataxia of the Friedreich or Marie type, and sometimes a differential diagnosis is impossible. In all three diseases the etiology, clinical course, and pathological anatomy are similar. The diseases usually commence about puberty, and progress slowly to a point at which they remain stationary. There is much evidence in favor of regarding them as clinical forms of the same

morbid entity. In all there is a well marked combined sclerosis of the postero-lateral tracts. From multiple sclerosis this group can be differentiated by the familial occurrence of the disease and the absence of remissions, as well as by laboratory examinations of the spinal fluid.

Krabbe, K. H. CONGENITAL FAMILIAL SPINAL MUSCULAR ATROPHIES AND THEIR RELATION TO AMYOTONIA CONGENITA. [Brain, July, 1920.]

Amyotonia congenita seems to be a benign and not an hereditary disease. Eight of eleven cases which have come to necropsy have shown severe atrophies of the anterior horn cells and muscles. In two of Krabbe's cases of hereditary congenital muscular atrophy corresponding changes were seen. These changes resemble those in Werdnig-Hoffmann's progressive muscular atrophy. In six cases the disease clinically resembled closely amyotonia congenita. Later familial study showed that it was hereditary.

Kaumheimer, L. PROGRESSIVE DYSTROPHY AFTER POLIOMYELITIS. [Ztsch. f. Kinderheilkunde, May, 1920.]

Muscular dystrophy in a child developing five years after acute poliomyelitis is here described. Fifty other cases on record in which spinal muscular atrophy developed after poliomyelitis are recorded. Only two were females. The relative frequency of a spinal amyotrophy after poliomyelitis and the rarity of progressive muscular dystrophy after it suggest some causal connection with the former, while with the latter a casual coincidence alone can be maintained.

Cadwalader, W. B. DIVISION OF SPINAL CORD BY GUNSHOT WOUND. [Annals of Surgery, June, 1920.]

Complete division of the cord at the tenth thoracic segment by gunshot wound in a case reported on by this observer was not fatal. Automatic emptying of the bladder must be established, however, if the patient is to live a comfortable chair life. The case was favorable for spinal cord suture but no functional results seemed to follow. The patient had, however, lived for nineteen years.

Mason, V. R., and Rienhoff, W. F., Jr. HEREDITARY SPASTIC PARAPLEGIA. [Bull. Johns Hopkins Hospital, June, 1920.]

The authors here report upon four cases of hereditary spastic paraplegia through three generations. The cases differ only in minor details from others that have been reported.

Baker, R. H. DELAYED SYMPTOMS IN FRACTURE OF VERTEBRAL BODIES. [Surgery, Gynecology and Obstetrics, October, 1920.]

Baker, in a discussion of Kümmel's disease, presents the following conclusions: 1. Compression fracture of the spinal bodies without cord symptoms is frequently undiagnosed, or incorrectly diagnosed at the time of injury. 2. A negative finding by the x ray at the period of initial injury is not proof positive against fracture. 3. Symptoms referable to the fracture may not occur for some time after injury. 4. At this later period the signs and x ray findings are all in keeping with a diagnosis of compression fracture of the spinal bodies. 5. The exact sequence in the pathology leading to such a diagnosis is not understood. 6. The prognosis will depend on the time of diagnosis and the institution of proper treatment. 7. The treatment is that of compression fracture of the spine.

de Teyssieu, Molin. PERISCAPULAR AMYOTROPHY OF MYELOPATHIC TYPE. [Gaz. Hebd. des Sci. Méd. de Bordeaux, 1920, August 29, p. 417.]

The writer has shown to the Bordeaux Society of Medicine and Surgery a young man of twenty, with a very neuropathic heredity, in whom six months ago a rapidly progressive atrophy of the left shoulder girdle appeared without appreciable cause, or trauma, articular trouble, or general reaction. Three months later there was great pain in the left shoulder joint, with fever, lasting for only three or four days. There is now muscular atrophy affecting the left shoulder muscles in the following order of severity: deltoid, biceps, spinati, trapezius, pectoralis major, and slightly the forearm muscles. There is bilateral exaggeration of tendon jerks and alteration of stereognostic perception, with paresthesia, in the left hand. The shoulder joint is painful on pressure, but not on movement. Medical, surgical, radiographic and bacteriological examination is negative. The writer thinks that the atrophy is due to a myelopathic process of undetermined nature, in spite of its resemblance to a reflex amyotrophy. [Leonard J. Kidd, London, England.]

Huenekens, E. J., and Bell, E. T. INFANTILE SPINAL PROGRESSIVE MUSCULAR ATROPHY (WERDNIG-HOFFMANN), REPORT OF CASE WITH AUTOPSY FINDINGS. [Am. Jl. Dis. Children, December, 1920. J. A. M. A.]

From a review of the literature and of their own case, Huenekens and Bell believe the conclusion seems justified that amyotonia congenita (Oppenheim) and infantile spinal progressive muscular atrophy (Werdnig-Hoffmann) are extreme types of the same disease; that they are probably both related to the group of myopathies represented by Erb's juvenile form of muscular dystrophy and the hereditary form of Leyden and Moebius.

Rennie, G. E. SECTION OF SPINAL CORD. [Australian Med. Congress, August, 1920, Med. Jl. Aust., September 18, 1920.]

The author here gave a careful description of the neurological signs and symptoms presented by a patient who had suffered a complete transverse lesion of the cord at the level of the fourth dorsal segment, caused by a shrapnel bullet. The diagnosis had been verified at operation. There was hypertonus of the extensor muscles, including ankle and patellar clonus and extensor spasm in both lower limbs. The condition resembled a paralysis in extension. There was absence of response to faradism in certain groups of muscles. There was a peculiar subjective concentration in the cervico-occipital region. The signs and symptoms corresponded to an incomplete lesion of the cord with a functional, efferent, pyramidal tract, subserving postural tonus. As it had been proved that the lesion was complete, Rennie was forced to the conclusion that the distal portion of the cord of this patient still retained mechanisms for postural tone.

Krabbe, Knud H. CONGENITAL INTRASPINAL CYST, PROBABLY AN ANTERIORLY CLOSED MENINGOCELE. [Revue Neurologique, July, 1919.]

An apparently congenital cystic formation, the symptoms appearing shortly after birth, is described. The mother reported lessened fetal motion during the last months of pregnancy. The birth was normal. A week later it was noticed that the child could not move its legs. On admission to the hospital examination showed the upper extremities to be normal, face musculature normal, the child was of normal size. The neck was strikingly short. There was a kyphosis with dorsal curvature. A small hollow could be felt at the lower part of the sacrum. The abdomen was large and flabby, paralyzed, with abdominal reflexes lacking. No defect of the spinal column was visible from radiographic prints. Spinal fluid on two occasions was tinged with blood and later slightly yellow in color. Cultures were negative. The child grew progressively weaker, lost weight, was repeatedly cyanotic and died at about nine months of age. Autopsy revealed a cyst 2 cm. long, 6 mm. wide and 4 mm. deep in the leptomeninges, in front of the marrow, which was compressed at the level of the cyst into half moon shape. The central canal was compressed. Microscopically the cyst consisted of connective tissue, entirely extramedullary. It was attached to the dura and was situated within the arachnoid.

An interesting finding in the marrow was the quantity of small defects corresponding on one side to the anterior horn. On the other side there was a large defect filling the whole anterior horn. The author considers dermoidal, parasitic or hemorrhagic causes for the cyst out of the question. It was also probably not traumatic nor necrotic. Its relation with meningoceles was considered a possibility, spina bifida cases being cited as somewhat analogous. Difficulties in diagnosis lay between

hematomyelia, cyst, and hematomyelia combined with tumor. The mother's report of diminished fetal motion might point to cyst. [Stragnell.]

Stenvers, H. W. TWO INTRADURAL EXTRAMEDULLARY TUMORS. [*Nederlandsch Tijdschr. voor Geneeskunde*, 1917, LXI, H 2, 863 (3 figs.).]

Stenvers records two cases of intradural extramedullary endothelioma removed by operation. The first was a fairly characteristic one, but the second was unusual in several respects. Both showed the Brown-Séguard type of paralysis. In both there was present a pain reflex without pain perception; in the first case this phenomenon was present for only about ten days after operation, whereas in the second it was present before operation. In the first case there was a strongly positive Nonne's reaction, phase 1, in the cerebrospinal fluid; in the second a slight one was present. The diagnosis in the second case was difficult: cases are cited in which (1) a Brown-Séguard paralysis with a strongly positive Nonne phase 1 was found on operation to be due to a very small intramedullary tumor (pea size), and (2) a syringomyelia with a strongly positive Nonne was verified on necropsy. In Stenvers' second case there was, however, no definite hyperesthetic zone. A diagnosis of an extramedullary lesion, possibly on the ventral aspect of the cord, was made. By operation a very benignant endothelioma, the size of a cherry, was removed. [Leonard J. Kidd, London, England.]

Marcuse, Elizabeth. CONCERNING ASCENDING DEGENERATION IN A CASE OF GUNSHOT INJURY OF THE LUMBO-SACRAL MEDULLA IN MAN. [*Neurol. Centralbl.*, 1919, Vol. 38, p. 738.]

Numerous researches have been made concerning the paths of sensibility in the brain and spinal cord, yet the author believes that the case here described may contribute to clear up some neurological points still in controversy. In general the author's results confirm those of earlier works, but in two directions they seem to be of importance. First they furnish evidence that not all the fibers of the posterior columns terminate in the nuclei of the column, in confirmation of the view of Goldstein, B. Schaffer and Hoche as opposed to Rauber-Kopsch, Kohnstamm, Villiger, Lewandowski and others. The author found numerous fibers which could be followed after the median lemniscus up to the nucleus fasciculi anterioris, thus proving that there must be long posterior column fibers, which do not terminate in the nuclei of the posterior columns but at a higher level. Secondly, the findings in this case differ essentially from those of previous authors in regard to the medial tract of the lateral column paths. This fasciculus of fibers is designated by Goldstein the tractus spino-olivaris, and there was doubt whether the fibers ran in ascending or descending direction. Goldstein ascertained that the bundle contained at least some fibers running in ascending direction. The au-

thor was able to follow a part of the fibers nearly to the thalamus boundary and found that another part of the fibers has a common termination with posterior column fibers in a ganglion corresponding to the nucleus fasciculi anterioris. The author interprets these findings in their bearing on the paths of sensibility. According to the physiologico-anatomical descriptions of Edinger, Long, Van Gehuchten and other authorities, it would have to be assumed that proprioceptive sensibility is conducted by way of the posterior columns and that the paths for pain and temperature are in the anterior lateral columns. The path for the sensation of touch would have two components, however, one in the homolateral posterior columns and the other in the crossed anterior lateral columns. In this way the stimuli which give rise to a feeling of such unity of character as touch would have two separate conduction paths, which seems improbable. It would seem much more in keeping with the results if the two paths met at a common station and proceeded thence united to the cerebral cortex by way of the thalamus nucleus. According to the author's findings this seems to be what really takes place. The tractus spino-tegmentalis corresponds to the medial part of the sensible anterior lateral column paths and in the nucleus fasciculi anterioris it meets with fibers out of the posterior columns. Here the union of the two components of the conduction path for touch is formed, and from this point the stimuli as a unity are conducted to the brain. [J.]

Redlich. TUMORS OF THE CAUDA EQUINA. [Wien. kl. Woch., June 24, 1920.]

Operations on tumors of the cauda equina are usually unsuccessful. The tumors are often metastatic growths, which cannot be removed. The symptoms for a long time are those of severe sciatica only. When the clinical picture is complete it consists of pain, sensory disturbances in the sacral segment, abolition of the tendon reflexes, pareses and sphincter disturbances. The condition must be distinguished from affections of the conus. Unilateral symptoms or decided differences on the two sides suggest affection of the cauda equina. Two cases of tumors of the cauda equina in which operation was successful are here reported. The first, in which the symptoms had been present for ten years, was that of a dermoid cyst; in the second (a fibro-endothelioma) the condition had lasted five and a quarter years.

Elsberg, C. A. SPINAL CORD TUMORS. [Am. J. Med. Science, February, 1920.]

Spinal tumors occurred outside the cord, as a rule. He had operated upon 67, of which 49 were extramedullary and 18 intramedullary. In 42 of these the tumor was within the dura. They were found most often in the cervical roots of the cauda. The posterior aspect of the spinal cord was a site of election. Growths which formed between the dentate

ligament and the posterior roots, specially caused severe root pains and in a relatively early stage might induce the Brown-Séquard syndrome. Radicular pains were rare in the antero-laterally lying tumors. The amount of pressure exerted upon the spinal cord by a growth was not proportional to the size of the growth or its duration. Large tumors were usually softer; the small, hard tumors caused most damage. From the appearance of the cord at the operation it was impossible to determine how great the actual damage had been and likewise the degree of recovery which might be expected. Little sensory disturbance might be caused by large tumors. In diagnosis, the most frequent difficulty was to distinguish between true spinal cord neoplasm and malignant vertebral disease. Intramedullary tumor was also difficult to diagnose. In all, 105 patients were operated upon for certain, probable, or possible tumor. In 70 of these, the diagnosis of tumor was made or its existence considered probable and in 60 a tumor was found. In the remaining 35, tumor was considered possible but not probable; in only 7 was a tumor found. In the majority of cases the tumor was found at or near the suspected level. Concerning end results, many recovered completely; others retained disturbing symptoms, but improved; others showed little or no improvement. There was a fatality rate of 10 per cent., but the writer thinks that with experience and a proper selection of cases the fatalities could be reduced to 6 per cent.

Ducamp and Milhaud. DISSEMINATED SCLEROSIS DUE TO SHELL CONCUSSION. [Presse médicale, May 5, 1920.]

The authors here report the case of a man who was temporarily buried by the explosion of a *minenwerfer*, remained deaf for two days, and then resumed his military service. One year later he felt pain in the left lower extremity, sometimes of lightning-like character, which came on with fatigue and passed off with rest. Later paralysis of the right arm and leg appeared, together with sphincter disturbances. Vision was impaired for a time. The paralysis was later partly recovered from, but the patient, on detailed examination, showed the various disorders of locomotion, motility of the upper limbs, reflex action, vision, sensation, voice and sphincters characteristic of disseminated sclerosis. A number of more or less similar cases have been recorded by other observers. The long delay between the trauma and the appearance of symptoms is ascribed to the gradual development of the central nervous lesions from the original capillary hemorrhages produced by the former in the nerve tissues.

Souques, M. A. AMYOTROPHIC LATERAL SCLEROSIS OF LONG DURATION. [Revue Neurologique, January, 1920, Soc. N. d. P. Seance, January 8, 1920.]

Report of a case in a woman in whom the affection began at the age of 21 years and had lasted ten years. The usual duration of cases of

this trouble is two or three years. Sicard remarked that the prognosis in amyotrophic lateral sclerosis could be measured by the severity and extent of the fibrillary contractions. In this case they were very rare. [Camp.]

Bielschowsky, Max, and Unger, Ernst. SYRINGOMYELIA WITH TERATOMATOUS AND EXTRAMEDULLARY BLASTOMATOUS FORMATIONS. [Journal. f. Psychol. u. Neurol., 1920, Vol. 25, p. 173.]

The authors describe a case of syringomyelia which throws light on certain features of this disease about which there is still controversy. From the clinical symptoms the diagnosis of extramedullary tumor of the upper cervical region was made, which was completely confirmed by the autopsy. Brown-Séguard complex occupied the foreground of the clinical picture to such an extent that the symptoms of syringomyelia were overlooked. The section revealed a gliosis extending from the lower dorsal medulla to the medulla oblongata connected with a deposit of mesenchymal and epidermal tissue elements in the substance of the spinal cord. At the level of the upper cervical segment a true blastoma had developed, rich in cells and of rapid growth, which had proliferated in proximal direction up to beyond the level of the decussation of the pyramids. At the level where the gliosis approached its greatest extension, from the posterior periphery of the pia a mass of vessels with fibrous thickened walls and accumulations of connective tissue were discovered. These formations in places consisted of pure mesodermal elements and, in some parts, of dermatoid structures combined with fatty substances, together with loose connective tissue of subcutaneous character containing hair ingrown with giant cells of foreign bodies in abundance and cysts with epithelial content. The vessel fibrosis, the deposits of connective tissue and the cutaneous substance were related formations and nowhere was there any definite boundary discernible between them. From their arrangement the author infers that they are partial phenomena belonging to a complex which, in its totality, has every sign of being an abnormal condition arising from a misplacement of embryonal germinal cells. Gerlach from study of a similar case saw evidence in a like formation that the connective tissue covering the syrinx could also be derived from heterotopic elements of embryonal dermal substance. Teratoma formations in the spinal cord are of rare occurrence and most rare of all are those with dermal elements; so far as the author knows no other case of this sort has been described in an individual having passed the thirtieth year of life. The case is further of interest because a true blastoma grew out of the teratoid mass. Upon the ground of their findings and pathogenetic researches the authors come decisively to the conclusion that syringomyelia and gliosis are essentially the same process, developing on a ground of early embryonal pathological tendencies. These disturbances are never caused by exogenous injuries of the central organ. They are due to defective processes in the closing of the em-

bryonal medullary canal and to the heterotopic development of germinal cells; they may be called metaplasms (in contradistinction to neoplasms). The fact that syringomyelia is a progressive process cannot be adduced in disproof of this view. From the standpoint of general pathology, gliosis and syringomyelia resemble the cutaneous nevi which are almost universally acknowledged to be malformations of the integument due to congenital tendencies. There is no such thing as a syringomyelia or gliosis acquired in postfetal years. Loss of substance in the spinal column in postfetal years may be caused by various malacias, and these defects may assume the form of long hollows, but they are never connected with misplaced germinal elements and never develop progressively. Hematomyelia is no exception to this rule. Secondary hydromyelia after compression is connected with a slight anomaly in the closing mechanism of the medullary canal but the phenomena of proliferation in the ependymal elements are of very different character from those in syringomyelia. Examples from recent literature are cited showing the connection of syringomyelia with other signs of hereditary degenerative tendency. [J.]

Tilney, F. EVOLUTION AND FUNCTIONAL SIGNIFICANCE OF MEDULLA OBLONGATA. [Neur. Bull., November-December, 1919.]

The author gives a functional review of the medulla and concludes that the gray matter of the medulla embodies a dominant autonomy over the vital processes of life. It mediates an essential control over respiration, cardiovascular activity, phonation, articulation, deglutition, digestion, secretion and metabolism. It also acts as an important relay station for the auditory nerve. The white matter of the medulla represents the continuity in all of the major conduction paths which serve to maintain efficient relations between the receptors and effectors of the body. The medulla is not only traversed by many of the most important afferent and efferent pathways of the nervous system, but is the site of decussation of several systems of fibers, notably the mesial fillet, Deiterospinal, olivocerebellar and pyramidal tracts.

Dibbelt, H. PSEUDOBULBAR PARALYSIS IN CHILDREN. [Arch. für Kinderheilkunde, October 11, 1919.]

Two children of 6 and 8 with spastic diplegia of a severe form are here reported upon. The disease is considered either congenital or as developing soon after birth. Eye symptoms were absent and the intelligence was average. In the thirteen cases on record with necropsy findings some defect in the cortex was apparent. Orthopedic therapy by strengthening the antagonist muscles, with possibly surgical measures for spastic contracture is indicated. Patience and perseverance are indispensable to train other synergistic groups to substitute for the lacking cortical associative pathways.

Book Reviews

Hübner, A. H. DAS EHERECHT DER GEISTESKRANKEN UND NERVÖSEN. Bonn, A. Marcus and E. Webers Verlag, Dr. Jur. Albert Ahn. 1921.

Hübner enters upon a field of study in this little book which presents a crying need to psychiatrists and jurists everywhere. It represents as he says the needs of everyday people, the masses who fill our cities or anywhere attempt to satisfy both their sense of justice and at the same time their economic demands and their irrepresible hunger for life. Laws designed to help in the maladjustment arising out of mental and nervous disturbances are too often too generalized or too limited to fit particular cases. Hübner as a psychiatrist has inquired one by one into these laws which he sets down in this little treatise. Although these are the statutes of another country his detailed comparison of them with the existing situations which they attempt to cover is a stimulating exercise to anyone interested in his purpose. This he states is to give a more scientific basis for the making of such laws in the future and for applying them to the cases in need of help.

Hübner's psychiatric statements in regard to the individual situations coming under the laws are very brief. They suggest that the problems involved might with value have received much fuller interpretative treatment both psychologically and psychopathologically. For he himself recognizes that the personal and social involvements psychologically as well as more technically are many and varied. They make apparent the difficulty confronting a code of laws and the necessity for deeper knowledge on the part of makers of laws and those who must apply them. They put the same responsibility of knowledge of these conditions and ability to take all facts into account upon the psychiatrist who must furnish definite diagnostic aid. It is the psychiatrist, as Hübner shows in himself, who will most keenly feel the responsibility that this brings because of his intimate knowledge of varied personal factors pertaining directly to mental disorders as interfering with married life or pertaining to the many other factors of the married state. The book is of interest from the comparison it offers with these laws of another country and the progress they have made or the defects they still show toward practical help for the people. It is chiefly of value as a stimulus to psychiatric and juridic attention to the everywhere existing discrepancy of laws about marriage and the facts of human lives concerned in the institution. It should be a stimulus to the psychology lying behind both psychiatry and jurisprudence and then to the direct responsibility of both professions to action upon the same.

Goldberg, Jacob A. SOCIAL ASPECTS OF THE TREATMENT OF THE INSANE. BASED ON A STUDY OF NEW YORK EXPERIENCE. Studies in History, Economics and Public Law. Edited by the Faculty of Political Science Columbia University. Volume XCVII, No. 2, Whole Number 221. New York, Columbia University, 1921.

Goldberg's work is designed to fill out just that practical need which he recognizes. It therefore offers to any individual or group interested in the problems of the mental hygiene of a community a review of certain facts essential to know. He has chosen those of a particular group in one special community not because of any particular theory but because of his own working experiences with such a group. He has taken as merely typical of conditions at large a number of cases of insanity among the Jews and pressed home the needs of better understanding and more adequate facilities for meeting the problems of mental disease in New York City or anywhere else.

He reviews as a background to his study the history of the policy of New York State in the care and treatment of the insane. His review recalls again the ignorance of the past, the slow progress into better knowledge of mental diseases and the great difficulties to be overcome in the handling of so vast a problem as that under consideration. Later he makes a survey of the present state of conditions, the facilities for hospital care in public and private institutions, the inadequacy of present arrangements to cover all the needs of the situation. He gives a brief statement of the nature of various forms of mental disease with the likelihood of cure, of relapse and of return to hospital treatment of the individual forms. This is supplemented by a statistical study of the cases which form the practical basis of the work.

All this brings into prominence the demand of the hour for more complete work on each individual case. As facilities exist now there is not sufficient provision for early diagnosis and care. So he pleads that there should be provision made for preventive psychopathic work in the form of temporary detention for observation and treatment which would often prevent incipient cases of mental disturbance from developing into more serious conditions. After care of patients dismissed from hospitals as well as attention to the families during the absence of some important member in the hospital should occupy the serious attention of those with the welfare of the community at heart. The pith of the matter is the real cure of the mental disorder and the getting of the patient back into a lasting relation to society. With the lack of time and means of various sorts the hospitals hurry through their work when from the point of view of the rehabilitation of the patient it is far from completely accomplished. This is a short-sighted policy. A more complete view of the situation reaching from the prophylactic observation to the long after care would be far better economy to society in material ways and in the far more important saving of mental ability.

The book is very practical. It treats of simple problems which should be foremost in a community, certainly in the efforts of those interested in the actual work of mental hygiene. One could wish that Goldberg had touched with greater emphasis upon the actual meaning of these mental disturbances in terms of the dynamic effort of the individual in his struggle to adjust to society and his own needs. Such an understanding should continually be forced home upon all who have these problems under their care. It needs to be impressed as the basis of all forms of the work.

Pratt, James Bissett. *THE RELIGIOUS CONSCIOUSNESS. A PSYCHOLOGICAL STUDY.* New York, The Macmillan Company, 1920.

The field of religion is a rich one in which to watch the complex activities of the human mind. To the really inquiring psychologist, whose psychology is a tool for fearless investigation, a title such as that before the reader rouses an expectant interest. The manner of the book and its contents will not fail to guide that interest beyond the brief preface which the author slyly offers the reviewer as a substitute for further reading. The dignified simplicity of the style and the successive unfolding of the meaning of religion, its place as a subject of psychological study, its part in the lives of individuals and then its various forms of manifestation and the phenomena belonging to these will sustain such interest to the end.

It is true that the author has not eliminated all his own bias in regard to religion and these its manifestations. It is a part of religion as a manifestation of the human mind that this would be impossible in any writer and that the views of one person could not help to some slight extent at least in hindering him from a complete scientific study. The science of psychology more than any other has to acknowledge its difficulty in holding the matter of its study in a completely objective position. Yet the writer in this instance has sought to deal openly. He has so frankly admitted limitations and then so freely permitted differences of opinion that he has laid the way only more open by his study for further scientific investigation and committed no one necessarily to follow any deviations from so strictly scientific a course. He seems to claim certain protective conceptions to which he occasionally shows a tendency to turn. The reader is just ready to push on with him into the deeper issues of an investigating psychology when he finds the author stopping to assert certain believed objectivities lying temporarily or altogether beyond the reach of psychological study.

Pratt just suggests the dynamic possibilities of the human mind, of the tendency of "the will to believe" to make its own standing ground. He seems not to have entered with clear understanding into the nature of the unconscious, its content of wish impulses and a mechanism for utilizing them. Freud is a frequent authority quoted by him, sometimes in agreement, sometimes in mild disagreement, but he has not discovered that Freud brought to light the unconscious content and its mechanisms in such a manner that they

are means for investigation more accurate and further reaching than Pratt has practically realized. Therefore some of those who want to avoid too complete a psychological investigation of the religion which covers over a complete knowledge of their own mental activities might find in his writings justification for closing their eyes to further courageous investigation. Others might be disappointed that the investigations were carried just so far and no further. It is rather misleading that the writer seems to set such store on emotional experience in itself without insisting to himself and others what is needed in order to maintain and really, to assert the immeasurable value which emotion undeniably has. Emotion should be willing to submit to the guidance of an intellect unwearied in its efforts to understand and explain that emotion, its origins and the effects of which it is capable. These effects in religion need careful scrutiny lest they are only protective covers preventing renewed effort to find one's own clear way. Pratt acknowledges the craving of the human psyche to find safe and sure holding place for itself but more or less lets that stand. That such wish has confusedly restricted action upon reality he fails to emphasize sufficiently or at all.

It is necessary to criticise this attitude of his that one may reach the positive value of the book and so be free to utilize the valuable matter in the history of religion, in its various individual manifestations, its various cult forms, the outer and inner meaning of cult, the various phenomena which accompany religion, prayer, worship, the mystic experiences, all of which the author presents briefly historically and more fully as material for his psychological examination. His definition of religion is a simple pragmatic one for his study used to set the subject and the religious person before the psychological lens. The book is exceedingly well written and furnishes a purely intellectual pleasure aside from the psychological interest which it rouses and in part directs.

Placzek, Dr. med. DAS GEHILICHTSLEBEN DER HYSTERISCHEN. EINE MEDIZINISCHE, SOZIOLOGISCHE UND FORENSISCHE STUDIE. Bonn, A. Marcus and E. Weber's Verlag. Dr. jur. Albert Ahn. 1919.

This book is worth attention from any one of these points of view which the subtitle sets before the reader. What is more it will fully repay examination in the exceeding interest of its matter as well as in its finished presentation. There is no reason why technical works should not gain greatly in force of appeal when they attain a distinctive literary quality. Placzek is a writer to whom such a style seems to be his natural form of expression. His readiness of statement imbued with his own interest carries his reader along rapidly over a wide range of facts in a wide field in such a manner that they are quickly grasped and interest is awakened for further pursuit.

The author has dealt generously with the opinions of many men who have written of hysteria, those of antiquity but particularly

those of the present day. He has given abundantly yet never too profusely of the history of these other writers' investigations and conclusions. His own support of these or his difference from them is modestly inserted. Sometimes it may be too much so for one sometimes has to look twice to discover just which is the present writer's comment. Yet on the whole the book begins with a valuable recapitulation of the history of hysterical theory and its status at the present time. It then proceeds to a description of some of the outstanding manifestations of the hysterical character, particularly those of interest from the sociological and forensic point of view. There are inserted a number of histories of cases well known in the forensic world. Then follow also interesting chapters of a more general discussion of the relation of the sexual life of the hysteric toward society, of the questions of criminal and civil court proceedings in relation to this group, of the ability of hysterics to meet various civil and forensic functions, such as carrying on business on the one hand or giving testimony on the other. A very suggestive little chapter deals with witchcraft as an hysterical phenomenon, its manifestations and belief in it as depending upon hysterical conditions. Placzek interestingly points out how such witchcraft still exists individually in certain hysteric characters.

All this is not to say that the medical aspect as such is neglected. These sociological problems are approached by a physician whose thoroughly medical viewpoint forms the basis and fabric of the discussion. He has particularly discussed certain manifestations which are best understood and estimated from the medical point of view, and he has discussed in some detail the general aspect of the hysterical woman and of the hysterical man with a physician's interpretative insight. In all it has been Placzek's chief endeavor to lay emphasis upon the sexual life of the hysteric. This indeed is the purpose of his book, to bring to bear his medical knowledge and experience to force before the world of physicians, judges and all social workers the prevailing importance of the sexual aspect of the hysteric's reactions. He accepts with a calm reasonableness the undeniable existence of the sexual in their problems. He believes that too great emphasis cannot be laid upon this in the understanding of hysterical reactions in their relation to society and that only upon such recognition can an effective handling of their problems be attained. He shows that sexual conflicts were manifesting themselves in all the cases presented. He speaks rather of results of sexual conflict in these manifestations however and not particularly with a view to understand the underlying activities which make the sexual a cause of these phenomena.

This is good as far as it goes. It is of great importance that one of such breadth of view and soundness of judgment should impress upon the attention of physicians and jurists the sexual character of these manifestations which as the writer points out have too long been strangely overlooked. Closer attention however to the other side, the etiological, would have brought him in still more complete agreement with Freud. A deeper appraisal of the sexual

in its etiological ramifications would lead further and further back into a better comprehension of the full meaning of the Freudian investigations. This writer like so many seems not quite able to grasp the dynamic unfolding of a character which includes the sexual as an all pervasive factor like the sap of a tree indispensably permeating every branching of root and stem. With this comprehension it would be easier for him to see what Freud means by asserting sex in all activity and its inhibitions and distortions as the explanation of hysterical or other mental disturbances.

Placzek approaches the Freudian theory. He understands for himself many of the principles on which it is based. Not ready to go with it all the way he has however given it perhaps the fairest criticism it has received. He has spoken high praise of Freud's service in awakening the medical profession out of its falsely protecting blindness in regard to the prevalence of the sexual and he acknowledges the debt which hysteria in especial owes to this investigator. His warning against the dangers which psychoanalysis offers in the hands of any and everybody intimates some confusion in his mind of its methods with hypnosis. Yet the warning is one which it will harm no psychoanalyst to take to heart. His whole attitude toward psychoanalysis is enough of a criticism to arouse a genuinely inquiring interest. It does not set up that barrier of defensive antagonism to which we are well accustomed.

Certain points of emphasis might be noted. There is that growing view of the hysterical reaction and character which banishes a limiting disease term. This arises out of a certain comprehension of the dynamic activity which creates hysterical symptoms and therefore leads in the right direction although one could wish this had been pressed more deeply etiologically and therefore interpretatively. Placzek warns also against accepting a limited definition of the hysterical as distinctively sexual. He discards the older more limited conception of the identity of hysteria and sexuality only to point out the center of truth there was in this idea. Then he proceeds to open up the farreaching relationships which pertain through the inner secretions as well as in the psychic reactions, making thus the sexual life of the hysteric a problem extending into a very wide field. Medical facts, psychic truths are touched with a sure hand. They are thus grasped by the writer's knowledge, experience and breadth of view and are thus presented to his readers. He has made practical application of them in a book of special value in its several directions.

Stekel, Wilhelm. DIE GESCHLECHTSKÄLTE DER FRAU. EINE PSYCHOPATHOLOGIE DES WEIBLICHEN LIEBESLEBEN.

DIE IMPOTENZ DES MANNES. DIE PSYCHISCHEN STÖRUNGEN DER MÄNNLICHEN SEXUALFUNCTION. Berlin and Vienna. Urban and Schwarzenberg, 1920.

The value of these two books is best appreciated if they are allowed to supplement each other. They together form part of a

larger series of writings by this prolific author, the entire series devoted to the filling out of necessary knowledge in the sphere of the psychosexual life with its difficulties. The importance of these two particular volumes cannot be overestimated. The field is one where blindness has reigned in regard to the factors actually at work to cause disturbance and the real features of such disturbance. Too little account has been taken of the essential significance of full sex functioning to the psychic health of men and women and to their ability to fulfill their domestic and social functions.

Stekel's presentations are so utterly fearless that he passes beyond any mere objection to so full a treatment of details in sex relations. The seriousness of his conviction in regard to the prevalence of the disturbances of the sex life summed up in impotence and frigidity forces upon his reader something more than a prurient interest or a carping criticism of so detailed an exposure of difficulties. To those who would prefer entirely to overlook the importance of disturbances, of the sex function or to attribute them to reasons to be got at with less effort these books present nevertheless an array of facts and some very pertinent conclusions of the author which are fitted at least to rouse searching question. The material presented cannot be carelessly passed by.

Stekel's facts come thick and fast in the abundance of his well recorded case histories. His conclusions are not dogmatic. They too are struck off in the face of situations which cannot be gainsaid even though one might refuse to agree absolutely or even approximately in interpretation. Even when one allows for some personal bias, which perhaps belongs inevitably to an intense interest in a long pursued mode of treatment, one has first to disprove results as well as otherwise satisfactorily explain the facts which case histories reveal before one can disregard the pleas which are here made for psychoanalytic interpretation and psychoanalytic treatment. Certain points of definition, of conclusion, certain details of method might fall under criticism even by his colleagues in this field. And they do. Stekel's work is not always strictly psychoanalysis. Sometimes one finds the evidence of his own forceful personality in such a departure from the method that would not be advisable in less skillful hands. The authoritative word has to be used very judiciously but Stekel himself is careful in his choice of such method and candid in admitting its use wherever this has been the case. At the same time he discusses other forms of treatment in a comparison with psychoanalysis showing the advantage in the latter.

He speaks often of the all too frequent limited diagnosis of impotence and frigidity, particularly of the former, and the attributing of these conditions to physical or other superficially apparent causes. In all instances he finds them psychically determined. In the patient they are usually rationalized upon some limited cause even in psychic experience. Naturally masturbation is one frequently chosen or one which similarly enters into the patient's feeling of nemesis for self injury or unfaithfulness of the self in some direction. Stekel shows how psychic causes, early experiences, splitting of

libido attachment, conflict of opposing tendencies are operative in a much further reaching manner and degree than such partial explanation would suggest.

Not only do the case histories pass rapidly before the reader. They are brought home by many pregnant statements which arise out of the understanding of the cases and which also throw clearly before us the problems which they represent. Deeply underlying sex disability in man or woman is the "will not" which comes into conscious experience as a softened "I cannot." This fact the writer continually brings to the front. In truth what is the work of psychoanalysis but to reveal to the patient what his wishes, his wills really are? In these histories as elsewhere it is discovered that the patient, man or woman, is governed by deeply hidden wishes which conflict with that which consciousness narrowly recognizes.

Stekel shows how often in the male or the female the conflict is due to something less deeply imprinted in life than a remote infantile situation. He speaks of the traumata of the adult as of great significance in determining the sex reaction. The first sex experience, for example, is of great moment in setting the current of love or of an unconscious hate in the later sex response. The will to power in either sex is here deeply involved. Stekel significantly states that a woman for instance never forgets the man to whom she has first completely yielded herself. Her first complete love experience is all important to her and if she shall have yielded herself without the resulting orgasm her unconscious hatred cannot forgive. Often with the male the impotence is a temporary reaction, if the patient but knew it, due to a fear of the first marriage relationship or of the bondage of the marriage into which he is entering. In all these conditions the situation is much the same with man or woman.

Often however the situation has much more complicated factors behind it. Stekel takes more than one occasion to differ with Freud upon the need of searching for causes particularly in the infantile and the giving of them too rigorously an infantile interpretation. Yet he too continually finds causative factors which have been operating from relationship to parents and other early experiences. He lays stress upon the religious factor as playing a large part in the causation of impotence. This may mean a persistent unconscious obedience to earlier religious authority, consciously outgrown. It may be a moral attitude conflicting with a present situation. It may and frequently does have a superstitious form in the fear existing in regard to the breaking of some vow entered into earlier in regard to sex choice or sex activity. These instances are entangled with obedience to parent authority and sometimes involve a death wish. Stekel in one place sums up the factors in general which interfere unconsciously with complete sex function. They are to be comprised, he says, in infantile fixation, hatred toward the partner, moral inhibition and homosexuality.

He shows how frequently the latter is operative in either sex when an unconscious fixation on one's sex prevents the acceptance

of the opposite partner. His reference to the accentuation of this difficulty by war conditions is particularly suggestive. Men were segregated from women for long periods and learned to get along for a time at least more or less completely without them. Mutual interests of their own sex were stimulated and given independent activity. The same was true of women. Besides with women they are struggling for the emancipation in the field of higher opportunities, they demand a love that shall be both psychic as well as physical. In fact Stekel, while he sees the danger of the homosexual withdrawal and its strengthening of an already existing antagonism to heterosexual love, acknowledges unhesitatingly that what men and women need is this same heterosexual love and that nothing can really satisfy them or cure their sex hindrances but its complete form in union of the psychic and the physical. To this end he pleads with all the force of his convincing experience and with that highmindedness which characterizes all his writings. He calls upon society to recognize the state of things. He summons physicians to recognize where the disturbances really are at work. He challenges forces of society to permit of a greater freedom for men and women to find the true love object or to change this when in the course of events love has transferred itself. Yet while he pleads for a lifting of the unyielding pressure that is largely responsible for the present state of affairs, Stekel has a wholesome faith in a true love, if it has space to breathe more freely, to find its own fuller union and therefore be less subject to change and transfer than under present hampering conditions.

The books are exceedingly stimulating to serious thinking. Medically they will bear careful perusal, and sociologically they demand conscientious consideration. They have much that is illuminating to any reader in regard to his own psychic makeup, whether bearing directly on sex difficulties or not. Mention should be made also of some specially definite medical discussions such as those on the more physical aspect of impotence, *ejaculatio praecox*, priapism, the chapter on pollutions by Dr. Tannenbaum of New York. To be sure these discussions are more psychological than strictly medical but Stekel makes sufficiently clear the inextricable relationship of the two phases of the problem. The books like the others of Stekel's contributions form an invaluable part of the literature on the psychosexual life from many points of view.

Loosmore, W. Charles. NERVES AND THE MAN. A POPULAR PSYCHOLOGICAL AND CONSTRUCTIVE STUDY OF NERVOUS BREAK-DOWN. New York, George H. Doran Company.

The subtitle of this book gives text for its criticism. Popular it bids fair to be. Psychological it might be accepted to be by some who can find it easy to apply that word to almost anything. Constructive—only if construction means the laying on of some certain adorning plaster with no framework, surely with no deep-laid foundation underneath. The book is a marvel of fine phrases. It is one

of those pieces of writing that make one sigh for a destroying gale to sweep away all but the barest facts and simplest of "nervous breakdown" that the public may think and work upon those alone. If one could merely smile at the platitudes, the "don'ts," the soothing advice, the book could remain harmlessly on the shelves and even go its popular way. But such books are pernicious in that they uphold the impossible. They catch by their fine phrases the ears that should be listening more closely to the straightforward truths of nervous and mental distresses and getting at them hard and fast in their very strongholds. Good advice some of it in these platitudes, but how is the distraught sufferer actually battling with inner factors going to accept and apply them. Suffering men and women need facts about the sources of their actual sufferings, not palliations that only cover over the straining places.

Ash, Edwin Lancelot. THE PROBLEM OF NERVOUS BREAKDOWN. New York, The Macmillan Company. 1920.

Criticism unsparing should meet such a book as this. This is not to manifest ill intention toward the writer or others of his kind. It is to utter a serious warning to him and to safeguard more completely just those whom it is his well-meant intention to reach. The world of nervous sufferers and of the perplexed physician and nurse who must meet such suffering cannot endure such half made statements, partly true but then half retracted and modified until they become meaningless. Nothing is entered into deeply enough for such a serious subject and the manner of treatment results in too many misstatements to be a safe guide or even an instigator toward the practical dealing with nervous disorders. The book can make no contribution to the science of neurology. For the general practitioner or the actual sufferer it is too incomplete in its handling of its important subjects and too little pointed in its therapeutic approach to be other than misleading.

There are certain excellent statements. The writer himself has some grasp of the far-reaching etiology and the complicated manifestations of nervous troubles. He has some idea of the need for emotional expression lying behind all such derangements. He admits the psychic impulses operating behind what appears as nervous disorders. Yet admitting this he returns to his first assumptions of weak nerves and drags them constantly into the discussion as if this were the finality of the matter. He forgets his own statement to the effect that nerve tissue itself is remarkably hardy and that psychic factors behind the physical machinery must be taken into account. He spreads the term neurasthenia in every direction. Wherever he has discussed definite manifestations of disorder the matter has been so insufficiently treated that it would have been better in the interests of actual understanding and therapy to have let it alone. Because of his insufficient penetration into all phases of the subject his case illustrations are only superficial, contain no suggestion of help. The measures he advocates are based on that dangerous "little knowl-

edge" which uses these measures only to gloss over the facts really to be got at. Such books are written by men who desire to help. They bring home most forcibly the need in the profession and out of it of hard, vigorous wrestling with such problems, a wrestling that will not let go until the inner marrow is found.

Robie, W. F. SEX AND LIFE. WHAT THE EXPERIENCED SHOULD TEACH AND WHAT THE INEXPERIENCED SHOULD LEARN. Boston, Richard G. Badger.

The sincere altruistic purpose of this book as well as its genuine recognition of the importance of sex to every life are to be commended. The importance of sex is emphasized in the responsibility that this thrusts upon physician, patient and reader, upon every one to teach or to learn and then healthfully to live by the facts of sex. Robie is not afraid in his personal contact with patients and in talking to the public through his book to bring forward those details of which sex consists. He proclaims the good results of such a sane handling of sex facts, he gives the experience of a variety of men and women to prove both the everywhere prevalent interest in sex and the need for more practical knowledge in regard to it. He presents certain psychological and ethical principles and maxims.

Yet his psychology is not deep enough nor broad enough to make his work as complete as it should be. There are more complications surrounding the love life and more factors entering into the sex impulse and its various manifestations than he takes into account. He has done service in freeing masturbation, which he prefers to call merely auto-erotism, from the stigma from without and the reproach from within which have centered about it much of the neurotic difficulty resulting from sex. Yet by not relating the matter itself more completely to the personality he makes the problem appear too simple. The various conflicts, the difficulties bound with the continual struggle between merely personal or ego libido and the creative libido of which sex function is the chief manifestation are not taken into account. One following his advice without full consideration to those many factors of conflicting goals within oneself and in one's relation to the social group might still find his difficulties unsolved. As it stands the advice swings auto-erotism out of proportion largely because it does not fully discuss it in all its meaning and all its bearings. These would only be found in that deeper penetration into the whole psychic background which Robie thinks unnecessary, that "one stage farther" in dealing with sexual problems and the experiences with which they are related which Robie commends in the Freudians but feels it unnecessary to bother himself about.

Karplus, J. P. VARIABILITÄT UND VERERBUNG AM ZENTRALNERVENSYSTEM DES MENSCHEN UND EINIGER SÄUGETIERE. Zweite umgearbeitete und vermehrte Auflage. F. Deuticke, Wien.

In 1907 the first edition of this extremely valuable and precise piece of work was offered and reviewed in these columns.

Since that time the author has had greatly increased opportunity, through a rich material, to enlarge his comparative studies. He here gives us the most up-to-date and authoritative presentation of the morphological evidences, external and internal, of variability and heredity in the passing of structure of the nervous system through the animal phylum. It is a study that all students of the structure of the nervous system should have.

Marañón, G. IN NUEVAS ORIENTACIONES SOBRE LA DIABETES INSIPIDA. Editorial Saturnino. Calleja, Madrid.

In a delightful little monograph Dr. Marañón has gathered together a number of observations with a complete discussion of the hypophyseal relationship to diabetes insipidus, its pathology, etiology, symptomatology, diagnosis, course, prognosis and opotherapy.

Towns, Charles B. HABITS THAT HANDICAP. Funk and Wagnalls Company, New York and London.

There is plenty of room for this more than interesting book. The ever-present tendency for the human being to avoid the painful tensions of continuous effort by taking "something"—a pick me up, or something soothing or alleviating usually lands all of the discontented and many of the semi-contented into the fatal ambush of some type of drug habit. Like Narcissus of old they ultimately return to a state of self comfort, periodically or continuously and "lose their eyes," i.e., lose their creative capacities and become slaves to a routine of a monotonous boredom, broken now and then by some episodic debauch of feeling, or nerves, or risky conduct.

The general features of the resultant conditions are here well told and we can commend this small brochure to our readers. We would have liked to see more insight into the psychopathology of the conditions and less material upon the mechanical features of the cure advised, but the world is only slowly coming to view man as a unity—his cravings and his machine as inseparable—and until this is realized the easier method of approach here offered may after all do more good.

Hollingsworth, Leta S. THE PSYCHOLOGY OF SUBNORMAL CHILDREN. The Macmillan Co., New York.

From every point of view the study and training of children is the supreme obligation of the state. The recent movements towards a better understanding of educational problems relative to the feeble-minded is one that occupies a regnant position in this obligation and any study or series of studies that intelligently furthers such an understanding deserves support. The present volume is such a one. It is intelligent and at the same time very practical. It is good reading and for the most part dynamic thinking. It is stated in simple terms, avoids many of the "truths that are not so" and altogether is, for its purposes, a commendable book. If the author had used "average" more and "normal" less the book, in our opinion, would be even still better. A few points concerning which

the author is unwisely dogmatic are those concerning heredity, objectively controlled experiments, and optimistic faith in so called "measurements." Something useful and valuable might have been said about the influence of psychological factors—family conflicts and repressions—in causing feeble-mindedness, and a little wider acquaintance with endocrinopathic dyscrasias other than the thyroid alone, especially the gonadal inferiorities, would have given it a better rounding out. The best feature of the book is its evident sympathy with the problems on the basis of actual experience, especially in its utilization of pathological (non average) material to understand the average and its deviations.

Miller, H. Crichton. FUNCTIONAL NERVE DISEASE. Oxford University Press, London.

This is an extremely readable series of essays by well known British observers who were forced by the war experiences to learn something about the psychoneuroses.

Practically no civilized country had been so backward in psychopathology as had been Great Britain in spite of the transcendent genius of Hughlings Jackson, the dynamic attitude of Maudsley, the useful generalizations of Herbert Spencer and the preeminence of their physiological investigators. Fortunately the war woke them up and as the author indicates in his preface they passed rapidly from the massage, electricity nonsense through the rest cure—suggestion—stage, to a real analytic period whereby some understanding of human conduct was possible through actual experience and not from the University psychologists.

The results as here outlined are indicative of a real progress in psychopathology and although the essays are somewhat uneven they will prove valuable to the general practitioner.

Ceillier, André. PARA-OSTEO-ARTHROPATHIES DES PARAPLÉGIQUES PAR LÉSION DE LA MOELLE ÉPINIÈRE ET DE LA QUEUE DE CHEVAL. Imprimerie Générale Lahure, Paris.

These studies made during the war chiefly with Mme. Dejerine have been discussed in our abstract columns from time to time, appearing as they have in current issues of the *Revue Neurologique*. They are here gathered together in a masterly monograph which no student of neurology and of the relationships of spinal injuries to bony metabolism can afford to neglect.

They mark a distinct advance in our knowledge of methods of investigations of spinal segmental distribution, of the localizations of the vegetative arcs involved in bony metabolism, especially of the less fixed joint disturbances, and constitute a field of new research of enduring nature.

Porot, A., et Hesnard, A. PSYCHIATRIE DE GUERRE. Félix Alcan, Paris.

The great avalanche of works which has descended upon the reviewer's desk following the armistice counsels us to moderation

in space both from the necessity of appraising their contents and of saving the reader's time.

This small work we should like to dwell upon if it were possible since the authors have boldly announced their intention to get away from a "psychiatric static"—a psychiatry of nosologies and classifications to a "psychiatric dynamique" one of processes and causes. This they have done very satisfactorily and hence have made a real contribution to the psychopathology of war conditions. We commend it in the highest terms as one of the books that can be read to advantage although they have not been able to get to an analytical psychopathology as much as seems* desirable.

The general type of psychical splitting which in its exaggerated and bizarre forms is so readily recognized and here so finely described, is extremely widespread in every community, but hidden under hosts of rationalized symbolic substitutes which at the present day pass as quite reasonable, and are dealt with as various types of religious, philosophical, mystical, health movements, etc. In Bleuler's rather more interpretative monograph on Schizophrenia, the outlying boundaries of Dementia Praecox receive more extended survey. It would be of signal service if some publisher would put forth a translation of Bleuler, when with this excellent text of Kraepelin this protean mental distortion would stand revealed and could possibly be coped with and partly conquered.

Friedländer, A. A. DIE HYPNOSE UND DIE HYPNO-NARKOSE. F. Enke, Stuttgart.

In one hundred and twenty-one pages the author discusses Hypnosis and Hypnarcosis, for students of medicine and for those who would practice this form of Psychotherapy. It differs in no essential respect from the usual teachings with which neurologists are fully familiar and from which most are departing. With the intimate psychological processes which underlie the suggestion phenomena the author shows no real acquaintance so far as this text is concerned.

Chowrin, A. N. EXPERIMENTELLE UNTERSUCHUNG AUF DEM GEBIETE DES RÄUMLICHEN HELLSEHERS. E. Reinhardt, München.

This is a work from Russian sources, originally appearing in 1898 under the title of "Rare Forms of Hyperesthesia and the Higher Sensory Organs." It chiefly concerns itself with the investigations by A. N. Chowrin, First Assistant in the asylum Tambov, of a case of a young woman 32 years of age who was able to read unopened letters, distinguish colors in the dark by touch, and other types of synesthesiæ. The details must be consulted in this small monograph of eighty pages. It is translated by v. Schenck-Notzing, whose interest in this group of phenomena is well known.

Brousseau, Albert. *ESSAI SUR LE PEUR AUX ARMEES.* 1914-1918. Félix Alcan, Paris.

While the study here has not the dramatic value, nor the artistic insight of that shown in Andryeff's *Seven who were Hanged*, nevertheless his very sympathetic and fertile study of fear as he observed it among his fellow soldiers and in himself may be accorded high praise.

He lived three and one half years in combat; thrown into contact with all classes. Month in, month out, he and his associates faced death, imminent and prolonged. These experiences he has here attempted to place before the reader in this short monograph. He has sketched the multiplicity of the phenomena observed and paid particular attention to the effect of fear upon the dissociation of the personality. The capacity of the individual to integrate his fear with his consciousness determines the differences in the individual's conduct. He describes very succinctly what is well understood as suppression and repression, partial or complete, in present-day psychopathology. A readable and agreeable essay.

Thewlis, Malford W. *GERIATRICS. A TREATISE ON SENILE CONDITIONS, DISEASES OF ADVANCED LIFE AND CARE OF THE AGED.* C. V. Mosby Company, St. Louis.

Geriatrics has begun to be a specialty in medicine and this manual of some 250 or more pages is an evidence of it. There is little to say about it save as to its simplicity and good common sense. Senile psychoses are not dealt with adequately.

Lessing, Oscar. *INNERE SEKRETION UND DEMENTIA PRAECOX.* S. Karger, Berlin, 1921.

The author here brings together a series of detached suggestions in essay form tending to ally the general problem of dementia praecox with endocrinous dyscrasiae without any particular success, though with much ingenuity of presentation.

Freud, Sigmund. *DREI ABHANDLUNGEN ZUR SEXUALTHEORIE.* Vierter, vermehrter Auflage. F. Deuticke, Vienna, 1920.

In the preface to this the fourth edition of this well-known and valuable work Freud states that the psychoanalytic movement has not been hampered by the war but rather the cruel experiences which came through it have served to give much verification to the central truths which he had endeavored to lay down.

The present edition has been gone over and a number of additions made, chiefly as footnotes and as amplifications of points just touched upon in former editions.

The Journal OF Nervous and Mental Disease

An American Journal of Neurology and Psychiatry, Founded in 1874

Original Articles

A CASE OF SPINAL SPASTIC PARALYSIS (PRIMARY LATERAL SCLEROSIS).*

BY I. T. BROADWIN, M.D.,

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HOSPITAL, N. Y.

A. L., a twenty-nine-year-old man, a native of the United States, and a salesman by occupation, came to the neurological clinic of the Mt. Sinai Hospital complaining of stiffness in both lower extremities. The stiffness began gradually at about twelve or thirteen years of age; it progressed rather slowly up to three years ago; since then it has remained stationary. His father states that the condition appeared to progress rather rapidly for the first three months, and then continued slowly up to three years ago. The patient distinctly remembers running about with perfect ease at about the age of seven or eight.

The family and personal history was obtained from the patient's parents, both of whom are living and well. They show no evidences of nervous disease or abnormalities in gait. The grandparents on both sides of the family were of healthy stock and died of old age. In no branch of the family is there any history of nervous or mental disease or abnormalities in gait. There is no history of consanguinity.

The parents of the patient had twelve children, eight of whom are living and well. Four of the children died in infancy of pneu-

* Presented before the Clinical Conference of the Neurological Staff of the Mt. Sinai Hospital, N. Y., January 3, 1921.

monia. None of the living or dead children showed any abnormalities in gait.

The patient was a full-term child; his mother felt perfectly well during gestation. The delivery was normal. The patient was breast-fed for one year, had his first tooth at eight or nine months, and began to walk and talk at the age of one. He had measles at one and croup at five years. No other diseases of childhood. He began school at the age of seven and left at the age of sixteen in the upper grades. He was a poor scholar and he attributes his poor progress in school to the fact that he paid more attention to street sports than to school work. He never had any convulsions.

At about the age of twelve or thirteen the peculiarity in gait was first brought to his attention by his playmates. At about the age of fifteen or sixteen he noticed that he rapidly wore out the inner sides of the soles of his shoes. At about this time he complained of pains in his feet; these pains, however, only lasted a short time and never recurred. At about this time, when already aware of the peculiarity in gait, he jumped from a height of fifteen feet, landing on his feet and falling back. On arising he noticed a sharp pain in his knee-joints, but was able to walk home unassisted. In a few days the pain disappeared. He noticed no change in his condition following the jump.

He is unable to give fuller details of the onset of the stiffness in his lower extremities, because it was slow and insidious. He is unable to state which leg was first involved and whether at any time one leg was more affected than the other. He has been working ever since he left school. He was married at the age of twenty-five. His wife gave normal birth to one child. This child on examination revealed no evidences of nervous disease or abnormalities in gait. His wife has had no miscarriages.

The patient never had any other subjective sensory symptoms than occasional transient pains in his feet. So far as he knows his upper extremities were never rigid. He suffers from chronic constipation; he has no difficulty in urination and his sexual power is normal. He is a moderate user of tobacco and alcohol. He has no difficulty in climbing stairs or walking, but he experiences considerable difficulty in maintaining his balance when he is given a sudden push.

Physical examination reveals a well-developed and well-nourished young man of about twenty-nine. His gait is spastic; the right leg appearing more spastic than the left. The legs are moved *en masse*,

as though walking on stilts, with a scraping of his feet. A slight lordosis in the lumbar region is present, the upper part of the body being thrown back. The head is normal in size and shape. The hair on the scalp is light, rather sparse and streaked with gray. The pupils are regular, equal and concentric. They react readily to light and accommodation, and consensually. On fixation to the extreme lateral planes coarse nystagmoid movements with a rotary element are noticed in both eyes. The ears show no stigmata of degeneration. The nose is normal. The teeth are well formed and in good condition. The palate and tongue are normal. The thyroid is not palpable. The heart and lungs reveal no evidences of disease. The blood-pressure is 120/80. The abdomen is normal. The distribution of hair is normal. No trophic changes in the skin. The *upper extremities* are well developed. The gross motor power is good, and there are no atrophies or spasticities present. There is a fine tremor of the fingers of the outstretched hands. No ataxia, adiadochokinesis or intention tremor. The *lower extremities* are held rigid. Considerable resistance is met with during passive movements of both lower extremities. This is more marked on the right side. With considerable effort, however, movements can passively be performed. The joints involved are the knee and ankle. There are no atrophies present and no fibrillary tremors in evidence. The gross motor power is well preserved. The patient can stand on his toes or heels without support. There is no ataxia.

Reflexes	Right	Left
Jaw-jerk	present	present
Biceps Tendon	lively	lively
Periosteal	lively	lively
Triceps	very lively	very lively
Knee-jerks	exaggerated	exaggerated
Ankle-jerks	lively	lively
Ankle-clonus	inexhaustible	inexhaustible
Patellar-clonus	present	present
Babinski	present	present
Corneal	present	present
Abdominals	present and equal	
Cremasterics	present and equal	

The cranial nerves are all intact. No objective sensory changes or paraesthesias. No trophic changes. Vibratory sensation normal. Osseous system shows a slight lordosis in the lumbar region and a double pes planus.

Laboratory findings.—The spinal fluid and blood Wassermann were negative. The spinal fluid was obtained under normal pressure, cell-count not obtained on account of blood being present. X-ray examination of the vertebral column revealed no abnormalities.

The positive findings in this case are (1) spasticity in both lower extremities, more marked in the right than the left, (2) a spastic gait, evidences of pyramidal tract involvement of the lower extremities, (3) lively tendon and periosteal reflexes of the upper extremities.

Conclusion.—Clinically this case appears to be one of primary lateral sclerosis (spastic spinal paralysis). The disease, as originally described by Erb, is characterized by motor weakness, exaggerated reflexes and the Babinski phenomenon. Oppenheim states that in the great majority of cases that first appear to be spastic spinal paralysis, symptoms later arise which show that behind this picture there frequently lurks another disease of the nervous system, chiefly disseminated sclerosis, chronic myelitis, combined system disease, compression of the cord and less commonly amyotrophic lateral sclerosis or cerebral disease. These facts should continually be borne in mind and an endeavor made to unmask the so-called spastic spinal paralysis. Any sign that does not strictly accord with the clinical features of spastic spinal paralysis is an indication of the possibility of some other underlying disease. Disseminated sclerosis especially tends in the initial stage, which may last for several years, to assume the character of a spastic spinal paralysis. It is therefore advisable even in pure cases of the clinical form to be exceedingly reserved in the diagnosis as to the nature of the pathological lesion.

At first the autopsies did not confirm the views of Erb and Charcot that primary degeneration of the pyramidal tracts was the underlying lesion, and although degeneration of these tracts was found, it was usually secondary to hydrocephalus, multiple sclerosis, syringomyelia or symmetrical cerebral lesions, or was part of a postero-lateral sclerosis or of an amyotrophic lateral sclerosis. The pathology, if this disease is to be accepted as entity, should be a primary degeneration of pyramidal tracts and nothing else. This degeneration may stop at any level or it may extend to the cortex.

Erb recognized eleven cases, including two of his own. Some showed degeneration of anterior horn cells, of Gowers's tract and of Goll's tract to some degree, though not enough to have apparently given clinical evidence. Spiller in 1905 described, among others, two cases with autopsy which could be regarded as a primary pyra-

midal tract degeneration. He also described a unilateral form. Strümpell, in 1907, gave the autopsy findings in three cases. Kinichi Saka, in 1908, described "a rare disease of pyramidal tracts with spastic spinal paralysis with bulbar symptoms."

The duration of the disease may be indefinite. Erb reports cases which had existed for ten to twenty years without the appearance of any further symptoms. The disease may even cease to progress. Later it often extends to the upper extremities, and if one leg has in the beginning been more involved the arm on the corresponding side will be first affected. In certain typical cases there may later be involvement of the muscles of articulation and deglutition. The spastic form of bulbar paralysis has a tendency to change into amyotrophic lateral sclerosis.

Strümpell describes an hereditary familial form of spastic spinal paralysis. It usually affects males; it begins between the ages of thirty and forty, with pure spastic disturbances of the legs, and only after a lapse of years it becomes a true spastic paresis or paraplegia. In the latter stages slight sensory disturbances especially involving thermal sensibility appear together with some bladder weakness. This constitutes an essential difference between this disease and spastic spinal paralysis and finds expression in a slight degeneration of other than the pyramidal tracts. In our case no hereditary or family factors are in evidence.

The diagnosis of multiple sclerosis is ruled out by the absence of tremors, optic nerve atrophy, initial sensory disturbances and the fact that the abdominal reflexes are present. The absence of progressive involvement during fifteen years, as well as the absence of a level lesion, sensory or vaso-motor disturbances, speak against the diagnosis of a spinal cord tumor. There is no etiological factor for the consideration of chronic myelitis. The negative X-ray findings and the absence of tubercular foci in other parts of the body exclude among other things the possibility of spinal caries. Cerebro-spinal lues is ruled out by the negative serological findings and by absence of other evidences of lues.

In the treatment of the disease division of certain of the posterior lumbar roots has been considered, also injection with alcohol of the nerves supplying the more spastic muscles. In this case it is not deemed advisable to resort to either of these two measures, inasmuch as the patient is quite comfortable. He is able to continue at his work and finds little difficulty in getting about. It is considered doubtful whether the application of massage and electricity would be of benefit.

A CASE OF PROGRESSIVE MUSCULAR DYSTROPHY *

BY E. D. FRIEDMAN, M.D.

The case here presented deserves recording in the literature on account of some findings which differentiate it from the classical types of this disease.

The patient was a school boy about sixteen years of age, born in Austria, admitted to the service of Dr. Sachs at the Mount Sinai Hospital on the 24th of November, 1920. His chief complaint was weakness of both legs for fifteen years. His family history was negative. His birth was normal. He began to walk at nine months and walked for one month. His legs then became weak and he crawled up to the age of five. After that he was able to stand again, but he noticed weakness in his legs. This persists up to the present day. There never was any pain, just a "sticking" feeling in the lumbo-sacral spine, on bending forward. The physical examination showed the attitude and gait characteristic of muscular dystrophy. There were some evidences of disturbance in the glands of internal secretion. This was shown by an overgrowth of hair at the bridge of the nose, the presence of large hands and feet, and female distribution of hair over the pubis. The facies were not definitely myopathic. The patient had a waddling gait and a marked lordosis. He got up with difficulty from the floor, but not quite like the typical Erb type of dystrophy. The following muscles seemed to be involved: the sternomastoid on the left, the right infra and supra spinatus, the deltoids (more so on the left), the left pectoral muscles, the left biceps (the serrati and both latissimi seemed intact). Abdominal muscles seemed normal. The erectors of the spine were poor. At the hip joint the extensors seemed weaker than the flexors. Both quadriceps muscles were weak. There seemed to be very little muscle tissue in the quadriceps region. The adductors of the thighs were also involved. The dorsiflexors of the feet were weak on the left, especially the extensor longus hallucis. Both knee jerks were absent. The rest of the neurologic examination was negative. Urine was negative. Wassermann in the blood was negative. Blood showed urea N 16.8, sugar 85 mgms. Basal metabolism was minus

* Presented before the clinical conference of the Neurological Staff of Mt. Sinai Hospital, New York, Nov. 29, 1920.

10. X-ray examination of the hands and feet showed that the metacarpal and metatarsal bones were shorter than normal. X-ray examination of the skull was negative. There was no enlargement of the thymus. There was no response to galvanism or faradism in the quadriceps muscles.

From the findings enumerated it would seem that this case represents a cross between the Erb type of dystrophy and the Werdnig-Hoffman type of progressive muscular atrophy. Like the latter, it began early in life, with weakness of the pelvis and the thighs, absence of deep reflexes and changes in the electrical reactions. However, in our case there was no change in the contraction formula nor in character of the wave.

That the case belongs in the group of muscular dystrophy is evidenced by the combination of atrophy and hypertrophy, the absence of both fibrillation and reaction of degeneration. The involvement, too, of the proximal muscles is characteristic and differentiates this clinical picture from the Aran Duchenne type of spinal atrophy.

The X-ray examination of this patient showed no pineal shadow. The blood sugar was normal, thus differing from the observations made recently in a number of cases of dystrophy by Janney, Isaacson and Goodhart. It would seem to the writer that the blood sugar level would vary with the amount of muscle activity which the patient could still carry on. The low values described may have been due to the fact that the patients were bedridden and inactive. There were no vasomotor phenomena present; our case thus differed from types of disease of the lower neuron.

That this disease has some relationship to the glands of internal secretion is shown by the fact, illustrated in our own patient, that the pituitary was involved, and that the bony skeleton also showed developmental defects. It is our notion that the lesion is at the neuro-muscular junction, because there is no definite symmetry in the localization of the lesion; the theory of Edinger also could not be made use of to explain the muscular involvement.

The atypical feature of this case is the absence of knee jerks. This might be explained by a lesion at the neuro-muscular junction or by some posterior sclerosis. Oppenheim has found diminished mechanical irritability of the muscles together with marked diminution of the deep reflexes. Jendrassik has described cases of dystrophy in association with Friedreich's disease.

The peculiar attitude, the combination of atrophy and hypertrophy of the muscles, are characteristic of the disease. If the face

is involved, we get distinctive myopathic facies. This is especially marked in the Landouzy-Dejerine type of muscular dystrophy.

Many types of this disease have been described and they have been named according to the author who observed the clinical picture. But these classifications are entirely arbitrary, and it would seem a much better plan to group all of these clinical types in which there is no demonstrable lesion of the anterior horn cell or its axon under the term muscular dystrophy.

The pathologic picture in this disease is usually that of a primary muscular atrophy, although a few observers, among them Sachs and Brooks, have found changes in the anterior horn. The muscles show atrophy and hypertrophy of the bundles. There is increase in the number of nuclei, proliferation of the perimysium, a deposit of fat cells in the muscles, and vacuolization of the muscle cells. Erb looks upon hypertrophy as a preliminary stage of the disease. He has found involvement of the heart muscle, too.

The disease is probably due to a congenital developmental disturbance. This is emphasized by the association with disturbance in the glands of internal secretion, by the presence of bony changes which in some instances antedate the muscular lesion, and the presence, in many cases, of mental deficiency.

The prognosis is good unless the muscles of respiration are involved. The disease may last from 30 to 40 years. Oppenheim has described a case where the patient was 58 years old at the time of his observation.

The disease must be differentiated from polymyositis, where, too, there is diminished response to the electric current. But in these cases there is usually pain and no pseudo-hypertrophy. Wasting of the muscles from tuberculosis or other cachetic conditions can easily be excluded. Arthritic processes in the spine may sometimes lead to difficulty in getting up from the supine position, but in such cases we find local tenderness over the spine, and pain. Poliomyelitis can be excluded by the history and the electrical changes in the muscles. Congenital muscle defects sometimes occur and may simulate dystrophy, but in such instances there is usually no progression. The disease is easily differentiated from the Charcot-Marie-Tooth type of muscular atrophy. This is a familial disease which begins in the muscles of the feet. There is wasting of the peroneus, the extensor communis digitorum and the small muscles of the feet. This rapidly leads to deformity of the feet (*pes equinovarus*). Later the legs and arms may be involved. Fibrillation may

be present and there is incomplete reaction of degeneration. At times there are sensory changes. The pathology of peroneal type of atrophy includes lesions besides those in the peripheral nerves, in the posterior columns, the anterior horn cells, and later on also of the lateral columns.

Finally myatonia congenita is very readily excluded, although recent observers have attempted to identify it with the Werdnig-Hoffman type of progressive muscular atrophy.¹

¹ Slauk: *Deutsche Zeitschrift für Nervenheilkunde*, Vol. 67, 1920, page 1.

EMOTIONAL EPISODES AMONG PSYCHOPATHIC DELINQUENT WOMEN*

BY EDITH R. SPAULDING, M.D.

It was largely because of the frequency of emotional episodes among the generally inflammable population at the Bedford Reformatory that Dr. Katherine B. Davis, who had previously been for a number of years the superintendent of the institution, felt the need of the equivalent of a psychopathic hospital where the unstable types could receive more individual study and treatment than was possible in the main group of the institution. As a result of Dr. Davis's efforts, a special building was erected for this purpose in 1916 as a part of the Laboratory of Social Hygiene, which had been established four years earlier for the psychological and sociological study of the reformatory cases. This hospital, or Frances Bement Cottage, as it was called, was equipped to care for twenty patients, a few of whom were some of the more stable girls from the reformatory who lived there in the capacity of workers. Such positions, it may be of interest to add, were considered desirable by the girls because of the trust implied and the responsibility entailed. The Cottage furnished many of the therapeutic and educational resources of a psychopathic hospital in an atmosphere that was, as nearly as possible, in such a group, the equivalent of a normal family life.

The purpose of this paper is to show the sources of emotion expressed in the outbursts that were common among the patients. Much knowledge of the emotional life may be obtained from such episodes, and they may be considered of value as indicators of the keynote of the individual's social maladjustment. In order to illustrate this, six delinquent women, who were subject to episodal attacks, are described in detail.

As a result of our observations it has seemed to us that the emotion displayed arose from three distinct sources, which may be described as follows:

I. First, it was due to the disappointment and chagrin that is natural to us all in every instance of thwarted desire. In the reactions of those who have habitually had their own way and who still

* Read before the Ward's Island Psychiatric Society, Feb. 16, 1921.

retain the impetuosity of childhood, this single source may account for much emotion.

II. In the second place, much emotion was freed because of the breaking down of or interference with some adaptive mechanism. In most of the cases studied there had been built up, as a result of failure in meeting certain social situations, a secondary adjustment that was often unconstructive or anti-social in nature. This was used to compensate for the patient's inability to adapt herself to situations that may have occurred years earlier, or her unwillingness to face some disagreeable reality.

The habit of stealing in one instance was a secondary mechanism through which the patient endeavored to obtain that which she had been denied by the circumstances of environment. In another patient, lying was such a mechanism, utilized to prevent the necessity of facing disagreeable truths in general or of admitting the existence of another mechanism, such as stealing, which in itself had represented an attempt to escape the unpleasant. The habit of running away, manifesting itself at first through truancy and running away from home and later in life through frequent change of position, was invariably a secondary mechanism constituting an attempt to escape relations that were disagreeable or, to the individual, even intolerable. The habit of screaming to gain an end, not uncommon in childhood, was another mechanism of our adult psychopaths that was employed at times in combination with assaultive behavior and constituted an attempt to accomplish what had been impossible by more mature methods. In two of the cases, homosexual relationships represented a substitute for unattainable heterosexual ones that had been preferred before admission to the institution and in this sense might be considered a mechanism resorted to temporarily because of the patient's limited environment.

All of these habits were simply substitutive attempts at expression of individual energy. They constituted props that oftentimes compensated for inefficiency. It was a terrible blow to the ego when the successful carrying out of an artificial mechanism was prevented through some resistance in the environment and the chagrin caused by its failure was a second source of the emotion generated. While it is possible for an emotional explosion to be the result merely of thwarted desire, still in the majority of our cases, a compensatory condition, such as we have described, was found to be interfered with.

III. In studying the third source of emotion, we found that, deeper than the artificial mechanism that had been formed, there

was another emotional level, namely, the more or less unconscious remembrance of the original failure of adjustment with which, doubtless, much feeling had at the time been associated. As a cause of this was found the patient's real inferiority, her greatest weakness, perhaps, and frequently the turning point at which her energy unconsciously sought a vicarious outlet that led to anti-social conduct or a delinquent career. Here, then, was the inferiority, inadequacy, immaturity, or emotional experience that had never been faced or satisfactorily dealt with in earlier years. It was as though at the time of each episode an exposed nerve had been touched. Although this reminder may not have been in the conscious mind of the patient, still it was, undoubtedly, the third source of emotion and accounted, to a great extent, for the intensity of the reactions; so that here was often revealed the key to the general maladjustment which offered access to those obscure regions where the deviation first occurred. In all such cases the discovery of this deviation should be the foundation of any process of reeducation.

This approach to the patient's emotional life is presented as a generalization or skeleton on which to build rather than as a substitute for a detailed analysis. In cases in which analysis is possible such a guide should be of use in unravelling the intricacies of the various complexes and resistances of the personality. In the six cases studied, however, detailed analysis was impracticable because of their intellectual limitations and the inaccessibility of their mental make-up.

In order to present a picture of the mental make-up of each patient that we may demonstrate in each instance what we believe to be the various sources of emotion, each of the following six cases has been described in detail as regards personality and the triviality of daily reactions. They all represent types that are significant in the manner of expression of their individual energies.

CASE I. Martha S., a good-natured, fun-loving colored girl of 18, in whom racial primitiveness was a predominating factor, was committed to the institution because she had refused treatment for gonorrhoea. She was the least abnormal of the six cases studied, and was in the hospital in the capacity of a worker rather than as a patient.

The physical examination was negative except for an inactive process in the right lung, a slight tremor of the hands, and a gonorrhoeal vulvovaginitis. The Wassermann was negative.

According to the Stanford Revision of the Binet Simon scale her mental age was 11 years and four months, giving an intelligence

quotient of .71. She made 76 points by the Yerkes Bridges scale which gave her a coefficient of mental ability of .88. Therefore she was graded intellectually as belonging to the inferior group of normals. The psychological examinations of the six patients were made at the Laboratory of Social Hygiene that was under the direction of Dr. Mabel Fernald to whom I am indebted for the results recorded here. I am also indebted to Miss Almena Dawley for the social history of each case.

Martha's parents were colored and born in the south. Her father was abusive, promiscuous sexually, a rover, and failed to support his family. Her mother, although unsuccessful, always made an effort to care for the children.

Martha was born in the south but when she was four years old her parents quarrelled, her father deserted the family, and she, with a younger brother, was brought north by her mother to a small town in New York. Because her mother was obliged to work and was even then unable to provide for herself and her two children, Martha and her brother were taken for a time by an aunt in New York City. When Martha was twelve years old, she returned to her mother, who, again, proved unable to care for her children, so that both she and her brother had to be placed in a home. The boy had a good record there, but Martha was said not to show "much strength of character," and she was represented as being "sly, easily influenced, but docile." Two years later when the mother remarried she again took the children to live with her and sent Martha to school until she was fifteen years old. However, she never went regularly and played truant much of the time because she preferred to be out of doors. It was at the end of the school term that her mother believed she began to lose control of Martha, because she was obliged to be away all day at work. After leaving school Martha went to work and held positions as "mother's helper," waitress, and chambermaid, earning from fourteen to twenty-eight dollars a month. Her employers generally found her "untrustworthy" or "lazy," or to have a "bad character." She loved fun and longed to return to the City where she could go to dances and meet people. The small town was too tame even with movies every night. As her father was living in the city with another woman and as Martha did not get on well with her step-father who seems to have possessed a quarrelsome disposition, she left home and went to the city to live with her father. While she was with him she stayed out at night to such an extent that he took her to court. Her mother appeared in court on her behalf and Martha was released to her care. Later on, however, Martha returned to her father. As he found that she was again going out at night and associating with undesirable people, he took her to court a second time. She was at that time committed to a Home from which place she was transferred to the City Hospital for the treatment of gonorrhoea. Martha refused treatment, because it was painful, and was consequently given a three years' indeterminate sentence at Bedford.

Martha was over-active in type but her superabundant energy was rarely expressed in constructive ways. She was an extremely

social person and very loquacious. She was popular with all the girls and particularly attractive to the white girls who had strong sex proclivities and few inhibitions. Although she had the egotism that may not be considered unnatural in a popular girl in adolescence, she was not dominated by it to as great an extent as were some of the six cases studied. In spite of the fact that in general she was responsive and cooperative and showed good power of concentration in any given test, still her effort in general was not sustained, probably on account of her lack of ambition for serious things. She was childish in her behavior, and always bubbling over with fun. She seldom dominated a group actively by her personality, although in a passive way she was a considerable power.

Her slow speech and soft voice, and her manner, which was frank and pleasant, enthusiastic and free from self-consciousness, made her very plausible in pleading her cause. She was inclined to minimize what she had done and to justify it by various excuses. If her wishes were not fulfilled she had moods of sullenness quite out of proportion to what might be expected in a girl of her years, although wholly natural in one considerably younger. In her bodily attitude, she expressed a great deal of abandon. This was particularly apparent in her dancing and it was noticeable that other girls showing similar abandon enjoyed dancing with her. It was in this abandon and her exaggerated fondness for play and her lack of interest in work that her racial characteristics manifested themselves. She did not give the impression of a girl who for a long time had led an irregular sex life. Although the traits of racial primitiveness and irresponsibility that were found in Martha were also found in other members of her family, still she appeared even to them an exaggerated type.

Martha used her popularity with the girls to gain articles of food and wearing apparel and she was said to have induced others to steal for her rather than risk the danger of being detected herself. Becoming accustomed to great demonstration of affection from the other girls, she began to require it in increasing amounts. When she did not receive as much attention as she thought was her due, she became sullen or extremely jealous of the individual who was receiving more. While her emotional episodes showed little violence unless she was actually attacked, at which times she would fight bravely, she gave way to outbursts of temper that usually could be accounted for by her unsatisfied desire for attention and by her jealousy. Her unwillingness to turn her mind from such things to her work frequently necessitated prodding if not reprimand.

The emotional episodes that were characteristic of this patient, appeared to result largely from thwarted desire, the most superficial of the three sources of emotion. The desire that was thwarted was a wish for popularity in general and a wish to play always and never work. The energy exhibited in one or two of the episodes was the result of a direct personal attack, which naturally enough aroused the instinct of self-preservation to satisfactory action, in such a primitive, and hence, uninhibited type of person. Her un-

willingness to suffer pain when first treated for gonorrhoea was in keeping with her unwillingness to face anything that was difficult. While her secondary mechanisms are not as marked as in the other cases, there was a distinct tendency to shirk responsibility, and to slip out of things disagreeable or arduous, in the easiest way possible. Her general plausibility aided by her soft voice and her efforts at self-justification helped her in this. The third source of emotion was the fundamental imbalance between work and play, and between primitive instincts and the inhibitions due to civilization. This had been the cause of most of her difficulties.

The original deviation was due to the imbalance already described plus constitutional instability and poor environment and training.

CASE II. Loretta C., an Italian girl of 21, whose parents were born in Sicily, was committed to the reformatory on a charge of vagrancy.

On physical examination Loretta showed some enlargement of the right and middle lobes of the thyroid. There was a fine tremor of the hands but no acceleration of pulse rate or von Graefe's sign. There were marked indentations along the edges of the upper teeth. The Wassermann of the blood was negative.

According to the Stanford Revision of the Binet Simon scale, Loretta graded 9 years and 11 months, which gave an intelligence quotient of .62. On the Yerkes Bridges scale she received 68 points which gave her a coefficient of mental ability of .76. She was decidedly defective in intellectual comprehension and had poor power of concentration. She was considered a border line case of feeble-mindedness.

Loretta's father, although 28 years in this country, spoke very little English. He was a shoemaker by trade, but during the past few years had earned only two or three dollars weekly. At one time he had a transient attack of blindness, and at fifty was senile and practically blind, which undoubtedly influenced his earning capacity. Her mother, who also spoke little English, had had rheumatism and fainted at times. The family was very poor and received city aid. Seven siblings, born before Loretta and her sister, died in infancy. The older sister was a very stable and trustworthy person and was happily married.

Loretta was born in Brooklyn where she attended school. As she herself said, she was not very smart and was promoted only every second year. She failed to reach a grade higher than 5B. Until the age of 9, when she was placed in a convent school, she was very troublesome. While in the convent she decided she wanted to become a nun, but this desire was short-lived and she finally had to be returned to her home because of her behavior. Describing the emotional episodes of her childhood she said "I used to holler if they accused me of anything I had done because I knew I was guilty," which very prettily demonstrates a mechanism of which she was conscious, namely a habit of "hollering" to replace taking blame and to discourage censure.

While Loretta was being confirmed at ten years of age, her dress caught fire and she received a very severe burn which involved her neck and chest; as a result she had extensive although not very disfiguring scars. Even as a young child she was always ungovernable and exceedingly vain, and she was particularly fond of movies. She told of taking her sister's clothes to wear to school, especially her silk stockings and other articles of finery. Her parents were strict and she said of them "They used to beat me for these things but after I was burned they could not do enough for me and they never beat me again."

At fifteen she voluntarily entered a religious home, but again had to be returned to her home because of her conduct. After leaving school she worked at eight different places as waitress. While at school she liked the lively children and when she was fifteen she began to go about with her friends to parks at night, although she maintained that she was a good girl then and did not know what danger she was in. Soon after this, however, she became promiscuous in her relations with men.

From the time she was seventeen she used to stay away from home several nights a week going to hotels with men. If her family objected to her going out she would "holler" and make a terrible scene. When she was nineteen she was arrested for waywardness and put on probation. She broke her probation and was given six months in a home. It was then discovered that she was pregnant. Her sister took her into her own home and arranged for her confinement and the subsequent care of the child without letting Loretta's parents know. Any inhibitions that Loretta may have had prior to the pregnancy, disappeared and after the birth of her child she lost her head completely where men and, particularly, where sailors were concerned.

She repaid her sister for all that was done for her by stealing her fur coat and her jewelry and running away to New York. Even this her sister forgave. She took the jewelry out of pawn and allowed Loretta to keep the fur coat as an inducement to keep away from her sailor friends. The temptation seemed even greater with the coat than without, for Loretta returned to her friends and remained with them until sent to us three months later.

Loretta had in her veins Sicilian blood. She stood out, however, from the rest of her family as being unstable emotionally and not up to her sister's standards intellectually. The results of her educational training were poor. In her work she showed little power of concentration, being absent-minded, variable and distractible. She was of the extravert type and overactive, inclined to be self-justifying, self-pitying and was easily offended. The physicians frequently received notes from her asking them if they were angry because they had not smiled at her as much as usual. In type she was a mixture of the childish and the primitive. In her work she was responsive and irregularly cooperative, showing a limitation of endurance and being easily discouraged. She was, however, frank and pleasant in manner, enthusiastic and demonstrative, but on several occa-

sions when some new project was being presented to the group she sulked by herself in the corner and not only refused to cooperate but persuaded others to laugh and talk instead of listening and helping. She was still rather vain in spite of the large scars on her neck and asked people repeatedly if they did not think her pretty. She was very sensitive about having her picture taken unless she had ample time to add all the frills. Her vanity did not seem to be a manifestation of pure love of self, as in the case of a patient, to be mentioned later, as much as a means of procuring the love of others, particularly of the opposite sex for which, in reformatory life, the abandon and virility of the colored girl offered the nearest substitute.

Loretta, however, was the type that responded well to encouragement and, furthermore, was very dependent on approbation for the impetus to accomplishment. If the flower that she put on one's tray in the morning was appreciated and remarked upon, she smiled for hours. She was despondent if the cake she had made was not eaten by everyone. On the other hand, if her table decorations were complimented she was delighted and each individual in the hospital had to be told about it.

This constant demand for affection was consistent with the passive type of her emotional makeup. She was said by the matrons and nurses to talk of sex matters continually and everything that was said in her hearing was given a sex meaning. Like Carrie, another of the six patients, she was openly dominated by her sex impulses. Although in her previous life she was said to have become very much excited, when she was not allowed to go out with her friends, with us she never showed cruelty, violence, nor even aggressiveness in the expression of her emotional impulses. She loved the dramatic moment when she could throw herself at the matron's feet, put her arms around her and ask forgiveness. Her humility and apparent joy in sacrifice offered a decided contrast to Carrie's more aggressive characteristics. She represented to us the masochistic type, differing in this respect from Carrie, who was markedly sadistic.

Loretta showed intense affection for Martha, whom we have already described. She was very sad for some days, and wailed and screamed, when Martha was removed from the cottage. Not long after, while the girls were at chapel, a popular colored girl was reprimanded for talking to the white girl of her affections. When asked to change her seat the colored girl became defiant and there ensued an unpleasant episode in the midst of the service, in which she had to be taken from the room for striking the matron who had spoken to her. The incident caused much excitement among the hospital girls and that evening a note came from Loretta in which she said, "This morning and about five months ago taught me a good lesson, as really, doctor, it hurts me to think that you know that I cared for Martha at one time. It was some queer whim that I do not understand. I am very happy to know that it has passed before it was too late. Please forget that I ever liked a colored girl as I really don't know what got into me."

Because she was not allowed to go to confession at the same time that Martha went, thereby being deprived of an opportunity to see and communicate with her, she was sullen and emotionally disturbed for a whole day; she refused to work and insisted on being transferred to another cottage. In spite of the letter she wrote she was in a state of excitement most of the time after she learned that all the girls were to be transferred to the main institution and wondered if it would be possible for her to be in a cottage from which she could see Martha and wave to her.

Loretta was helped over periods of irritation by rest and by continuous baths. There came a time, however, when even these failed to produce the desired effect and Loretta would pack up the things in her room and insist on leaving the hospital. A few hours or at most a single day in her room away from her companions, during which time she had a chance to rest and think things over, never failed to give her a fresh start and increase her power of concentration and self-control for some weeks. It was said that she could not bear to have anyone take her place as waitress and she therefore controlled the passing mood and after a characteristic scene in which she threw herself at the matron's feet and begged forgiveness in dramatic fashion, returned to take up the duties in performing which she took such pride. This demonstrated the jealousy in her disposition, which could be utilized to her advantage even as her sentiment was.

Loretta reacted in an exaggerated way to joy and sorrow but on the whole she was usually overactive and somewhat elated, speaking always in a loud nasal tone which could be heard at a distance. Her laugh was voluminous and boisterous and was usually the result of a suggestion of sex or frank allusion to it.

The majority of Loretta's emotional reactions resulted from the maladjustment of her emotional life. The episodes followed an interference with a particular friendship, instead of interference with a desire for popularity as in the previous case. Her thwarted desire was an obvious source of much of the emotion displayed. She was also much upset if she felt her efforts were not sufficiently appreciated.

One secondary mechanism was the habit of periods of sullenness or of excitability which she had used in her home to aid in getting her own way and which still persisted. Another secondary mechanism was represented by the homo-sexual attraction that took the place of the temporarily unprocurable one. She had, furthermore, many unmet situations behind her about which were associated emotional episodes. Her life had been a series of desires for personal things. She had never learned to do without the whim of the moment, no matter how harmful it might be for her or where it might lead her. She was only partly conscious of the nature of the strongest of these desires, the physical one, but it was undoubtedly about this instinct and its expression that most of Loretta's difficulties had centered.

Her original deviation was her inability, with her limited intelligence, to control her exaggerated emotional desire. She was undoubtedly handicapped in this by constitutional instability, which at this time may have expressed itself through overactivity of the thyroid. She had, also, handicaps of environment and training.

CASE III. Esther, a Jewish girl of 21, was committed to the reformatory for receiving stolen property. She was very unstable emotionally and in personality might be designated as a genius type that had gone astray, presenting the associated idiosyncracies of such a makeup but failing in the main accomplishment.

The physical examination was negative except for some tremor of eyelids, hands and tongue. She had had an attack of acute rheumatism at three years of age. On two occasions Esther is said to have had "death spells" which were so alarming that a doctor was summoned. The parents disagreed regarding these attacks. The mother thinks that she was unconscious and the father is sure that she was not. The doctor who was called said that she must have undergone a severe nervous strain. She had had her appendix removed some years previously following which she became very much excited, tearing off the dressing so that the wound was opened and had to be resutured. The adhesions that resulted from this operation were operated on while she was at our hospital, after a long period of whining and crying during which she refused to allow it to be done.

Intellectually, Esther was included in the low normal group. According to the Stanford Revision of the Binet Simon scale she had a mental age of 11 years and 5 months, which gave her an intelligence quotient of .71. She made 80 credits on the Yerkes Bridges point scale. Emotionally she was considered quite unstable. She had been examined and observed in most of the clinics and psychopathic wards in New York. Sometimes she had been considered feeble-minded and "subject to attacks of mental excitement," sometimes "mentally unbalanced" and sometimes largely the "product of her environment."

Her mother was a very unstable person and a voluble and erratic talker. She was, however, a good housekeeper and manager. All observers agreed she had never understood her daughter or known how to manage her rather difficult personality. The father who had not had much education was intelligent, egoistic and fairly well-to-do, making sixty dollars a week. There were two sisters; one was doing very well and the other was considered mentally deficient, having had an accident when young, which may or may not have been the cause of her trouble.

Esther had a good home and her father, who believed her to have musical genius, bought her a piano when she was six years old and gave her a musical education. She attended school from the age of six to fourteen, reaching grade 5A. She failed to be promoted twice. At home she was given everything she wanted and she herself admits she was spoiled. Later when she began to demand her own way in everything and became unmanageable, her

father had no influence over her, and her mother constantly watched, nagged and threatened her and even dressed in men's clothing to act as a detective.

Esther began to run away when she was nine or ten years old and at eighteen left home permanently, being at that time able to make from fifteen to eighteen dollars a week by playing the piano at moving picture shows. It was when she was eighteen that she was complained of in court by her mother and was sent to a Home on a charge of incorrigibility. Although she had been found in a house of ill repute, she was not thought to have been immoral at that time. At nineteen, however, she became pregnant, and the child was cared for by her mother.

For several years she had been going about with Italians. Shortly before coming to us, she, with a maid and two men, stole a ring from the home of a wealthy woman where the maid was employed. As the maid was not allowed to share the proceeds, she pressed the charge of larceny against our patient, who in consequence was sentenced to Bedford.

Esther was always superior to her environment and to the other girls. She was hypocritical of everything about her. In order to express fully her superiority, she was continually making trouble by listening to confidences from one girl and passing them on to another. As one of our matrons said, "She frequently passes on confidences which she has never heard," thereby stirring up jealousy, feelings of ill-will and resentment among the other girls. After making trouble she would begin to cry, pretending that she had been abused. She lied to the girls about others, at the same time making them all believe she was their best friend. When found out she would ask forgiveness and in that way obtained their sympathy and was then ready to start a further disturbance. One of the matrons said it was difficult to know which was harder to stand, Esther's periods of humility, obsequiousness and "holier than thou" attitude, or her aggressive and domineering moods.

Apparently Esther had considerable musical talent. She played successfully for moving picture shows and told us that she also composed music, but as her father said, "we sacrificed everything that you might be a genius and see what you have become." The genius goal was never attained but she had all the characteristic peculiarities of greatness!

Esther had little power of concentration and was very poor in judgment, showing poor learning ability and lacking definiteness of purpose. She was affected in manner and was always playing the part of the injured child. She suffered pain in her side for eighteen months rather than undergo her operation for appendicitis. She moaned and cried in an hysterical manner when suffering any pain, but would stop abruptly when scolded as one might scold a very naughty child. She refused to take most medicines, was very fastidious about her food and would not take milk except in certain forms.

Esther talked incessantly and accomplished almost no work. She would threaten to strike the girls and accuse one of telling an-

other not to sit near her. At one time she raised a chair above her head and threatened to kill Martha because of some slight that she thought she had received. She lied if reprimanded but when proof was produced admitted her guilt and swore dramatically she would be a changed girl in the future. She was much disturbed over the badness of girls who came for salvarsan. She happened to have contracted only gonorrhoea. Firmness in Esther's case with threat of deprivation of privileges and temporary removal from the social life of the hospital never failed to have a beneficial effect and to reduce her excessive egotism at least to a livable level.

Here was a person who was considered by herself as well as by her family to be a genius until an insufficient amount of this regal quality failed to justify such a diagnosis. The resulting Jehovah complex had to find another outlet and therefore she sought an atmosphere of superiority in everything she did and said. As we have already seen, this was expressed by her desire to dominate every situation however trivial and the domination was greatly assisted in its expression by melodramatic characteristics. Her emotional explosions not only resulted from the fact that she failed to dominate the situation of the moment, but they also received an added impetus from the unconscious realization that she had failed in the original purpose of her life. Because of her failure to attain greatness in being natural, she attempted to force this issue by assuming an affected manner. Her love for the dramatic that did not have a constructive outlet on the concert stage sought a vicarious outlet on the stage of life.

The thwarted desire was then the inability of the ego to express itself successfully in the occurrences of every day life with dramatic power. In trying to accomplish this, she had formed a secondary mechanism which corresponded to Adler's "masculine protest," and was an attempt to dominate every minor situation or to create situations in order that she might dominate and introduce into them the joy of melodramatic expression. This secondary mechanism included much affectation, whining, and quarrelsomeness. The fundamental failure or sensitive point touched was the original failure to attain that which had been expected of her by those who had sacrificed so much. This had resulted in innumerable maladjustments in her home life and much friction with her parents.

Her original deviation was her inability, perhaps because of her hysterical makeup, to take advantage of her early opportunities and apply herself more seriously to her music. Her adoring father and her nagging mother were handicaps. She early resorted to the mechanism of flight and threw over all responsibilities which she found irksome.

CASE IV. Bessie D., a girl with good mentality, probably Russian, was committed to the institution on a charge of larceny. Bessie's personality was somewhat paranoid in character, and expressed itself continually in anti-social ways. Her predominating characteristics were her extreme love of self, her corresponding suspicion of everyone else, and her resentment of authority in any form.

Physical examination showed a slightly enlarged thyroid and a severe double myopia. In spite of the fact that glasses were provided for her, it was impossible to get her to wear them except in the privacy of her room, because of her extreme vanity. An eye strain undoubtedly resulted, which increased her irritability.

She appeared unusually keen intellectually, although standard tests did not show her as high as she probably was, on account of the language factor. According to the Stanford Revision of the Binet Simon scale she had a mental age of 11 years and 8 months, which gave her an intelligence quotient of .74. In the Yerkes Bridges point scale she made 76 credits, which gave her a coefficient of mental ability of .86. During the examination she was reticent and untruthful, and maintained an attitude of animosity and superiority.

It was not possible to obtain anything reliable of this girl's family or of her life before the present commitment nor to trace her through the port of entry to the country.

Considering the unreliable history that we have of Bessie and and the lack of knowledge of her early life, it would seem almost useless to report the case if it were not that such a patient as this in her very negative features is representative of many that one comes across in the field of criminology. We did not know whether she was Russian, German or Austrian. When asked why she did not knit for the soldiers she replied "Why should I knit for the enemy," adding that she was born in German-Poland and that her father was probably serving in the German army. However, she gave a different story to everyone with whom she talked. According to one story she was born in Austria. When she was twelve years old she ran away with a musician. At another time she said she left home for some reason which she would not give, taking with her money that she had in the bank, and went to Germany where she stayed for two years working in a factory and at housework. In still another account, she lived in Paris as a prostitute, and in another she came directly from Germany to this country. She sometimes said that her mother died and that her father had remarried or that her father had died and her step-mother had remarried. Later she told us that both of her parents were living, but at one time said they were in Russia and still another that they were living in New York City. Even with fairly good detective work we were unable to learn anything about Bessie's family or her true history and she assured us that we never would.

One day when she was in a particularly communicative mood she told a little about her childhood, which from our knowledge of the girl, sounds wholly probable. One of Bessie's earliest memories was lying in her crib with people standing about her, evidently admiring her. She remembered that later on she was filled with anger because her older sister, who in her estimation was the prettier of the two, looked better in the same kind of dress that Bessie wore. Because of this intolerable thought she cut up her sister's dress. She remembered also lying awake all night, when she was twelve years old, enraged that her sister was more beautiful than she. As

time went on her mother apparently did not give as good clothes to Bessie as to the others because of her destructiveness. This only accentuated her jealousy. After this she began to destroy her own clothes because they were not as good as her sisters'.

When entering the reformatory she stated that she had come to this country twelve years earlier. Later when she felt that there was a chance of being deported, which she thought would be desirable as a method of escape from her sentence, she changed the date to two years previously and then said that she had described a friend who had come over twelve years earlier instead of herself. Her knowledge of English, although far from perfect, seemed better than she could have acquired in two years, even with her good mentality.

After coming to this country she was taken to a protective home by a society to which she had applied for work. She received a position from the Home at housework but as she stayed out too late at night, she was complained of and sent to another institution for observation. It was impossible for them even at that time to find out anything about her and while there she was very difficult to manage. When she was brought to the reformatory for a theft of twenty-five dollars there was in her possession a pawn ticket for a diamond ring, found to have been stolen from a previous employer. She was probably given the three years' indeterminate sentence because in court she gave no information whatever about herself. Her whole attitude was one of great defiance. When it was pointed out to her later that a policy of frankness would have been to her advantage and would have had more weight with the judge, she said "Well, under the circumstances it was wiser to say nothing."

Bessie represented the wandering type of individual. Her work records showed that she had seldom stayed longer than three weeks in a place. She was exceedingly anti-social in her attitude, trying to get as much as possible from her environment and to give as little. Her attitude toward this country was to get all she could from it and leave it again having given as little as possible, for she said "no one can be loyal to a foreign country." This general attitude she admitted had been characteristic of her entire life. Bessie said frankly that her way out of all difficulties was to run away from them, which was an adaptive mechanism that she had cultivated early in life.

While with us she made constant demands for special favors, usually for extra food or articles of clothing. She was moreover very destructive and tore up her underclothing and her dresses in moments of rage, usually because she thought she could in this way get better ones. When angry she frequently destroyed china, especially if it was necessary to serve her meals in her room, insisting afterwards that it was an accident. She cut up her blanket and pillow cases in order to make a skirt and underclothes in which she hoped to escape. This she actually succeeded in accomplishing but was brought back within twenty-four hours, having been found in a neighboring town.

Bessie was an unusually good-looking girl with regular features of perhaps a rather coarse type, good coloring and beautiful wavy golden hair which she spent much of her time combing and arranging. If a carpenter came to the hospital to work, she would immediately rush to her room to make herself more presentable, and if by any chance the door was locked so that she could not come out to see him she would bang on it so that the place became a bedlam. This exhibitionistic tendency was common to the majority of our group. Much of the time when she was in her room her hair was hanging down her back and in her irritable moods she was very loathe to confine it in any way. Once when asked to arrange it and make herself more presentable she said "I love myself just the same no matter how my hair looks."

Whatever characteristics, innate or acquired, had contributed to her development, she appeared when with us to be in the stage where love of admiration and personal adornment constituted the most prominent characteristic of her dominating egotism. She did indeed remind one of Narcissus as he gazed at his beautiful form in the stream. She frankly stated that she loved herself better than anyone else in the world, that she was her only friend, and that her entire interest was in loving and adorning herself.

Bessie said that her mother, recognizing the difficulty of the problem she presented, encouraged all the interests in which she showed any enthusiasm, even spending considerable money in order to accomplish this, but she lost interest in everything after a few weeks. Later she said that in thinking of her childhood she considered that her mother was much to blame for not having rules and discipline in the home. She admitted, however, that she was always different from the other children, that her mother never knew how to manage her and, although the other girls were brought up with household regulations, no rules were ever applied to her. She thought that she should have been made to go to school instead of being allowed to remain away; that she would have gone if her mother had insisted, and that she would have benefited by it. This was interesting as she openly defied the rules and regulations of the hospital, saying repeatedly, "I don't have to wear clothes I don't like, and I don't have to obey any of the rules of this institution if I don't feel like it." But again she said, "When I know that I must do a thing then I do it," and she said of the reformatory matrons "they understand us and know better than the nurses how to manage us."

In personality she was of the intravert type but overactive, anti-social and non-communicative about herself although she usually responded when not in a sullen mood and talked reasonably and intelligently on many topics. She was wholly self-centered and had seldom been known to do anything for others. In her manner she was usually on the defensive, rather self-conscious and probably shy, but in certain moods aggressive, irritable, combative, and sarcastic. After a period of punishment she was cooperative and tried hard to adapt herself, but her feeling of animosity toward other girls or officers was apt to overrule her good intentions.

She was unwilling to do what she considered menial work, except for a short period of time, saying that she was not going to spend her time in the kitchen, doing the same thing day after day. She refused to accept the position of cook because it involved responsibility. She was a good worker as long as she was interested, but she had difficulty in maintaining interest in her tasks for any length of time, perhaps because of the extreme tension under which she lived. Special work was provided for her in the occupational room, but her interest there too was short lived. She stole and lied incessantly and an examination of her room never failed to bring to light articles belonging to other girls or to the hospital. These were usually clothes of some kind. Her lies, however, were almost always for her own advantage as she saw it. She showed no tendency to fabricate without a purpose. When confronted with her own lies, her thefts, or her intrigues, she invariably denied them until she knew that there was proof of them and then she laughed. If punished she always insisted that she did not know what it was for, just as she insisted that she had committed no offense for which she should have been sent to an institution. It seemed at times as though she longed to be free from deception but she could never bring herself to face reality. If we could have confronted her with her relatives, she probably would have been relieved, but our detective work was not successful.

From a standpoint of management Bessie always remained an unsolved problem. No one was ever able to win her confidence. While she apparently craved a friend to whom she could tell everything, she could not overcome her feelings of suspicion and distrust. She hated one of the matrons because she reminded her of her own mother, whom she also hated. On one occasion she did seem fond of another girl, if we may judge from the affectionate letters that she wrote her. As her confinement progressed she showed an exaggeration of her suspicions against everyone. She was afraid that she might be sent to a hospital for the insane, realizing that she was losing in self-control, and was suspicious that everyone was talking about her, having perhaps her transfer in mind. She also thought that the girls were turning against her. Because she feared a transfer she disliked to have any leniency shown her as she thought it might be proof that she was abnormal.

Her anti-social grudge was of course an undesirable influence among the other girls who could not fail to be affected by it to a certain extent. If, however, they "hit the trail" and were no longer with her, she greatly resented their turning against her and threatened to kill them at the slightest provocation. If such a display of ill temper was ignored and she was allowed to do as she pleased she became still more suspicious and irritable, saying "you are letting me get by with murder because you think I am crazy. You are just getting ready to send me to Matteawan." Nothing suited her and the more one tried to fulfil her demands the more demands she made. She banged on her door at the slightest provocation, not giving one a chance to open it before she had lost her temper and made

a great disturbance. When asked why she did this she said it was the only way she could get things and she considered that it had very successful results! She was evidently convinced of the success of this adaptive mechanism. When her demands were impossible or the results were not successful there was a worse emotional outburst. The mechanism failed.

Her emotional reactions always expressed resentment of authority in some form which meant that her desire to rule was being interfered with. She once raised a chair and attempted to strike a matron for reporting her unruly behavior while on her way from chapel exercises. Later on, she became so angry in being thwarted in her desire to get food which had been smuggled in by another girl, that she struck an officer in the face, broke her glasses and barely escaped doing her permanent injury.

Bessie, since the age of twelve, had used the instinct of flight to escape from the intolerable situations that she had not been able to meet from the time she was five years old, among which were situations requiring adjustment to authority. As Bessie said, "When I was outside I wasn't nervous. When the time came that I couldn't stand people any longer, I just left and went among absolute strangers who knew nothing about my past." Bessie's emotional episodes were largely the result of not being able to carry out her self-constructed plan of compensation in her life, that of flight. For the first time she was thwarted in her desire to run away from an intolerable situation. This resulted in such emotional tension that any additional irritation was magnified, and if she was prevented from obtaining extra clothes or food, emotional outbursts resulted which increased in violence as time went on and the tension from the strain of confinement increased. The secondary mechanism, therefore, in this case, that was interfered with was the resource of flight which she had not been able to resort to for the past year, and its corollary of resentment against the resulting authority. Besides these secondary mechanisms there was also that of extreme self-love to which she had recourse as a permanent compensating outlet for affection because of her inability for some reason of projecting her interest beyond the inner circle of self. The habit of lying and stealing constituted other artificial mechanisms. She also resorted to anger and assault as compensations for being thwarted in her desires.

The third source of emotion was the series of episodes in the past in which she had been unwilling to accept a second place of any kind. These began in her earliest childhood with jealousy of her sister and hatred of her mother.¹ All of her artificial mechanisms when interfered with reminded her unconsciously of the maladjustments and emotional episodes in her past which were doubtless the result of her inferior adaptability.

Her original deviation was apparently the result of a psychopathic condition that interfered with the sublimation of her ego and her adjustment of the instinct of acquisition.

¹ Her attitude toward her mother in childhood was undoubtedly related to her conflict with authority in later years. No further analysis, however, of the family situation was obtained.

CASE V. Ellen B. was an attractive American girl of 18, who was sent to the reformatory on a charge of petit larceny (shop-lifting). Ellen was perhaps the most unstable of the six cases and was markedly of the untrained child type. She would even resort to violence and assaultive conduct to satisfy the whim of the moment.

On physical examination the patient showed no abnormalities with the exception of a palpable thyroid, slight acne and a sallow complexion. She was subject to attacks of migraine especially at the menstrual period, at which time she was exceedingly irritable.² The Wassermann reaction was negative.

The mental examination showed her to be 12 years and 11 months by the Stanford revision of the Binet Simon scale and to have an intelligent quotient of .81. By the Yerkes Bridges point scale she made 86 points which gave a coefficient of mental ability of .98, classing her in the dull normal group.

Her father was alcoholic, never worked regularly, and was quite promiscuous sexually. Her mother, who left her husband to live with another man, was found asphyxiated by gas in a hotel room where she had been staying with him. It is also said that she was pregnant before marriage. There were ten pregnancies after marriage, including three miscarriages. Two only of the seven children are now living, three having died in infancy, and two from accidents.

From the time her mother died, when Ellen was seven, she lived with her father's mother and sisters until she was twelve and she led a most unhappy life. During this period it was said she was required to pick coal from the tracks and was taught to steal ice. Her mother's brother found her at six o'clock in the morning in the yard stealing ice from the cars and sent her home, telling her grandmother that he would get what they were not able to afford. When her father learned what had happened he beat her.

After her grandmother's death she went to live with her mother's brother and his family. Here also she received poor care as her aunt was alcoholic and there was continual quarreling and rough talk in the household. When fourteen she went to live with another aunt where she apparently had a better home. At sixteen she began to steal things from department stores. One aunt thought that even though this was known by the relatives with whom she was living, little was said about it and it was allowed to become a habit.

Ellen said that the first time she stole was when she had been sent by her grandmother to get meat from the market for a Sunday dinner. She went with a friend who took a doll from a counter where hundreds were being displayed at a Christmas sale. After this Ellen stole some ribbons and then began to take larger things.

She attended school from her seventh to her twelfth year, reaching grade 7A. After she left school she was a packer in a biscuit factory and received six dollars a week. She refused, however, to obey orders and was discharged. A month later she worked there again, remaining six weeks; returning a third time she worked for

² The glandular imbalance evidenced by these symptoms as well as some others was undoubtedly of importance in causing her emotional instability.

three weeks but was again discharged as her work was unsatisfactory in every respect. She later worked in a munition factory where her work was considered satisfactory.

In February, 1916, she was arrested for petit larceny and given probation. A month later she was again arrested under another name and was sent to a Home for six months, where she was considered a dangerous character requiring close supervision. While there she was depressed and threatened to jump out of the window. This was apparently the result of being considered sexually immoral by the other girls. She was sent to a psychopathic hospital for observation, but no evidence of mental disease was found. Since the authorities at the home considered her too dangerous an individual for them to care for, she was subsequently committed to the reformatory.

This patient was of the overactive type, and markedly an extravert. She was exceedingly sensitive and her compensating mechanism for this was bravado and insolence. She felt superior to her environment, particularly since she had had no sex delinquencies. She was pleasant in her manner and cooperative if her interest could be won. She was, however, changeable and if she considered herself guilty in any way she was on the defensive and consequently defiant and sullen. She had apparently had little training in anything that was constructive. She said she was always humored by her aunts who brought her up, and although the other children in the family were made to meet situations and were held responsible for the keeping of certain rules, she was allowed to have her own way, possibly on account of the frequently changing homes and partly because of her emotional instability.

Her idea of stealing and lying corresponded to the childish conception of such things. Everything to her was a huge joke and she felt that if she could cheat in a game in order to win a prize it was all part of the game, and nothing would make her admit that she had cheated although everyone in the room might have seen her do it. She repeated again and again emphatically that she had never lied, that no one had ever caught her in a lie, in spite of the fact that her lies were almost incessant and frequently proved. She was very resourceful in explaining those in which she was actually discovered. She gave one the impression of being frank superficially, extremely suggestible and amenable to persuasion. However, deception with her had become second nature and she felt apparently that the things that she gained by it in the way of extra food or additional clothes were of far greater value than the alternative of being honest and doing without such things.

Ellen's childishness might have been taken for granted had she been but seven or eight years old, but it was difficult to deal with at eighteen. She felt that the whim of the moment must be satisfied whatever it was. Sometimes it was praise for what she had done that she wanted, sometimes an expression of friendship from one of her friends, sometimes she wished a new dress, or a tooth brush, or a comb, or an egg with which to shampoo her hair. She

could not be made to realize or admit that taking things constituted stealing and vehemently denied having done anything dishonorable no matter how great the proof was. It seemed impossible to get behind these unconstructive defense reactions and artificial mechanisms. Ellen had never developed a sense of "mine and thine," and her unwillingness to recognize its need seemed to result from a preference to remain in the security of the irresponsibility of childhood. However, she was a great contrast to the previous case and previous case displayed and she showed the suggestibility and good-although she not infrequently attacked another girl of whom she might be jealous, she did not have the anti-social attitude which the heartedness of a child. Her aunt said of her that she was kind-hearted but cold-blooded. She was religious and wished to become a Magdalene, which, considering the repression of her sexual life, is illuminating. She dreamed that God made her steal so that she would have to go to an institution and become a Magdalene, which suggested a possible way of expressing in her mind, the desire which she was evidently repressing. In this case as in the last there was apparently some repression of the deeper emotions, but Ellen was much better able to express her affection for others than was Bessie. Her episodes were more the result of an accentuated egotism that expressed its power in childish ways than it was an essential love of self. Ellen was an immature child in spite of her violence, while Bessie was a shrewd although Bolshevistic woman of the world.

After Ellen's entrance to the hospital one storm after another occurred. She began to quarrel wherever she went. There was hardly an hour of the day in which she was not in trouble because her feelings were hurt. Everyone else was to blame for "picking on her." She would not stand such treatment. The most trivial occurrences would upset her, and screaming and swearing, she would rush to her room. Not having been able to make the proper adjustment and use up her energy in the ordinary channels she would compensate for it by singing loudly in her room, greatly disturbing the rest of the hospital, quite in accordance with Adler's³ simplest forms of "masculine protest." As it was felt that it might be impossible for her to make any adjustment in the occupational room, she was allowed to work in the kitchen, but after a few hours this displeased her and she refused to do anything further there. Trying still another resource we allowed her to do outside work but this plan also failed and she then refused to do anything whatever.

During her residence in the hospital Ellen gained greatly in self-control, although frequent episodes always occurred that resulted from her emotional instability. The cause of her emotional upsets was usually her injured feelings or her absolute unwillingness to comply with any rules which invariably were contrary to her own desires.

All of her actions, however, represented the difficulties which would be expected from the childishness of a girl between five and

³ Adler, Alfred, *The Neurotic Constitution*, New York: Moffat, Yard & C., 1917.

ten years of age and there was none of the aggressive or of the passive expression of eroticism that was suggested in the other types.

In the case of Ellen there was strongly developed the secondary mechanism of lying to cover up her stealing and cheating, which were in themselves an attempted compensation. She therefore showed emotion that lasted for hours if not for days when her word was doubted, in spite of the fact that there may have been definite proof presented to her that there were many witnesses to the deception which she so vehemently denied. She not only resented being classed as dishonest in the eyes of those whose good opinion she desired and was irate that her artificial mechanism was not working, but she was also unconsciously reminded of a series of similar occasions in the past when she was unable to resist the temptation to have whatever she wished in her environment, which had been associated with dire consequences.

To summarize then, her desires were continually being thwarted because she was always demanding the impossible. Her more obvious secondary mechanisms were stealing, lying and crying. Her fundamental complex was her unwillingness to grow up and assume responsibility. At the same time, perhaps, there may have been an unconscious conflict between her suppressed and unsatisfied desire for adult experience and emotional outlet and her unwillingness to assume the associated responsibility.

Her original deviation was probably the result of a psychopathic inheritance plus poor environment and poor training.

CASE VI. Carrie M., a mental defective, 26 years of age, with marked erotic tendencies, was committed to the reformatory on a charge of prostitution. According to reports both Carrie's parents died of tuberculosis, her mother, the one parent whom she remembered, dying when the patient was six years of age. Carrie was thought to be an illegitimate child.

Her general physical condition was fair and she showed no marked anomalies. There was some enlargement of the inguinal glands and evidences of acquired syphilis. The Wassermann of the blood was positive.

According to the Stanford Revision of the Binet Simon scale her mental age was 10 years and 5 months, giving an intelligence quotient of .65; by the Yerkes Bridges scale she made 76 points which gave a coefficient of mental ability of .86. She was considered a high grade moron.

Carrie showed such poor judgment in everything she did, that everyone who came in contact with her believed her to be a feeble minded person of very low grade. Psychological examination, however, showed her to be of so high a grade of moron, that it was even questionable whether or not one was justified, from a standpoint of intellectuality alone, in committing her to a school for feeble minded.

Carrie was brought up by her grandparents and admitted that she was much spoiled by them. She attended school for four or five years, but when she left at the age of twelve, she had reached only grade 3B. After leaving school she worked in a factory where her

aunt was forewoman. While working there she made but three and a half dollars a week and she complains that her aunt scolded her too much. She was discharged, however, on account of inefficient work. About that time she got into bad company and was sent by her grandmother to a Home where she lived for three years. She was later returned to her grandmother and worked for three weeks. She then deliberately left home, took a furnished room, and went on the street as a prostitute, making from fifteen to twenty dollars a week. Later she went to live with a "pimp," whom she supported.

She was twenty years old when she was committed to the reformatory on a charge of prostitution. She remained from August, 1912, to June, 1915. She was returned in April, 1916, on account of broken parole and escaped from the institution in May of the same year. In October of that year she was returned on the charge of violating the tenement house law. She first had to finish her earlier sentence and only began to serve the new one in November, 1916.

While in the reformatory the first time, she became greatly infatuated with a colored girl, with whom she associated after leaving the institution. She then lived for ten months with a man whom she had "picked up," and, later, married him. Although he was very jealous of her friendship for the colored girl, he was not averse to her going on the streets to earn money for him when he was ill. When he died, during Carrie's second sojourn at the institution, she was told the sad news in the chapel. She said afterward that she would have fainted had her stocking not been full of notes.

While in the institution Carrie caused infinite trouble, and was continually forming the most intense kind of friendship with any colored girl with whom she came in contact. She would break up the furniture in her room or the glass in her window because the colored girl whom she loved had been punished, or, in an attempt to be sent to the same disciplinary building, she would deliberately "break out" simultaneously with the other girl. Because of the fact that she was thus continually in difficulties in the institution, she was brought to our hospital. She had not been in the hospital twenty-four hours before she proceeded to form an intense friendship with the only colored girl in the house, whom she professed to love even more than she had her husband. In the classroom, she would sit with her whole attention concentrated on the colored girl with an expression of fascination, forgetting everything else. When spoken to she would lose her temper or begin to cry.

It seemed impossible for this girl to maintain her equilibrium as long as there was any sex temptation in her environment. She was continually talking and thinking about such things, and frequently expressed herself in a rather cruel and aggressive way. Experienced as many of the women in the hospital were in heterosexual relationships, they were horrified at Carrie's talk of homosexual things. Many of the girls feared her and said openly that they would dislike to be alone with her. Some would not even allow her to touch them.

Carrie's dreams showed the same craving for sex gratification in the cruel ways which her actions suggested. On one occasion she

dreamed she was with a man and another woman and that the man stabbed the woman in the neck with a dagger. She remarked that the strange part of it was that no blood came. At another time she dreamed she took one of the girls who was in the hospital and threw her out of a fourth story window.

The most striking characteristic of Carrie's personality was her aggressive eroticism. Although while in the institution she appeared to be of the homosexual type, still her history as a prostitute outside was so definite and so persistent, that her homosexual reactions appear to represent but a temporary substitute for the heterosexual relationships that she preferred.

Carrie was of the overactive, loquacious, and oversocial type, very egotistic and egocentric. She was very impulsive and demonstrative as well as overwhelmingly sentimental. She was oversensitive and easily offended and wished to start warfare at once with the many persons who hurt her feelings during each twenty-four hours. She was suggestible for the undesirable but stubborn when good council was given her. She was self-justifying and usually self-pitying. She was excitable and so variable and undependable that it was never possible to estimate what she would do the next moment, and she was capable of the most aggressive behavior imaginable. After an explosion, however, she always justified her conduct and seldom showed the humility that followed Loretta's explosions. Her aesthetic appreciation is best expressed by the fact that she converted her room into a boudoir by the use of cerise tissue paper of a lurid hue, which after it had been enjoyed sufficiently in this rôle, was utilized for weeks to come as rouge.

The basis of this patient's worst emotional explosions was her homosexuality. First came the thwarted desire, for Carrie in her aggressiveness and notwithstanding her intellectual limitations, was anxious to rule her environment in a forceful way, and any interference with her plans produced a storm.

In the second place was her habit of gaining an end through aggressive behavior of the most violent type, breaking windows, smashing up furniture, and even through personal assaults.

Farther back still was to be found her inability to adjust to authority or discipline of any kind, something it had been impossible to teach her at home, and for which she had been sent away to school. It was because of this first inability to make a proper adjustment to authority, as well as because of her aggressive tendencies and her emotional instability that the habit of assaultive behavior, her compensatory mechanism, had developed.

The aggression of this case presents an interesting contrast to the submission seen in the case of Loretta, the Italian girl, both of whom became so infatuated with negroes.

Her original deviation was the result of imbalance between her sex life and her limited mentality on a basis of much emotional instability. There was also an inadequate environment and insufficient training. Not only were there primitive desires expressed here but traits which made even our women shudder.

The six girls who have been described formed themselves into two groups of three each. Each girl remained loyal to her own group and did all she could to annoy the others. The factors that had been significant in causing the individual emotional episodes were also the basis of the group disturbances.

One group was composed of Martha the colored girl, Loretta the Italian girl, and Esther the thwarted genius. The other group was made up of Carrie the emotional moron, Ellen the untrained child, and Bessie the anti-social beauty.

The difficulty started when Carrie, in trying to press her suit with Martha, related to the entire hospital a dream of the most intimate nature in which they both figured. Even though Martha loved popularity, she could not stand this public scandal that Carrie was creating. At the same time Loretta was paying her marked attention in a much quieter way which she infinitely preferred. She, therefore, took delight in spurning Carrie's affection and joined with Loretta, adding also to her side Esther, who with her usual trouble-making propensities, had already started trouble with Ellen and Carrie, and was glad to have the protection of the other two.

Carrie, being spurned by the other three, was glad to join with Ellen, who occupied a room on the same corridor. Ellen had already joined with Bessie, who occupied the adjoining room, and to whose anti-social leadership she was easily a prey.

The tension became so great between the two groups that it finally was necessary in order to prevent the emotional situation from reaching a crisis, to remove Martha, who, as the bone of contention, represented the key to the situation.

It was interesting to note, however, in the concerted emotional reactions that each girl acted according to her stated type. For instance, Bessie was always glad of a chance to join with anyone who would sympathize with her resentment of authority. Ellen, who also resented restrictions of any kind, welcomed the opportunity to join with her. They had in common, also, the compensating mechanisms of lying and of stealing, the latter representing a primitive expression of the instinct of acquisition. Carrie, having been rebuffed in other quarters, and because of her limitations of intellect, was glad to be taken up by such forceful individuals. All of these three were capable of violence in the aggressive expression of their emotional energies, in this way satisfying their instinct of pugnacity. All three of these patients attempted to escape the situation by running away from the institution, showing a common recourse to the instinct of flight. All three showed much self assertion, or a

positive form of self-feeling. Carrie and Ellen were distinctly gregarious, differing in this respect however from Bessie who showed the tendency on this one occasion only.

In the other group Loretta and Martha formed a natural alliance, and Esther was glad to get into the fray on the opposite side from Carrie because of trouble resulting from some remark that she had overheard Carrie make. All three enjoyed self-abasement or a negative phase of self-feeling in their common joy in submission when occasionally they recognized authority. Martha evidenced the instinct of repulsion at Carrie's crudeness and her resulting disgust sent her to the less aggressive Loretta. All of this second group were distinctly gregarious, although Esther had difficulty in expressing this instinct on account of her general unpopularity, resulting from her trouble-making propensities and her attitude of superiority. Perhaps the most striking thing about the six individualities was the apparent absence in their make-up of the maternal instinct and of anything that might belong to the instinct of construction.

The crisis that was averted by the removal of Martha produced a lull in the emotional tension of the hospital which a few weeks later was again increased by the admission of another colored girl as a patient. A similar situation again threatened, which necessitated the removal of the second colored girl, who had come for a spinal puncture and a short period of observation. Before the transfer could be effected, however, Carrie's affections had become so involved that she swore by all that was holy to smash out were she also not transferred at the same time.

Dramatic scenes occurred, the smash out was averted, but it became necessary to special Carrie away from the main group for a protracted period.

SUMMARY

The types represented by the six patients might be designated in Freudian terminology briefly as archaic, masochistic, narcissistic, infantile and sadistic, and having attributes of Jehovah. There was obviously much exhibitionism among the group as a whole both expressed crudely and in symbolic ways. Viewed from an Adlerian standpoint, all the reactions of the six patients might be interpreted as masculine protests which represented efforts of the girls to reach their guiding fiction or poorly selected goal. From still another standpoint, that of McDougall, the explosions may be said to represent emotions freed in the expression of fundamental instincts, such as flight, repulsion, pugnacity, self-abasement, self-assertion, gre-

grievousness and acquisition. Again, when we remember that Emerson said the thing above all others to be attained in life was power, their behavior may easily be described as attempts to express power in the different ways that their various individualities indicated.

All these points of view are an aid in the interpretation of such episodes and help us to see more clearly the intricacies of the three following sources of emotion.

First: that of thwarted desire as shown in not being able to run away from situations, in not receiving as much affection or admiration as was wished or being able to express affection for another as violently as was desired; in not getting extra food and clothing and personal adornments if these were visible in their environment and, briefly, in not being able always to have their own way and to dominate every person with whom they came in contact and each situation that arose.

Second: the interference with some secondary or adaptive mechanism such as screaming, fighting, lying, stealing or running away.

Third: the disclosure, or at least the unconscious tapping, of initial inferiorities, inadequacies, complexes or failures in development, such as unwillingness or inability to grow up, leave childish self-centeredness and assume adult responsibilities, detach interest from individual egotism and project it beyond that narrow circle, make necessary adaptations and perhaps accept a place as one in a group without necessarily being its leader.

While emotional episodes such as we have described are not to be encouraged on account of the harm they do to the equilibrium of the patient, still when they do occur they should be utilized in ascertaining the unadjusted factors in the patient's personality and the reason for the misdirected and unconstructive expression of her energy.

Society Proceedings

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MONTHLY MEETING, APRIL 21, 1921

JAMES B. AYER, M.D., in the Chair

IS THE TREATMENT OF PATIENTS WITH GENERAL PARALYSIS WORTH WHILE?

DR. HARRY C. SOLOMON

DR. SOLOMON said the question of whether it is worth while to treat cases of general paralysis is one that comes up often and about which there is a great difference of opinion. Pathologically it is a condition of degeneration of the parenchyma of the central nervous system. It is very difficult to distinguish even pathologically between cerebro-spinal syphilis and true general paralysis. There can be no doubt that some cases that are apparently cerebro-spinal syphilis prove to be general paralysis or vice versa. In making a diagnosis of general paralysis there must be a more or less insidious deterioration of the personality of the individual in whom are found certain neurological symptoms, speech defect and facial tremor being of the most important. In addition, there should be certain laboratory findings which should include a Wassermann which is positive with 0.2 c.c. of spinal fluid, a paretic gold curve, globulin, excess albumin and a pleocytosis somewhere near 100. Practically all of the patients which were shown met these requirements. These patients had been submitted to treatment consisting largely of the intensive use of arsphenamine 0.6 of a gm. twice a week over a period of three or four months.

Nine patients were exhibited as examples of prolonged remissions under treatment. The limited time prevented showing many more cases equally or more striking in the completeness and duration of their remissions.

The first case exhibited went to Westboro State Hospital in 1916. She remained there about six months and was diagnosed dementia paralytica. She was then sent to Grafton State Hospital, where treatment was begun. She left the hospital after two months of treatment apparently having recovered clinically. Her spinal fluid was practically negative when examined in 1919. It is now positive, but she has been clinically well for a period of five years.

The second case was a man of 53, one of the oldest in the series

in time of treatment, but not in years. He was committed as a case of general paresis in 1915. He received a great many treatments over the first four months with spinal fluid drainage, being one of the few patients who was drained thoroughly. When last examined, January, 1921, he had a negative Wassermann, cell count 7 and gold 0001100000. He is now making twice the salary he made when he came to the hospital.

The third case did not do well under intravenous injections. He came in April, 1916, aged 37. After two months' treatment with arsphenamine and mercury he was no better, and he was then given three intraventricular injections, followed by seven intravenous injections of arsphenamine. On November 16 the spinal fluid was negative.

The fourth case was sent to the hospital by his employer because he had become inefficient in his work. On March 14, 1919, he had had a shock and felt dizzy when he got out of bed. His memory had been poor since then and he had a speech defect and a writing disorder. He has had both intravenous and intraspinal injections, and although his spinal fluid is not quite negative, yet he is back at work and his employer says he is as efficient as he was in his best days.

Six other cases were shown which demonstrated like results. All these cases were diagnosed as general paralysis by the standards that are used today and committed to the State Hospital as such. It is believed that if these patients had not been treated they would have died or still be at institutions instead of living for a period of from two to six years in good health and with good efficiency and ability.

DISCUSSION

DR. ARTHUR H. RUGGLES spoke very highly of Dr. Solomon's work in the treatment of cases of general paresis and said that the restoring to some degree of economic efficiency of even one case out of every ten treated, more than justified the continuance of the work.

Regarding the method of cistern puncture, this treatment has been used about fifty times at Butler Hospital with no bad results and with the most satisfactory coöperation on the part of the patients. The patients seem to have less reaction following this treatment than after the intraspinal method and it presents a new point of attack in the case of patients that do not respond either to intravenous treatment plus spinal drainage or the combined intravenous and intraspinal treatment.

DR. H. C. SOLOMON, in answer to Dr. Ruggles's question, said that he could not give the exact figures for the number of remissions in the cases treated. Some were only treated a short time because it was impossible to get coöperation. In 1916, of all the cases treated in the State hospitals 25 per cent. were allowed to go out on remissions. Age does not seem to play an important part. Some cases treated at 65 years have done very well. It is impossible to give a

dogmatic answer as to why certain cases should do well and others badly. A young man with a good heart and kidneys may do poorly possibly because he has received an overwhelming infection that has used up his immunity.

Emphasizing Dr. Ruggles's statement regarding Dr. Ayer's method of cistern puncture, he remarked on its being a very practical addition to the treatment of these cases. In light of what can be accomplished with this method a great deal that has been written on prognosis will have to be rewritten, not on its use alone, but in combination with the intravenous and intraspinal method. It is revolutionary in the treatment of brain and cord inflammatory conditions.

Dr. Solomon also advocated intravenous injections if intensively continued and considered one of his chief mistakes over-conservatism in giving doses of no more than .6, .8 and 1.0 gms. to a patient. The worst that could happen by too large a dose would be to shorten the life of a patient with only a few months to live, and it has never been shown that larger doses do damage or approach the tolerance of the patient.

ENCEPHALITIS WITH SYMPTOMS INDICATING DISTURBANCE IN THE REGION OF THE PITUITARY

DR. DOUGLAS A. THOM

DR. THOM presented a case giving the following history: The patient, a young girl, was born in 1902 and had never been sick in her life until February, 1920. The family history was negative. She graduated from high school two months previous to the onset of her illness at the head of her class and took a position as stenographer at \$17 a week. She liked her work and was getting on well and up to the time of her illness there was nothing in her social, economic or medical history of importance. The girl was normal in every way, was not hypersensitive and had no character twists to disturb the tenor of her life. On February 4, 1920, she dreamed of an automobile accident in which her brother was hurt and she was killed. All the following day her mind was filled with the content of this dream. She was crossing the street lost in thought when a policeman came up and scolded her for almost stepping in front of an automobile. She began to weep and interpreted this as meaning that her brother must be killed. She went home anxious and worried to find that her brother was all right. From that time on she was restless and was unable to sleep for about a week. Then she slept continuously for four or five weeks. At the beginning of this drowsiness she had diplopia and strabismus. The drowsiness has persisted. She has been emotionally unstable since that time. This constituted briefly the history given by the patient's mother when the patient was brought to the hospital. At the present time she is well developed, highly coöperative, talks rapidly, without much expression, appears very intelligent. By psychological test her mental age was above her chronological age. Memory and judgment intact.

No motor disturbance. Has perfect insight into her condition. Physically is strong and well, has a face of mask-like expression, otherwise normal. The pupils are dilated, mouth, teeth, tonsils negative. In fact, the entire physical examination is negative except that the hands are held in the Parkinsonian attitude. Her shoulders droop slightly forward and she is conscious of a tendency to fall forward. Her Wassermann reaction is negative as are other examinations. The symptom on which the mother laid great stress was the extreme thirst of the patient. While at home she drank about ten quarts of water daily and excreted through the kidneys about the same amount and this has persisted for about a year. The mother and girl date this polyuria and polydipsia from a few weeks after the onset of the lethargic condition.

The problem presented is whether or not some part of the pituitary or neighboring region has been involved accounting for these symptoms of diabetes insipidus.

ENCEPHALITIS WITH PROMINENCE OF HALLUCINATORY SYMPTOMS

DR. L. J. THOMPSON

DR. THOMPSON reported two cases of encephalitis of the psychotic type which developed hallucinations unaccompanied by delirium. The presence of hallucinations in encephalitis has been commented upon before, but in almost every case the hallucinosis has been credited to the delirium. In these two cases, however, there has been an absolutely clear consciousness with no delirium whatever. Of the eighteen cases of definite encephaliti^s with hallucinations which have been treated at the Psychopathic Hospital, all were accompanied by delirium except these two reported cases and one other. In the literature almost all the cases reported with hallucinations have had delirium at the same time. The first case was a woman 37 years old, married, who came to the hospital one year ago. Her symptoms dated back six months before that to November, 1919. At that time she began to have dizzy spells and once actually fell over. Shortly after that she began having severe headaches at the back of her head, which would go away in a few hours. In January, 1920, she began to have involuntary movements of her legs, arms and head which shook continuously. She could not hold anything and could not dress and feed herself because of these tremors. One month before entering the hospital her psychotic symptoms began. She became very suspicious and said that the people upstairs were taking moving pictures of her which were to be in the Saturday Evening Post; then they were boring holes in the ceilings and pouring skunk oil through the holes. Men were coming through the window. Several times she thought she saw her husband, who had been killed in France. There were soldiers around her bed. At one time a sword came up beside her bed and disappeared. These symptoms continued until she entered the hos-

pital and here she continued to show hallucinations in all spheres. She had curious cutaneous sensations, heard voices, saw imaginary people, smelt gases and ether and tasted poison in her food.

The neurological examination showed a ptosis of both eyelids, irregular pupils and a dancing movement of the eyeballs. There was no definite disturbance of reflexes, but a general hypertonus of the muscles. The spinal fluid showed an increase in the globulin, 27 cells, a gold sol of 2334321000, with negative Wassermann. The hallucinations continued for about a week or ten days and then suddenly disappeared and she had very good insight. At that time her Parkinson syndrome began to present itself more and more. She had slight tremor of the hands and a mask-like face and her difficulty in swallowing increased. She went home and has been reporting to the Out-patient Department regularly since, but still shows residual symptoms. The diagnosis is undoubtedly encephalitis lethargica.

In the next case, however, there may be some doubt as to the diagnosis. This case showed no symptoms until last July, when a friend recommended that she go to a doctor for her nervousness. The patient noticed nothing except that her head was shaking. About three weeks later she said that certain people began to talk about her. Later on she began to have definite hallucinations and finally she was sent to the hospital. She had had headaches for a long time. The spinal fluid showed increase in globulin, 7 cells and negative Wassermann. A recent lumbar puncture is negative. After being in the hospital a little while she developed ptosis in the left lid. There was an inequality of the knee jerks. Patient has continued to have definite auditory hallucinations to which she occasionally reacts by outbreaks of temper.

DISCUSSION

DR. JAMES B. AYER asked if there have been autopsies made at the Psychopathic Hospital of the hallucinosis cases and if they showed cortical changes as are said to be present by Drs. Hassin, Bailey and others; also was the maximum amount of inflammatory process present, as in an ordinary case, in the mid-brain.

DR. PERCIVAL BAILEY, in discussing Dr. Thom's case, said that during the past year in collaboration with Dr. Fritz Bremer he had been occupied with a series of experiments on dogs which show that the polyuria which often accompanies operations on and diseases of the pituitary is due to a lesion of the hypothalamus. The patient presented has a definite post-encephalitic syndrome, but with the polyuria excluded there are no pituitary symptoms. That the polyuria is due to a brain lesion has been insisted on before by Oschner, Camus and Roussy, Houssay, and Leschke. Recently Harve has described the pituitaries from several cases of epidemic encephalitis and one familiar with the structure of that organ would recognize in his description nothing which could not be found in any post-mortem pituitary. Recently, also, Maranon has described cases

where polyuria, adiposity and genital dystrophy have followed epidemic encephalitis.

DR. BENJAMIN T. BURLEY spoke of the contagiousness of the disease. In one instance only had he seen people living in the same house attacked. He also mentioned a case closely resembling the one reported by Dr. Thompson. The husband of this patient had died six months previous at the City Hospital in Worcester. He had been tapped and the fluid was bloody. The patient had a fluid of the same content. A sixteen-year-old son was taken sick four days after the mother and lived but seven days.

DR. L. J. THOMPSON mentioned a case of encephalitis at the Psychopathic Hospital that had hallucinations of sight upon which an autopsy was done. Very little was shown pathologically. Regarding contagiousness of the disease, there have been no cases at the hospital which might indicate such a fact.

DR. MYRTELLE CANAVAN mentioned two cases that were autopsied. One had a duration of eighteen days and the other twenty-three days. Both were typical clinical cases of encephalitis. One showed definite lesions around the third ventricle and the other did not show characteristic lesions around the ventricle or in the cortex.

PRESENTATION OF A CASE OF PSYCHOSIS

DR. C. MACFIE CAMPBELL

DR. CAMPBELL demonstrated a case with a psychosis, simple from the point of view of its mechanism, but poorly represented in the textbooks and difficult of classification.

The patient was a young Italian girl of 24, who was perfectly well on March 3. On that day, at her work in a factory, another girl told her a great many things "a single girl should not know." She began to worry and felt queer, emotional and dizzy. She went out and took the Elevated, wanted to go to Forest Hills, but got out at Eggleston Square. Here she was in a very excited state, wanted to take off her clothes, felt that she had to demonstrate her purity. She was brought to the hospital, and when she came in she showed that she had some grasp of where she was. All that night she stood up and looked out of the window, she expressed some odd ideas, *e.g.*, God was cremating her, she didn't want to die in black. During the next four days she was very much disturbed; by the end of the week the whole excitement had passed away, and she was clear and her convalescence had been uneventful.

The mechanism of the case seemed simple. The girl lived a quiet, reserved life, was very critical of any approaches made her by any young man, lived rather more strictly than those around her, and was evidently very sensitive to the sexual topic. The conversation of another factory worker on these subjects excited her, inflamed her imagination, and in the psychosis she lived out a drama of being kidnapped as a white slave. She saw the world in a distorted way and had odd fragmentary delusions, some of which were

difficult to interpret. A year ago this girl had been rather upset by an Italian who was making advances to her. She came home very much excited and was emotional for two or three days. Then she passed into a condition where she spoke very little, and for two weeks she was looked upon as a sick girl. She did not go to work for six weeks.

The case is a recurrent psychosis; it is not a simple hysterical delirium of the wish fulfilment type; there are a few elements of rather odd symbolism. Schizophrenic features were present, but the condition was benign and did not pass into a condition of deterioration.

The advisability of trying to make the patient realize the significance of the attack was discussed. This is a type of disorder which plays a very large part in practical psychiatry, but which is, as a rule, discussed in a very inadequate way.

DISCUSSION

DR. DONALD GREGG asked if the patient had been given a mental test.

DR. A. W. STEARNS said that he had been reading lately some of the earlier psychiatric works and was much interested to note the ingenuity with which the assigned cause was used in diagnosing various mental diseases. Forbes Wilson, in 1841, may be taken as a type. Each writer had his own opinion as to etiology down to the recent materialistic period. It is a question whether history is repeating itself and whether modern writers are going to prove as ingenious as their predecessors in making use of such material.

DR. C. M. CAMPBELL, in closing, stated that he had not attempted to bring out the whole etiology. All that was known was that the girl was earning her living and working well until she left that morning for her factory. Her people noted nothing peculiar. Then came this conversation and after that she became dizzy and emotional. Naturally the efficient cause of such a psychosis is a complicated group of forces.

In answer to Dr. Gregg's question, he said that a standard test was not performed, but her general efficiency was about that of the level of her social group.

A METHOD OF PERSONALITY DIAGNOSIS AND EVALUATION WITH PROVISION FOR SOCIAL SERVICE PROPAGANDA

DR. GUY C. FERNALD

Recent advances in the study of defective delinquents owe much to the findings in the field of character, that component of mentality which connotes the quality thereof, in contrast to its degree, *i.e.*, intelligence. Those mental organizations eventuating in action or behavior are quite as significant as indices of personality efficiency as are those mental organizations which eventuate in thought and

TENTATIVE CLASSIFICATION OF BEHAVIOR DISORDERS USED AT THE PSYCHOPATHIC LABORATORY, MASSACHUSETTS REFORMATORY, CONCORD, MASS.

<i>Responsibility</i>	<i>Manifestations</i>	<i>Groups</i>	<i>Diagnoses</i>
Behavior disorders.	Annulled.	Alienations.	Psychoses. Epilepsies.
		Deficiencies.	Intelligence defects. Idiot. Imbecile. Moron. Subnormal.
	Limited.	Aberrations.	Psychoneuroses. con'l psychopathies, neuro'l disorders. endocrinopathies.
		Entire.	Habits of action.

<i>Diagnoses</i>	<i>Super normal</i>	<i>Normal or adult</i>	<i>Sub-normal</i>	<i>Institutional</i>
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Psychoses:
 Recoverable,
 Recurrent,
 Ch. without deterioration,
 Ch. with deterioration,
 Traumatic,
 Alcoholic,
 Syphilitic,
 Senile,
 Arteriosclerotic,
 Brain tumors.
 Myxedematous.

Epilepsies:
 Grand mal,
 Petit mal,
 Jacksonian,
 Masked, etc.

Intelligence defects:
 Idiot,
 Imbecile,
 Moron,
 Subnormal.

Psychoneuroses:
 Hysteria,
 Psychasthenia,
 Neurasthenia,
 Paranoid personality.

Constitutional psychopathies:
 Coördination psychopath,
 Sex psychopath.

Neurological disorders:
 Neurosyphilitic,
 Tremors, tics, chorea.

Endocrinopathies.

*Characterial deviations.

its expression. In actual daily usage and in juridical procedure each personality is held accountable for his behavior, the product of character briefly and not for his thinking, the product of intelligence.

Characterial deviations and rectitude may not be, as yet, technically tested and numerically scored; but are susceptible of presentation by scientific description as are the findings of psychiatrists to the insane. The three fields of inquiry are, viz.: Mental disease, intelligence and character.

The outline is susceptible of such modifications as are required for adaptation to a given group and is submitted for its possibilities rather than as a compendium.

No form of presentation is complete which does not recognize the limitations of categorization. Search must be made in the character of an individual for the strength of will needed for overcoming tendencies to sloth, *e.g.*, which often defeat the success of those of high as well as those of a lower degree of intelligence. Failure, sociologically and economically, is at least as often due to mediocrity of ability to continue to pursue a well-selected purpose as to paucity of academic knowledge of the course to pursue. Of two imbeciles incapable of self-determination, the one living happily and usefully on a farm as chore boy, trusted within limits, but always supervised, the other of no higher grade of intelligence, a tramp who will beg or pilfer, but will not work, the one does as well as he may, while the other does not. The essential difference lies in the field of character.

The psychiatric personality investigator's method of choice, then, is first to determine the presence or absence of mental disease, then to canvass the mentality for intelligence age level and for the determination of characterial deviations and rectitude, the last to be presented in the form of scientific description.

There followed a detailed psychopathic case presentation and several case abstracts illustrating combinations of psychiatric entities as found in the Massachusetts Reformatory Hospital clinic.

DR. WILLIAM HEALY, in commenting on the whole matter of the use of mental tests and the uses that have been made of them for alleged determination of conduct prognoses and the outcome of character traits, said that he was glad that Dr. Fernald was emphasizing the study of character as a thing by itself. Even in the study of individuals from the standpoint of vocational possibilities mental tests, which are nowadays so much advocated, are by no means sufficient. As a well-known silk manufacturer said, mental tests, except for clerical workers, did very little in the way of giving him useful information in his large factories. And recently a paper has been published, based upon investigations in this factory, in which it comes out clearly that there is very little correlation between the behavior prognosis—that is, the success at work—and the results

*Specified in case notes and there associated, contrasted and illustrated. Certain observed deviations of frequent occurrence are the following, viz.: Too egocentric, lacks self-respect, sex conflict, antisocial, lacks definite ambition, acquisitiveness unchecked, too labile emotionally, unamenable to reason or authority, etc., lib.

on mental tests in the factory at large. Some of their most reliable individuals are people of very poor mental capacity. Indeed, it would seem that one would have to be pretty dull to be thoroughly happy pasting labels on boxes for eighteen years. Along this line was a case that Dr. Healy saw years ago: A young man appeared in court, accompanied by his employer, who was very anxious to pay the fine for a slight delinquency. He explained that the offender was the only one he had ever had who did his particular bit of work satisfactorily. The young fellow turned out to be definitely defective. The employment was in connection with a laboratory, keeping things clean. Thus there are very necessary phases of industrial life in which intelligence is even a handicap to good performance. It all brings out the fact that the study of character and temperament has a great deal to do with both good conduct and bad conduct. The viewpoint of Aristotle cannot be assented to, namely, that good intelligence would prevent a man from doing wrong, that if he was not a fool he would not do wrong.

But another trouble is in making studies by means of so-called intelligence tests all the elements of intelligence are not considered. This is coming out clearly in a symposium on intelligence tests that is appearing in the *Journal of Educational Psychology*. It seems to have taken psychologists considerable time to grasp this point, but now they are beginning to feel that intelligence tests do not cover the entire mental field.

Dr. Fernald's categories are decidedly useful for practical view of the situation, but Dr. Healy feels that the idea of responsibility is altogether too difficult to be placed among the categories. It is not open to exact thinking. What is responsibility? How can it be measured and recognized? It is a metaphysical conception which cannot be clearly defined and it has nothing to do with the practical handling of very many cases. It is time that psychologists and psychiatrists taught the practical issues of this question plainly to the legal profession. The law attempts to demand the answering of questions that cannot be answered.

DR. FERNALD, in closing, remarked on the importance of character in the life activities of an individual. Defective intelligence is stationary. It must be taken as it is and cannot be improved upon, but character growth can be stimulated and improved as may be observed as a result of social service endeavor.

Current Literature

II. SENSORI-MOTOR NEUROLOGY.

2. CRANIAL NERVES.

Schulte, J. E. TRIGEMINAL NEURALGIA. [Nederl. Tijdschr. v. Geneesk., September 4, 1920.]

Röntgen irradiation is here recommended as legitimate after failure of internal measures and electricity. Alcohol injections or excision are further steps in the process of more radical procedure should the radiations prove unserviceable.

Härtel, F. INTRACRANIAL INJECTIONS IN TRIGEMINAL NEURALGIA. [Deutsch. med. Woch., April 29, 1920.]

The author has used the intracranial method for seven years, and as a result in fifty cases a permanent cure of trigeminal neuralgia he believes has resulted. Permanent analgesia of all three branches of the trigeminus assures a permanent cure. Cures of over seven years' standing have followed a single injection. In case only partial analgesia is established, recurrences can be expected. The recurrence can be cured by repeating the injections. In psychogenic cases, which Härtel maintains do occur, and cases of doubtful diagnosis, intracranial injections should not be given. Partial analgesia, omitting the ophthalmic nerve, is technically possible, and is indicated in mild cases in order to spare the cornea, in spite of the fact that this exposes to recurrence. He sometimes determines in advance, by means of a röntgenogram, the size of the foramen ovale and whether there are any anatomic peculiarities in that region. In 41 cases thus treated over six months ago, a complete success was realized in 21 and partial analgesia in 16; 25 have been free from recurrence to date, the intervals since from seven to two years in 13.

Barlow, R. A. SPHENOPALATINE GANGLION HEADACHES. [Mich. State Med. Soc. JI., July, 1920.]

The author calls attention to a sphenopalatine sympathetic headache which may be separated from the migraine medley. Twelve instances are analyzed. The diagnostic criteria are too hazily outlined to permit fidelity in a short abstract and hence reference to the original is necessary.

Ranzi, E. EXTIRPATION OF THE GASSERIAN GANGLION. [Wien. klin. Woch., May 20, 1920. B. M. J.]

Trigeminal neurectomy has been performed in sixteen cases at the First Surgical Clinic of Vienna. Three patients died from the operation, one

as the result of an embolism during the operation, and two from meningitis some days later. Thirteen cases recovered, and reports were available in ten, in which the operation had been performed at periods varying from nine years to seven months previously. None of the patients had had a true relapse, and only three stated that they had had slight transient pain from time to time. No ocular damage from section of the first branch was observed. The figures showed that while extirpation of the gasserian ganglion is a more dangerous operation than injection of alcohol into the ganglion, the end results were more satisfactory. Krause's method for exposing the ganglion was at first adopted, but subsequently Cushing's was substituted. The difficulty in the operation depended chiefly on whether the hemorrhage was severe; if so, it usually came from the middle meningeal artery.

de Lamothe, D. SIXTH NERVE PALSY ON THE SIDE OPPOSITE TO AN ACUTE SUPPURATIVE OTITIS. [Rev. de Laryngol., Otol., et Rhinol., 1920, April 15, p. 198.]

A girl of nine years had acute right mastoiditis; two days later total right mastoidectomy was performed. Next day headache and incoercible vomiting of cerebral type, but without pyrexia or meningeal signs; spinal fluid normal, no hypertension. Five days later spontaneous horizontal nystagmus to left, with an intermittent pulse; spinal fluid clear under slight tension. Three days later symptoms of acute meningitis, with a turbid spinal fluid under great tension. Two days later lumbar puncture gave relief, but diplopia now disappeared, due to a complete left abducens palsy. The spinal fluid contained a large quantity of fibrin. The patient was treated by daily lumbar puncture (15-20 c.c.) and intraspinal injection of 5 c.c. of electrargol. Complete recovery in about seven weeks. The writer attributes the sixth nerve palsy to the existence of a serous meningitis. As to its occurrence on the side opposite to the acute otitis, he thinks there must have been some special anatomical disposition present, or possibly a constitutional fragility of that particular left sixth nerve which rendered it more vulnerable than its fellow on the side of the otitic lesion. In his case it was the hypertension of the cerebrospinal fluid, and not any infection of it, that was responsible for the palsy. [Leonard J. Kidd, London, England.]

De Lavergne and Zoella. SCHICK REACTION IN POSTDIPHTHERITIC PARALYSIS. [Bull. de la Soc. Méd. des Hôp., July 2, 1920. J. A. M. A.]

It is impossible to base a retrospective diagnosis on the findings of the Schick diphtherin test, according to these authors. It may be negative even with pronounced diphtheritic paralysis. To give antitoxin for sequels of diphtheria when there is a negative Schick reaction is contraindicated.

Garland, J., and White, P. D. PARALYSIS OF LEFT RECURRENT LARYNGEAL NERVE, ASSOCIATED WITH MITRAL STENOSIS. [*Arch. Int. Med.*, September 15, 1920.]

These authors present nine new cases to the sixty-one already recorded in literature. The article gives a useful summary of the syndrome.

Parrel. DEAF MUTISM. [II Morgagni, February 15, 1920; *Paris Méd.*, December 27, 1919.]

The author says that absolutely pessimistic views about deaf mutism should not be held, for by careful and prolonged training encouraging results can be obtained. The condition is usually the result of bilateral deafness, acquired or congenital, total or subtotal. Consanguinity of the parents, syphilis, tubercle, rickets, alcoholism, or plumbism may account for some cases. In a few cases evidence of meningitis in intra-uterine life has been found; the condition is relatively common in certain mountainous regions. Acquired deafness may be the result of otitis (especially after scarlet fever), meningitis, injury, etc. Total deafness is rare, so that it is important to look for any residue of hearing that may be present. Having regard to later instruction in lip reading, one should test the visual acuity. Treatment may be divided into (1) early physiological treatment given before the age of 7, and (2) pedagogic treatment given subsequently. Any existing ear or throat trouble must be cured as far as possible and the general health maintained; respiratory and phonetic exercises should be assiduously practised, the tactile sense cultivated, and various speech movements practised by imitation. After seven years a specialized instruction should be given and continued for at least eight years.

Aboulker, Henri. MÉNIÈRE'S VERTIGO AND DECOMPRESSION. [*Rev. Neur.*, 1919, No. 6, June.]

The term Ménière's vertigo, although discarded in modern otology, is here used to indicate nonsuppurative labyrinthine conditions, without reference to pathogeny. The syndrome is characterized by deafness, tinnitus, vertigo and vomiting. There is, moreover, a clearly localized occipital headache and a point painful to pressure at the lower edge of the mastoid. Aboulker believes that there is true intracranial hypertension in vertiginous individuals, which reacts upon the labyrinth. Lumbar puncture, demonstrated as of advantage in treating vertigo by Babinski, has almost always been of value. The amelioration can only be explained by the fact that the sudden decompression of the posterior inferior region of the meningeal cavity reacts upon the intrapetrous and extrapetrous labyrinthine passages. Contrary to the usual indication of intracranial hypertension the spinal fluid frequently flows drop by drop, even in dribblings. The patient nevertheless finds relief for a

longer or shorter period after each puncture. This same peculiarity of the spinal fluid has been noted at times in cases of cerebral tumor and abscesses. Claude's manometric puncture is therefore advisable. Trepanning is justifiable in serious labyrinthine states when in addition to the three characteristic symptoms there is a zone painful to pressure in the occipital region, occipital headache, radiating hemicranially or over the whole head, and evident relief, even though only fleeting, is obtained from lumbar puncture. Aboulker injects 6-11 c.c. of a 1 in 200 solution of novocain plus a drop of adrenalin per c.c. The line of injection follows the rectilinear, curved or crucial line of incision. The solution is colored with a few drops of methylene blue to outline the anesthetized zone. Incision is made in from one to two minutes after massage of the region. Five to six c.c. of the solution are injected into the fascia and muscles in contact with the bone and then anesthesia is complete. Incision into the dura mater and brain is absolutely painless. The 6 centigrams of novocain used represents the toxicity of a centigram of chloride of cocaine, the amount required to pull a tooth. The hand trepan is the ideal instrument for the operation. A crown is made slowly and enlarged with forceps gouge as desired. The operation may last twenty to thirty minutes; it is facilitated by the injection of a centigram of morphine to calm the patient. Two patients on whom Aboulker operated by this technique made a perfect recovery, after having suffered excruciating headaches and violent attacks of vertigo for some time previous to operation.

Sicard, R., and Robineau. ESSENTIAL NEURALGIA OF PALATE AND PHARYNX. SURGICAL TREATMENT. [Revue Neurologique, March, 1920.]

The symptoms consist of acute paroxysmal pain in the palate and pharynx on one side. There was no evidence of syphilis and the case was rebellious to treatment. The pains were accompanied by objective reactions like those of trifacial neuralgia and the patients were frequently suicidal. The treatment advised was a section of the glosso pharyngeal, the pharyngeal branch of the pneumogastric, and the superior cervical sympathetic ganglion. In the first case the trunk of the pneumogastric was cut by mistake so that there resulted a paralysis of the vocal cord and in the second case the hypoglossal nerve was also cut with a resulting atrophy of the tongue. In the third case the treatment, as advised, was carried out. In all three cases the pain was promptly relieved. [Camp.]

Wilson, F. N., and Herrmann, A. R. CARDIAC BLOCK. [Arch. of Int. Med., August 15, 1920. J. A. M. A.]

That complete bundle block produces characteristic changes in the form of the ventricular complex both in animals and in man is the claim

made by Wilson and Herrmann. Delayed conduction of the impulse through the branches of the His bundle (incomplete bundle branch block) produces ventricular complexes which are transitional in form between the normal ventricular complex and complexes characteristic of complete bundle branch block. The T deflection is produced by the reactivation of the ventricular muscle. In Lead II of the dog the upstroke of T in right bundle branch block is mainly a left ventricular effect; the downstroke of T in left bundle branch block is mainly a right ventricular effect. There is little experimental evidence to indicate that lesions of the subdivisions of the branches of the His bundle or their arborizations produce those changes in the form of the ventricular complex usually attributed to arborization block. Until such evidence is brought forward the diagnosis of arborization block rests on an insecure foundation.

Fussell, M. H., and Wolferth, C. C. AURICULOVENTRICULAR RHYTHM AND PAROXYSMAL TACHYCARDIA. [Arch. Int. Med., August 15, 1920. J. A. M. A.]

A case is reported by Fussell and Wolferth with a history of attacks of paroxysmal tachycardia occurring over a period of more than forty years; an ability to interrupt the fast rate with temporary cessation of cardiac activity; periods of slow temporary cessation of cardiac activity; periods of slow rhythm with interspersed short runs of about the normal rate; abundant clinical evidences of myocardial disease and decompensation. The electrocardiographic tracings showed left ventricular preponderance, depressed conductivity, periods of sinus rhythm alternating with auriculoventricular rhythm, and paroxysmal auricular tachycardia. Observations were made in respect of the alternations of the pacemaker between the sinus and auriculoventricular nodes, variations in rate, relations of auricular systole to ventricular systole. The significance of these phenomena is discussed. The paroxysmal tachycardia was determined as auricular in origin by analysis of curves of offset and onset. The method by which the patient obtained interruption of the tachycardia is described, and an attempt made to evaluate the factors responsible for the behavior of the heart during the period of interruption.

Vernieuwe. SPINAL ACCESSORY SYMPTOMS OF THE ORIGIN. [Rev. de lar., d'otol., et de rhinol., September 15, 1920.]

A woman, aged 45, had a sudden development of a neuritis of the spinal accessory. The diagnosis of a malignant tumor of the middle ear was made. The neuritis was manifested by pain in the shoulder, two spinal accessory tender points, and a slight degree of contracture in the trapezius and sternomastoid. The neuritis was due to compression of the nerve by the enlarged substernomastoid glands, which indicated the presence of a new growth.

Rich, A. B. INNERVATION OF TENSOR VELI PALATINI AND LEVATOR VELI PALATINI MUSCLES. [Johns Hopkins Hosp. Bull., September, 1920.]

The author here concludes that the fifth nerve is the motor nerve to the tensor veli palatini muscle.

Aboularage. FOUR CASES OF ABNORMAL TETANUS. [Il Policlinico, Sez. Chir., July 15, 1920. B. M. J.]

Two cases of delayed tetanus which were fatal and two of local tetanus which recovered are here reported. In the first two cases tetanus developed ninety days after the wound. (In the cases recorded by Jullien the symptoms developed one hundred and nine and one hundred and thirty-three days respectively after the wound.) The explanation of these cases is that the tetanus bacillus, or its spores, lie latent in the wound, or are englobed in the leucocytes, and subsequently become liberated as the result of a slight trauma, such as the cleaning up of an amputation stump, as in the writer's case. Contrary to the general rule in local tetanus, in which the incubation period is usually long, in one of the writer's cases it was only four days. The relatively mild course of local tetanus is attributed by Aboularage to three factors acting separately or in combination—namely, incomplete prophylactic treatment, a small number of weak virulence of the bacilli, and lack of receptivity of the spinal cord segments.

Roques and Condat. OCULAR SYMPTOMS OF TETANUS. [Gaz. des Hôp., Oct. 9, 1920.]

Roques and Condat relate a fatal case of idiopathic tetanus in which a pupillary symptom was notably pronounced. The case was not an example of so-called cephalic tetanus in which the facial nerves are involved, but was of the usual type. The pupils alternately dilated and contracted with a wide amplitude (pupillary nystagmus), without rhythm and independently of the usual factors. The tremor did not cease during sleep or under the full influence of chloral. The dilatation could not be explained by exacerbations of pain alone but bore a notable connection with an approaching paroxysm for which it acted as a certain warning, the pain doubtless playing a causal rôle. It was not absolutely certain, however, that the affection was not due in part to the action of chloral.

Bouman, L. BRAIN CHANGES IN TETANUS. [Nederlandsch Tijdschr. voor Geneeskunde, 1919, LXIII, H 2, 1931.]

Bouman has demonstrated to the Amsterdam Neurological Society the brain changes in a case of tetanus. A patient, suffering from paranoid delusions, jumped out of the window, fractured the spine, and after a few days had fatal tetanus. In the medullary substance of the pre-

central gyrus, hippocampus, thalamus, pons and cerebellum were found peculiar small foci, consisting chiefly of glia cells, also plasmodial glial structures, peculiar sausage shaped formations, and, especially at the periphery, rod cells. Some of the foci show a good many red blood corpuscles. When these foci occur, as often happens, at the boundary of cortex or of white matter, the neighboring ganglion cells show little or no change. Also the blood vessels show the characteristic infiltrations with plasma cells and lymphocytes that are found in other inflammations. The small cerebellar foci very closely resemble the bushes (*strinkjes*) found by Spielmeyer in the cerebella of cases of spotted typhus. In the molecular layer some of these foci extend throughout it, while others are more on its periphery. The largest foci measure about 0.4 mm.; many are smaller. These brain changes in tetanus closely resemble those found in the brain after experimental injection of the toxins of dysentery and of malaria. So far, Bouman has failed to produce them in rabbits by injection of tetanus toxine. The essential change in these toxic processes is a glial reactive proliferation without any proper inflammation. [Leonard J. Kidd, London, England.]

Achard, C. SEROTHERAPY IN TETANUS. [Progrès Médical, July 24, 1920. J. A. M. A.]

Achard describes a case of cephalic tetanus in a woman of 50, seven days after a fall wounding the brow. This form of tetanus is characterized by contraction limited to the muscles of the face and neck, associated very often with facial, sometimes ocular paralysis. The onset is slow, but diagnosis is rendered easy by this peculiar association of contraction and paralysis, while the trismus and presence of a wound nearby naturally suggest tetanus. Treatment is the same as in ordinary cases, sedatives and especially chloral in large doses. The results from serotherapy, though encouraging, are not yet decisive. Its preventive properties are no longer doubted, but its curative action is not yet constant. The serum should be given repeatedly in large doses for eight days, even if during the first days there are no signs of improvement. In this case injection of 440 c.c. brought sufficient improvement for the antiserum to be dropped.

3. SPINAL CORD.

Finlayson, A. D. ATYPICAL CASE OF PROGRESSIVE MUSCULAR DYSTROPHY. [Neur. Bull., November-December, 1919. J. A. M. A.]

The case cited by Finlayson is of interest for the following reasons: the onset at the age of 16 (although there is a possibility that there was facial involvement earlier); the absence of heredity; the first recognized appearance in the muscles of the shoulder girdle, and the absence of any appreciable degree of pseudohypertrophy. The case presents some of the symptoms of all of the three subgroups mentioned by Oppenheim.

About the time of puberty the patient showed a general lessening of physical strength, and at the age of 15, or about five years ago, definite muscular weakness appeared in the right upper extremity, then the left, and consecutively the back, hips, and lower extremities. Shortly after the muscular weakness made its appearance, atrophies of the muscles of the shoulder girdle were noted, and these have been progressive, until a typical "winged scapula" is present on each side. A résumé of the muscular condition is as follows: a slight weakness of the orbicularis oris giving a "tapir" mouth effect; weakness of all the muscles of the shoulder girdle to about one half of their normal efficiency; preservation of the muscular strength of the forearms and hands; a weakness of the anterior and posterior trunk groups, more especially the latter; weakness of the posterior thigh group and the anterior leg group, including the dorsiflexors of the feet and toes; no atrophies below the waist line, but possibly some hypertrophy of pseudohypertrophy of the high and calf groups. The mode of arising from a supine to an erect position and from a sitting to an erect position is particularly characteristic. The electrical reactions show only a quantitative change in excitability and in no instance was there an alteration of polarity. The onset, course, subjective and objective symptoms exhibited, including the mode of arising from the supine and sitting positions to the erect position, together with the electrical reactions, seem to indicate that the case is a primary myopathy of the progressive muscular dystrophy type.

Manson, J. S. HEREDITARY SPASTIC PARAPLEGIA WITH ATAXIA AND MENTAL DEFECT. [Br. Med. J], September 25, 1920.]

Four children are here reported upon who were affected by this disease. The children were normally born and developed regularly up to 7 and 8 years, when they began to stagger. This progressed and they were soon unable to walk to school. One died at 22 and one at 27. The survivors, aged 28 and 23, present the same syndrome. The father was the illegitimate son of an inmate of a workhouse and of an invalid man in the workhouse.

Kirstein. PRESSURE IN SPINAL FLUID IN PREGNANCY. [Arch. für Gynäkologie, 1919, 110, No. 2.]

No influence from the pregnancy could be detected in the testing of thirty-one pregnant women. Blood pressure, however, is always abnormally high in eclampsia when compared with the nonpregnant; eclamptic convulsion is probably due to an exceptionally high rise in the blood pressure. Attempts must be made to ward off the cerebral edema.

Dumont. FRACTURES OF ATLAS AND AXIS VERTEBRA. [Korrespondenzbl. f. Schw. Aerzte, 1919. No. 41.]

Dumont has reported an injury to the axis caused by a forward fall whilst skiing. Occipital neuralgia, difficulty in swallowing, and pain on movements of the head were present. A loud click could be heard when the head moved, and under x rays the odontoid process of the axis was seen broken off at its base. There was no injury to the cord and the patient made an uneventful recovery.

Mott, F. W. EARLY SYMPTOMS AND DIAGNOSIS OF DISEASES OF SPINAL CORD. [Br. Med. J., June 26, 1920.]

The author first dwells upon the functional and somatic diagnosis. He then discusses localization. The recognition of functional sensory disabilities simulating spinal cord disease is easy: the superficial sensibility to pain, heat and cold and touch is lost completely; there is no dissociation, neither the anesthesia nor the pains complained of conform to the anatomic distribution of spinal roots or peripheral nerves. The secret of success in the treatment of these functional cases is faith backed up by increasing knowledge. However, among the very numerous cases of functional disability there are many cases of mixed organic disease. These are frequent and one should attempt to separate the pathoneurosis, which is Ferenczi's term for the psychogenic admixture in a somatic disorder, and by appropriate psychotherapy aid this part of the disabling pathology. Just as Maloney has abundantly proven that many tabetics do not walk because of fear plus the tabetic loss; removal of the fear enables them to walk, whereas the tabetic lesion still remains but of itself is not so disabling. These commonplaces have been insisted upon for centuries but are continually being forgotten and rediscovered.

Henneberg, R. SPINAL FINDINGS IN SPINA BIFIDA (DIASTEMATOMYELIA, CONGENITAL SYRINGOMYELIA). [Monatsschrift für Psychiatrie und Neurologie, January, 1920.]

Very little has been written on the pathologic anatomy and the pathogenesis of spina bifida up to the present time, while practically no detailed study of it from the neuropathologic side has been made. Yet spina bifida is essentially a spinal affection, *i.e.*, a malformation of the medulla spinalis. The author has studied three cases in detail by means of serial cross sections, and presents a careful analysis of each case together with reproductions of many slides of interest. The first patient, an infant, at birth showed spina bifida at the lumbar portion of the spine, there was no tumor, but there was a surface the size of a date on which there was no skin. Moderate degree of hydrocephalus, yawning sutures, xerosis of the cornea, club foot, paresis of the legs. The infant died of malnutrition when it was about two months old. Postmortem exami-

nation revealed that the parietal and frontal bones were strewn with countless rounded and oval membranous lacunes, some as large as a bean. On the inner surface these were surrounded by flat and strong bony ridges. The spina bifida was unusually long, 11 cm. The entire sacral and lumbar column as well as the lower dorsal as far as 10 is involved. Thereafter the vertebra are abnormally broad but gradually narrow down. Brain, cervical column and cervical spinal cord could not be obtained. On opening the dura the upper dorsal spinal cord seemed normal, at the middle and lower dorsal column a distinct longitudinal sulcus is visible in the position of the rear line of closure.

The second patient had a pear shaped, somewhat soft tumor in the lumbar region. A cleft in the spinal column could be felt at the edge of the tumor. The left leg is flexed at a right angle at hip and knee and is rotated outward. Equinovarus position of the left foot, the inner edge of the foot being retracted. The right leg is extended. The foot shows calcaneus position. On postmortem examination the tumor was found to have collapsed. A bronchopneumonic focus was found. The cervical cord is strikingly broad. At the eleventh dorsal segment the spinal column seems to merge into the sack well and root fibers continue through the side of the tumor. The third patient had an abnormally large head with all head sutures gaping, the fontanelle was somewhat tense. There was a cephalhematoma over the left parietal bone, and in the region of the lumbar portion of the spine a reddish tumor larger than a goose egg of tense consistency. Flaccid paralysis of the legs and edema: areflexia. The postmortem showed that after the tumor was removed from the spinal column that it was cleft from the first lumbar vertebra to the coccyx. The tumor did not cover the coccyx region, however. In the first case there was no cystic tumor, a partial rachischisis, or spina bifida existed. The second case presents type of spinal bifida, once described as myelomeningocele subcutanea, to which not many references have been made in literature. The third case shows the severe meningomyelitic degeneration with abscess. A point of interest in all the cases is that all show a more or less extensively developed diastematomyelia.

Netter, A. COMMON ORIGIN OF VARICELLA AND ZONA. [Bull. de l'acad. de Méd., June 29, 1920.]

The well known relationship between herpes zoster and acute infections is here illustrated by Netter, who has compiled from the literature fifty-nine cases in which herpes zoster was followed by chicken pox in the contacts, and ten cases in which varicella was followed by cases of herpes zoster.

Guillain, G., and Barré, J. A. A CASE OF PERIODIC PARALYSIS. [Annales de Médecine, 1919, VI, 5.]

The authors report observations on this illness described by Westphal, authentic cases of which are very scarce in medical literature. It was the case of a man of thirty-six years of age who intermittently, and especially at night, had attacks of paralysis of the upper and lower limbs. The intensity of the paralytic crises was variable, some being slight, some very marked. During marked paralytic crises electric excitation of the muscles was only diminished, tendon reflexes of the upper limbs were abolished, those of the lower limbs could be elicited. Then there were lighter paralytic crises when electric excitability seemed to be preserved and where there were reflexes in spite of the phenomena of motor failure. Guillain and Barré have also reported acute attacks, the abolition or diminution of the idiomuscular excitability. As noted in observations already published they have seen cranial nerves that have remained unaffected, so the soft muscles have preserved their contractibility and the bladder has always functioned normally in their patient.

Guillain and Barré lay stress upon the fact that this patient had normal cutaneous reflexes, contrary to the case in tendon reflexes. During the crises there was a manifest oligurie; the arterial pressure was not modified; hematologic examination gave no important data. The temperature taken during the attacks and in the intervals between has always been normal. In the observations on periodic paralysis already published no mention was made as to the results obtained from lumbar puncture. In Guillain and Barré's case several lumbar punctures failed to show any modification in the spinal fluid, either in color, tension, or chemical or cytological composition. The authors call attention to the fact that the Wassermann reaction for which the blood was twice tested, was found twice to be positive, but they questioned whether syphilis, of which the patient was moreover unaware, had any pathogenic value here. For in the numerous cases of syphilis of the brain and spinal cord the syndrome of periodic paralysis has not been found; moreover it should be noted that the spinal fluid in this subject did not show either the hyperalbuminosis or the usual lymphocytoses of neurosyphilis; to this should be added the fact that mercury treatment carried out for several weeks gave no results. The symptomatic *ensemble* and the clinical conditions gave them the clear impression that the patient was suffering from an intermittent intoxication. It looked as though poisons of unknown origin accumulated slowly during phases of immobility and rest and settled either upon the muscular fiber or upon the nerve conductors or the cells of the anterior horns of the marrow. It may be correct, say Guillain and Barré, to correlate periodic paralysis with certain cases of bulbospinal myasthenia which also have intermittent symptoms. [Author's abstract.]

- v. **Mayendorf, Niessl.** CONCERNING THE ORIGIN AND COURSE OF THE BASAL BUNDLE OF THE FASCICULUS LONGITUDINALIS INFERIOR. [*Archiv. f. Psychiat. u. Nervenk.*, 1919, Vol. 61, p. 273.]

Much study has been given to the relation existing between the fasciculus longitudinalis inferior and the brain cortex and subcortical ganglia from the point of view of conduction, but the course of the lowest stratum of fibers has nevertheless remained obscure. The author happened upon a brain which, though showing generally only the typical findings in a malaria affecting for the most part the temporal medullary wall, revealed extensive degenerative phenomena in the surrounding areas in such a way that the fasciculus longitudinalis inferior was outlined in its entire length, clearly exposed and preserved, as though specially defined for study. By making a cut with an unusual trend (in oblique sagittal direction from outward, forward, backward and inward) a level was laid bare in which the Weigert picture brought to light, clearly and unambiguously, all the relations concerning which heretofore there has been only subjective inference. It was shown that the basal strands of the fasciculus longitudinalis inferior with its descending leg originated in the spur of the external geniculate body in the form of a compact bundle and that the fibers for certain definite parts of the longitudinal bundle is from definite parts of the corpus geniculatum and not from the entire body. The basal leg of the longitudinal bundle, sharply contrasting with the surrounding tissue which had undergone profound degeneration, was discernible running from backward forward until, turning upward at a sharp angle, it disappeared from the level of the cut. It was incontestably proved that there is no supply of fibers to the compact bundle of the fasciculus longitudinalis inferior from the surrounding convolutions, and just as clear was the fact of the abrupt bend of the entire bundle of fibers not far from the apex of the temporal lobe without any radiation of fibers. Thus the existence of the knee or bend projecting sharply upward without connection with the adjacent lobe, about which there has been so much controversy, was established. Very definite indications concerning the occipital end of the inferior longitudinal bundle were also given in the author's example. The horizontal leg could be traced to the most posterior and inferior convolution distinguished by the Vicq d'Azyr medullary stripe. Microscopically examined it appeared that the medullary path runs only into the anterior of the two summits of the convolution, but connection with the posterior is not definitely excluded. Thus it was possible to follow the basal bundle of the fasciculus longitudinalis inferior from its origin in the external geniculate body to the cortex of the lower lip of the fissura calcarina. To what part of the calcarine region the two summits of the convolution belong is obvious when the direction of the cut is taken into consideration. The trend was from inward behind to outward and forward, so that when the cut took in the temporal transverse convolu-

tion it would have to pass through the *anterior* medial part of the occipital lobe. The localization of the basal bundle is thus definitely determined. These findings add nothing new to what was already known of the mode of degeneration in the external geniculate body. Henschen and others have called attention to localizations within the geniculate body and Henschen, dividing the fibers into a dorsal and a ventral part, draws inferences concerning a difference of physiological attributes. Taking into consideration the anatomical connections and histological peculiarities of this region, the author is of the opinion that no associative function is to be ascribed to the ganglia of the external geniculate body, but holds with Minkowski, who made extirpation experiments in dogs to determine the relation between the optic fibers and the geniculate body, that its function is to increase intensity of stimuli. He also points out the significance of the discovery that the fasciculus longitudinalis forms a bend in the temporal lobe without supplying or receiving fibers therefrom, for the interpretation of its function, and, discussing the question whether it is to be regarded as a projection system or a long association path, shows upon what slight evidence this bundle has been assumed by various writers to be a path of association between the temporal and occipital lobes. [J.]

Török, Sarah. CONCERNING A TRUE PICK'S BUNDLE. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. 46, p. 124.]

The author examined the medulla oblongata of a paralytic. The form had been preserved and when the cross sections were colored according to the Weigert-Pal method there was discovered, beside the degeneration of the fasciculus gracilis and partial degeneration of the fasciculus cuneatus (1) a unilateral Pick's bundle; (2) in the substantia grisea centralis to the right fine small bundles of fibers running in sagittal direction and on the left four or five delicate bundles of fibers; (3) a heterotopy on both sides in the nucleus nervi hypoglossi. The bundle of Pick consisted of fibers of various diameter in closely arranged order running in sagittal direction. It was surrounded by an opaque medullary sheath which, when strongly magnified was found to consist of fine circular fibers which had separated from the bundle itself and encircled it. It was difficult to distinguish these from the trigeminal fibers which lay near them. In all probability the bundle of Pick is of pyramidal origin. The fasciculus leaves the pyramidal path after the decussation, being distinguished therefrom by the darker coloring. From the point of divergence it tends toward the ventrolateral border of the subst. gelatinosa, here bending upward and ascending in cerebral direction, so that it attains to the height of the vagus. What then becomes of it is doubtful. The author's observations indicated that fibers from the bundle pass with fibers from the corpus restiform into the cerebellum, or it may be that the fibers end in the restiform body. This finding is in accord with

that of most other writers so that the bundle may be regarded as a connecting path between the cerebrum (*i.e.*, the gyrus cent. ant.) and the opposite cerebellar hemisphere. Probst mentions a pyramidal bundle bending backward in a similar manner in a rabbit in which experimental degeneration of the pyramids had been produced. In cases of hemiplegia also the concurrent degeneration of the bundle of Pick reveals the cortical or pyramidal origin of this fasciculus. In regard to the second findings, the small bundles on the right of the central gray substance which at the level of the vagus root turned in ventromedial direction and attained the nucleus triangularis, the author states that they probably form an association path between a lower and higher nucleus of the oblongata, though they might represent a heterotopy of the white substance. The third findings, the oval, sharply defined gelatinous substance at the level of the decussatio lemniscorum, on both sides of the nucleus nervi hypoglossi, the author regards as a heterotopy in Obersteiner's sense of "gray in gray." These abnormalities are interpreted as the result of irregular architectonic, to which, according to general observation, the pyramids are greatly inclined—a view further confirmed by anomalies of structure in the rhombencephalon fibers. The author adds that dysarchitectonic formations are frequently found in paralytic brains. [J.]

Franckenberg, Walter. THE DEVELOPMENT AND HISTORY OF THE CENTRAL CANAL IN THE HUMAN SPINAL COLUMN. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. 52, p. 212.]

The author, describing the development of the central canal, states that in the embryonal state it is a large tube containing the original lymph (Urlymphe) clothed on all sides with a single stratum of cylinder epithelium. The closing of the canal takes place normally before puberty, but many deviations and abnormalities are met with. In certain pathological conditions there are lively proliferations in the vicinity of the canal with increase of the ependymal cells, in other cases enlargement of the canal, as in hydromyelia, which is a disturbance depending on congenital defects of development, met with in various deformities of the canal, especially in spina bifida. In many chronic diseases there is often increase of ependymal cells and the central canal is larger than in normal, as in multiple sclerosis, tabes, lues, cerebro spinalis, progressive paralysis, brain and spinal tumor, hydrocephalus internus, myelitis, and even in traumas. The behavior of the proliferating ependymal mass and of the central canal is similar in all these cases, but it cannot be considered as always conditioned by the disease. In many cases a so-called "formative stimulus" is effective on the ependymal cells leading to proliferation of the glia fibers. On the other hand, processes of shrinking may enlarge the canal. The frequency of anomalies of development can easily be ascertained if, as in the author's clinic, the vertebral column

of every case brought to autopsy is systematically examined. In syringomyelia the central canal shows very characteristic behavior. On the cross section, in places, there may be a simple enlargement, with or without diverticulum formations with apparent or real duplication or triPLICATION of the canal. In other places there is absence of the lumen on the cross section and in place of it increase of ependymal cells; often the lumen is not in the center of the gray substance but further toward the periphery. Sometimes the canal is confluent with the newly formed syringomyelitic cavity and the partial covering of the space with ependyma shows that the central canal had previously been situated at that place. Changes of the central canal, however, do not belong to the regular findings in syringomyelia. In nearly half of the cases examined by the author there was, in the center of the cross section, a small accumulation of roundish epithelial cells, so-called ependymal threads, or a narrow lumen surrounded by a single stratum of cylindrical epithelium. The syringomyelitic cavities are usually found entirely independent of the central canal in the gray substance of the anterior horn or in the ventral section of the posterior columns and are usually without epithelium. The fact that frequently the syringomyelitic cavities are connected with the central canal led former writers to assert that there is no essential difference between hydromyelia and syringomyelia, but the former is an enlargement of the canal existing from early embryonal times, while in syringomyelia the cavity lies in the spinal medullary substance outside of the central canal having nothing to do with the latter and for this reason it is not clothed with ependyma, except in those cases where it has become united with the central canal. These cavities develop usually from a primary gliosis connected with rarification of tissue. What the rarification process is and what becomes of the destroyed tissue is not known. Hydromyelia may be concurrent with syringomyelia, but a sharp distinction should be drawn between the two diseases. [J.]

Nové-Josserand, G., and Rendu, A. PAIN FROM ENLARGEMENT OF LUMBAR VERTEBRA. [Presse Méd., July 28, 1920. J. A. M. A.]

In an examination of the lumbar vertebra in cases of pain in the back, these observers found that in 19 instances the fifth lumbar vertebra had been enlarged. This malformation was bilateral and symmetrical; in six others it was unilateral. The redundant bone was excised to relieve mechanical pressure. Operative intervention has not proved a decided success and patients are seldom sick enough to accept it.

André-Thomas and Jumentié, J. UNILATERAL INFERIOR MEDULLA SYNDROME. ROTATORY NYSTAGMUS. [*Revue Neurologique*, January, 1920. Soc. de N. et P. Seance, January 4, 1920.]

A case showing the syndrome of Avellis but accompanied by a rotatory nystagmus. The nature of the lesion is undetermined. The symptoms developed suddenly after a short sickness which had been diagnosed as intestinal gripe. [Camp.]

4. MIDBRAIN; CEREBELLUM.

Gabbi, U. OCULOCARDIAC REFLEX IN LETHARGIC ENCEPHALITIS. [*Giorn. di Clin. Med.*, March, 1920.]

Four cases of lethargic encephalitis, two adult and two children, were examined by Gabbi to determine the Aschner reflex phenomena. The ordinary technique was used, the pulse rate and sphygmographic tracing being taken before, during and after ocular compression, and the blood pressure before and after. The compression lasted ten seconds. The results were as follows: (1) The pulse rate sank on the average from 88 or 90 to 60 or 62, and the pulse became stronger and irregular; (2) the blood pressure after the compression fell from 90 to 82; (3) the sphygmographic tracing during the compression showed a higher ascending line and more marked oscillations. One of the children showed pallor, mental confusion, nausea, and a tendency to vertigo. Injection of 1 mg. atropine in adults and $\frac{1}{2}$ mg. in children had the following results: (1) Before ocular compression the pulse rate increased, and vasomotor changes appeared in the face; (2) during compression the pulse rate fell from 90 or 88 to 82 or 80; (3) the sphygmogram showed the same changes as before the injection. Exaggeration of the oculo-cardiac reflex in lethargic encephalitis is attributed by Gabbi to hyperexcitability of the vagus nucleus in the medulla.

Boyd, W. EPIDEMIC ENCEPHALITIS. STUDY OF CASES WITH NECROPSIES. [*Annals of Medicine*, July, 1920, Vol. 1, No. 1. J. A. M. A.]

A study of seventy-five cases with sixteen necropsies was made by Boyd. The pathology may be summarized as interstitial inflammation of the central nervous system with secondary parenchymatous degeneration. In a number of cases of cranial nerve disturbance the corresponding nerve fibers were pressed on by greatly dilated vessels, the nuclei being comparatively normal. In seven cases peculiar hyaline bodies apparently the result of degeneration were found in the central nervous system. Widespread hemorrhages were present in the serous membranes in three cases, pointing to a general septicemic condition. Vascular and degenerative changes were present in the kidneys in many of the cases.

Mantoux. ACETONE IN THE CEREBROSPINAL FLUID IN LETHARGIC ENCEPHALITIS. [Bull. et Mém. de la Soc. Méd. des Hôp. de Paris, May 27, 1920.]

A case of lethargic encephalitis is here reported upon which clinically showed pronounced somnolence, sometimes amounting to loss of consciousness, transient incontinence, and abolition of the knee jerks, and ending in rapid and complete recovery. Examination of the cerebrospinal fluid showed traces of acetone and amino acids.

Verrey-Westphal. EYE SYMPTOMS OF MESENCEPHALITIS EPIDEMICA, NARCOLEPTIC FORM. [Rev. méd. de la Suisse romande, September, 1920.]

Two case histories are here reported. The first presented an atypical homonymous and vertical diplopia. Examination showed pupils reacting normally and beginning atrophy of the optic nerves. Later there was paralysis of convergence and accommodation. The second patient had paralysis of accommodation with homonymous diplopia.

Chauffard. LETHARGIC ENCEPHALITIS. [Rif. Med., February 21, 1920.]

The author here discusses some problems connected with research in this syndrome. Whereas lymphocytosis was absent in previous years, the later cases have shown a fairly high percentage, sometimes associated with only a slight degree of hyperalbuminuria. Unlike the lymphocytosis of syphilitic or tuberculous meningitis, the type in question is temporary and may disappear. In lethargic encephalitis one may have (1) a series of inhibitory phenomena—for example, somnolence, ocular paralysis; and (2) an irritative series—for example, delirium, convulsions, myoclonus. Anatomically the chief seat of the lesions is in the cerebral peduncles, especially the *locus niger*. If there is any unity in the different types of the disease it must be sought in its pathogenesis rather than in its pathological anatomy. Probably it is allied to influenza and a nervous localization of that disease; the virus is probably filtrable like that of poliomyelitis and rabies. Encephalitis epidemica is held to be a better term than encephalitis lethargica, since stupor is by no means constant.

Valassopoulo. LETHARGIC ENCEPHALITIS AT ALEXANDRIA. [Bull. et Mém. Soc. des Hôp. de Paris, May 13, 1920.]

The author reports that early in 1920 there had been an epidemic of influenza in Egypt, and that several of the cases had been complicated by obstinate hiccough. At the same time there had been numerous cases of lethargic encephalitis (not only of the ordinary type but also of the myoclonic and ambulatory varieties), showing that there was a close relationship between influenza and lethargic encephalitis.

Ronchetti. CLINICAL FORMS OF EPIDEMIC ENCEPHALITIS. [Il Policlinico, Sez. Prat., June 21, 1920.]

Four types of epidemic encephalitis are described in this clinical contribution, a lethargic type, a type characterized by delirium, a spasmophilic type, and a neuralgic type. Of 32 cases recently observed by him 24 presented the classical syndrome (consisting of lethargy and paralysis chiefly affecting the fourth and seventh cranial nerves) in an almost pure state or accompanied by only slight symptoms of delirium or neuralgia. In three cases the delirious syndrome, the neuralgic syndrome, and the syndrome of electric chorea respectively existed in almost a pure condition; in three the myoclonic syndrome was associated with the classical type of lethargy and paralysis; in one case the neuralgic type was combined with the delirious type, and in one the myoclonic syndrome was associated with the delirious type.

Pardee, I. H. ACUTE RADICULAR EPIDEMIC ENCEPHALITIS. [Am. Arch. Neur. and Psych., July, 1920.]

See Abstract of this in JOURNAL, New York Neurological Report, May, 1920. Abstract in J. A. M. A. says: Five cases are reported by Pardee, but as all the patients recovered, only a clinical study could be made. The chief symptoms were: (1) sharp lancinating root pains; (2) paresthesia; (3) muscular spasms; (4) hyperesthesia; (5) delirium, and (6) fever.

Michail. OCULAR MANIFESTATIONS OF LETHARGIC ENCEPHALITIS. [Clujul Med., July 1, 1920. B. M. J.]

The author records three cases of lethargic encephalitis in persons aged 23, 27 and 45 respectively, who, in addition to paresis of the internal rectus, presented signs of papillary congestion, which in one case amounted to "choked disc." The functional symptoms consisted in one case of well marked retinal photophobia, and in another of profound disturbance in the peripheral perception of colors, giving rise to great reduction of the visual field. The macula lutea was normal in all cases.

Hoffman, R. V. EPIDEMIC ENCEPHALITIS IN NORTHERN INDIANA. [Ind. St. Med. Ass. J., July 15, 1920. J. A. M. A.]

The use of frequent spinal drainage and the employment of hypertonic solutions intravenously in selected instances of epidemic encephalitis are advocated by Hoffman as an addition to our therapeutic armamentarium.

Creyx. ACUTE ENCEPHALOMYELITIS. [Journ. de Méd. de Bordeaux, April 10, 1920.]

The author first spends some time on the century old polemic regarding terminology. The terms lethargic and acute encephalitis are not

suitable, he says, because the disease is polymorphic in its manifestations, as in acute poliomyelitis. The classical signs may be absent if those regions which are usually attacked happen to escape; then restlessness may replace lethargy, spasms paralysis. A history is related to illustrate an unusual form of the disease, in which clonic spasms of the diaphragm, sphincter trouble (retention of urine) and delirium constituted a clinical triad. The case is compared with some reported by Sicard and Kudelski under the name "acute myoclonic encephalitis," in which the disease was ushered in by fever and joint pains, followed by delirium and myoclonic movements particularly involving the diaphragm and abdominal muscles.

Cramer. LETHARGIC ENCEPHALITIS. [Rev. Mé. de la Suisse romande, May, 1920. Med. Rec.]

Cramer reports nine cases of the lethargic and thirteen of the insomnic form. The lethargic cases are divided into deliriant and non-deliriant forms, while the insomnic cases were all of the myoclonic type, and the majority were deliriant as well. Tutrettini and Piotrowski write on the effects of lumbar puncture, which they carried out in twenty-two of the twenty-five cases treated. They find a characteristic picture which is of value in diagnosis—albumin normal or slightly augmented, chlorides and tension normal, early lymphocytosis most marked in the oculo-lethargic cases and moderate and even absent at the début of cases of other types, diminution of lymphocytosis with regression of the disease, early augmentation of glucose. Puncture has no therapeutic value. Roch writes of the electric chorea of Dubini. He calls attention to the fact that there prevailed in Lombardy at the time of Dubini's paper another malady known as convulsivo-cerebral typhus, which was of the epidemo-sporadic type. This affection was recognized and named by Frua, who was one of the first to report cases of Dubini's disease. Whether Frua recognized the identity of these two affections does not appear from the author's text, but the name is preferable to electric chorea, which does not connote an acute febrile disease. Roch now gives in detail a case of myoclonic encephalitis which conforms very closely to the disease as seen by Dubini. The terms "electric" and "chorea" are especially well adapted to visualize the disease. Gautier writes on epidemic hiccough, which is lethargic encephalitis complicated by persistent diaphragmatic contractions. He narrates five cases of this type. Strange to relate, these spasms of the diaphragm were quite isolated and none of the cases were of the myoclonic type. Whether the hiccough is to be conceived as a monoclonus is uncertain. Dufour, who saw epidemic hiccough in Paris cases of encephalitis, records that one at least was of the myoclonic type, while Beclard saw cases with and without myoclonus. Fatal encephalitis with hiccough was seen in Berlin, and it is possible that fatal cases of hiccough known to have happened at intervals in the past may have been sporadic encephalitis.

Bandiera, E. MILLAD-GUBLER'S SYNDROME IN LETHARGIC ENCEPHALITIS. [Il Policlinico, Sez. Prat., April 19, 1920.]

A man of 70 years of age began to be ill with symptoms of irritation of the larynx and esophagus, difficulty in speaking and swallowing. He then began to show myosis of the right pupil with loss of reflexes and rigidity, right external strabismus and diplopia. There was a supranuclear paresis of the left facial, paresis of the muscles of the upper limb and of the right side. He also developed marked ataxia of the right lower limb and ataxia of the left lower limb. The tendon reflexes were unchanged. A lesion of the left half of the pons was probable. The symptoms began to recede after two weeks and gradual and finally complete recovery ensued.

Tarozzi. PATHOLOGY OF ENCEPHALITIS LETHARGICA. [Il Morgagni, April 5, 1920.]

From the pathological study of seven cases of epidemic mesencephalitis which came to autopsy, Tarozzi states that in every case there was clear evidence of pulmonary lesions of an influenzal type. In the majority of cases the ventricular fluid was increased in amount; the cerebrospinal fluid was clear and sterile; in two cases there was some leucocytosis. Punctiform hemorrhages in the brain were absent. The changes were those of irritative encephalitis, most noticeable in the pons and peduncles and medulla, and consisted chiefly in an infiltration of small round cells grouped about the small vessels, the veins more conspicuously than the arteries. Bacteriological examination of the pulmonary lesions demonstrated the presence of organisms of a diplo-streptococcal type. The author from a strictly pathological point of view is disposed to look upon lethargic encephalitis as a result of the influenza organism.

Maggiore, S. TREATMENT OF EPIDEMIC ENCEPHALITIS. [La Pediatria, April 1, 1920.]

The author here reports his results in the treatment of 9 cases—7 in children and 2 in adults—by injections of sensitized vaccines of Pfeiffer's bacillus. The treatment was thought to have a favorable effect on the fever, somnolence and ocular, respiratory, cardio-vascular and nervous symptoms. The injections only caused violent reactions in cases with hyperpyrexia; in all the others the reaction was slight. The good results might be attributed to immunity if the disease were regarded as influenzal in origin, or to protein therapy if it were regarded as not due to influenza. The frequency of injection varied with the intensity of the symptoms but on the average the vaccine was given intravenously or by subcutaneous injection every other day.

Zagari, G. TWO SYNDROMES IN LETHARGIC ENCEPHALITIS. [Rif. Med., March 6, 1920.]

From the numerous syndromes of this conglomerate the author delimits two general groups, an upper and a lower mesencephalic syndrome. The former is characterized by oculomotor pareses or paralyse, somnolence, and a more or less normal cerebrospinal fluid, preceded or followed by headache, shivering, vertigo, nausea, and restlessness and a febrile condition. The lower mesencephalic syndrome is diagnosed when paresis or other cranial nerves—fifth, sixth, seventh, ninth, tenth and twelfth are added to the picture. Bilateral paresis of the lower facial and of the motor branch of the fifth, ninth and twelfth occur, giving rise to deviation of the corner of the mouth, difficulty in swallowing and dysarthria, together with tenderness over the point of emergence of the trigeminal with anesthesia. The author also discusses other outlying syndromes in a nonsystematic manner (topographically considered).

De Rezende. BOTULISM OR LETHARGIC ENCEPHALITIS. [Brazil-Medico, June 5, 1920. Med. Rec.]

The patient presented a most unusual picture when first seen. He was at the time waiting on a physician in a restaurant and was seen to present ptosis. Asked about himself he complained of feeling ill and said he had double vision. He was advised to go home, but some delay resulted and it was not until three days later that he came under medical care. He then presented fever of 104° F. and delirium. This phase passed off and was succeeded by one of extreme prostration, accompanied by somnolence. Ptosis was still present, but diplopia seemed to have disappeared. The diagnosis at this period appeared clear—encephalitis lethargica. To register the peculiar physiognomy a photograph was taken and is reproduced in the journal. The subject improved in temperature and in his mental state. At this juncture Doctor Machado, who had been asked to see the patient, noted urticaria over the chest, which diffused itself over most of the surface and became more and more confluent. This phenomenon made the diagnosis somewhat doubtful and an attempt was made to exclude definitely certain other affections. The presence of certain symptoms, such as erythema and dryness of the mouth, makes for botulism. The patient during the outbreak of the eruption had suffered from dryness of the lips and tongue. His occupation as waiter in a restaurant may have exposed him to the *Bacillus botulinus*. Nevertheless, encephalitis lethargica has also presented rashes. The diagnosis seems to have been left unsettled.

Ronchetti. DISSIMILARITIES BETWEEN LETHARGIC ENCEPHALITIS AND DUBINI'S DISEASE. [Il Policlinico, June 21, 1920. Med. Rec.]

Ronchetti arrives at certain conclusions with special reference to the identity of the myoclonic form of sleeping sickness with the Dubini or

as he terms it Dubini-De Vecchi disease—electric chorea. In both syndromes, the ancient and modern, the mortality was high and especially in the older episode; Frua reports two recoveries from the Dubini disease to illustrate the rarity of recovery; and the mortality in general ranged from 80 to 90 per cent. Although Dubini's syndrome was styled a chorea, paralysis was very common and it was alleged to be present in over three fourths of all cases. The absence of eye symptoms in Dubini's reports has been used to discount the identity of the two affections but Pignacca, a contemporary, speaks of fixation of the eyes and strabismus. Ptosis as such is not mentioned. Dubini does not speak of lethargy but as it were goes out of his way to emphasize the intelligent and wide awake behavior of the patient. It is true that in one case he mentions lethargy but in this subject there was found at autopsy a focus of softening in the thalamic region. Pignacca goes a little further and mentions a terminal lethargy comparable with the stupor of typhoid fever. He also mentions the great frequency of convulsive attacks; of 36 subjects 25 showed epileptiform convulsions and therefore Frua proposed the name of "convulsive typhus" for the affection.

Litvak. ACUTE MYOCLONIC ENCEPHALITIS AND THE ELECTRIC CHOREA OF DUBINI. [Rif. Med., March 27, 1920.]

In 1846 a modest practitioner of the Milan Hospital, Dubini, published a monograph on "electric chorea," his study having been presented before the Congress of Scientists at Naples. The affection was apparently a new one and limited to Lombardy. The term "electric chorea" was devised to characterize the motor phenomena, which were of the sort seen in the ordinary or Sydenham chorea but resembling the contractions produced by the electric current. The muscular behavior was constant and pathognomonic. Next he mentions other symptoms as headache and pain in the nucha and spine. Other phenomena were fever, sopor, stupor or delirium, muscular rigidity, and other more or less vague symptoms. In these cases general convulsions usually developed and led to coma. The disease was so grave that of 38 patients but 2 recovered. Nothing characteristic was found at autopsy. Frua, a colleague of Dubini, later made the discovery that stupor was not a more complication but an integral part of the disease. Another colleague, Pignacca, noted four cardinal symptoms—the muscular shocks, muscular contractions, epileptiform attacks, and cephalic symptoms, including headache and somnolence. Half a dozen other Italians and a number of foreign physicians discussed the disease—the latter apparently only from the Italian descriptions. According to a recent study, cases of Dubini's disease were reported for about twenty years after his original description. The present author, however, shows that the condition was seen long after that period, for in 1884 Grocco wrote a monograph on it which included his personal cases. He was probably the first to grasp the

infectious nature of the malady. He fixed the seat of the process in the brain and cord. Despite some want of agreement the similarity between this affection and the epidemic encephalitis of to-day may possibly point to one and the same affection. [Med. Rec.]

McIntosh, J., and Turnbull, H. M. EXPERIMENTAL TRANSMISSION OF LETHARGIC ENCEPHALITIS TO A MONKEY. [Br. Jl. Exper. Pathol., April, 1920. J. A. M. A.]

McIntosh and Turnbull describe the reproduction of lethargic encephalitis in a Pafas monkey by combined intraperitoneal inoculation of filtered emulsion of cervical cord, pons and basal nuclei, obtained from a fatal case. On the sixth and forty-eighth days after inoculation the monkey had fits; after the second fit it was lethargic, rigid and trembling until death of the fifty-sixth day. Macroscopic and microscopic examination revealed no lesions in the viscera. An extensive microscopic examination of the central nervous system revealed engorgement, hyalin thrombosis, a very few hemorrhages into "perivascular canals," edema of certain cranial nuclei, extensive degeneration of bodies of neurons and an inflammatory infiltration confined to the posterior part of the left basal ganglia, focal areas of the cerebral pia and the wall of a vessel in the right trapezoid body. In its strict localization, its situation, its distribution in the affected areas and in its cytology the infiltration resembled closely that in human cases. A description is also given of the ambiguous result of similar inoculation of the emulsion, unfiltered, into a *Macacus* monkey.

Netter, A. LETHARGIC ENCEPHALITIS AND POLIOMYELITIS. [Médecine, August, 1920.]

Netter accents the differences in these two syndromes. While resembling poliomyelitis in many respects, epidemic encephalitis, he thinks, differs in the long survival of the virus in the nerve centers. Like syphilis he claims its course may show remissions after months or years. The relationship to cases classed as epilepsy, chorea, multiple sclerosis, paralysis agitans, manic excitement, visceral crises, etc., may be overlooked. Interestingly Netter returns to a medieval treatment procedure, *i.e.*, turpentine artificial abscess without appreciating at all the psychogenic factors involved in such a fixation method. He applied this in the eighty-three cases and the mortality was 7.46 per cent. in the sixty-seven cases in which an abscess developed, while all but one died in the sixteen cases in which the injection failed to elicit abscess formation. Seventy-five per cent. of the patients that recovered showed no complications. In ten he induced a second abscess. He also uses urotropin and adrenalin and says auto or hetero serum is dangerous.

Ottolenghi, D., d'Antona, S., and Toniello, F. ETIOLOGY OF LETHARGIC ENCEPHALITIS. [Policlinico, September 27, 1920.]

These observers report findings which confirm those of others regarding the filtrability of the virus found in the blood and spinal fluid of patients with lethargic encephalitis. This virus they report will transmit a disease to guinea pigs when injected into the peritoneum or brain. A disease is also produced contagious for guinea pigs when washings of the nasopharynx are instilled in the nostrils. Rabbits are also susceptible but only when the nasal mucosa has been scraped. Cats are also infectable, and brain substance of the cats is virulent for the guinea pig. The bacteriologic findings were negative save a streptodiplococcus was once found resembling that described by V. Wiesner.

Achard, C., and Ramond, L. ELECTRIC CHOREA. [Bull. de la Soc. Méd. des Hô., June 11, 1920. J. A. M. A.]

Achard and Ramond say that lethargic encephalitis has thrown light on the etiology of many types of chorea. It is probably responsible for certain cases of choreiform myoclonias and of acute chorea. Dubini's electric chorea is probably identical with it, but there is another form of electric chorea, the Henoch-Bergeron type, which differs completely from it, as they prove by the history of a case in 1904. It is mild and is cured by suggestion or tartar emetic, but it occurs in epidemic form. Of Bergeron's seven cases, three were encountered in one week.

Schiboni, L. LETHARGIC ENCEPHALITIS AND ACUTE MYELITIS. [Policlinico, September 27, 1920.]

This observer has seen some cases of ascending spinal paralysis of a myelitic type which were forms of lethargic encephalitis. The latter disease had been epidemic but was prevalent in the environs. He describes a case of myelitic type in a student which was fatal in six days.

Albruzzette. AMBULATORY ENCEPHALITIS LETHARGICA. [Rif. Med. January 31, 1920.]

A man, aged 44, who walked into the hospital, and while describing his symptoms, among which was a feeling of sleepiness, suddenly failed in his speech and fell into a profound lethargy. He was roused by shaking and proceeded with his conversation; very shortly to relapse into his lethargy. Two weeks previously he had a severe headache, and for three days had seen double. There was slight laryngitis, profound weakness, and intense sleepiness. After the diplopia had disappeared the sight did not return to the normal but remained misty. There was ptosis of the right eyelid. The symptoms lasted about twenty days and then all cleared up, the patient being able to be about the entire time.

Netter, A. TREATMENT OF LETHARGIC ENCEPHALITIS. [Bulletin de l'Académie de médecine, March 30, 1920.]

The number of recent cases of this disorder in the city of Paris is estimated at 1,500, and at 10,000 in the whole of France. Italy and Austria are known likewise to have suffered heavily from it. The author reports the results from various forms of treatment in seventy-two cases. Considering the disease, like epidemic poliomyelitis, to be due to a filterable virus present both in the nervous tissues and in the nose, throat and mouth, he thinks the treatment should be conducted along three particular lines, viz., neutralization of the virus directly in the nerve centers by the use of a specific or nonspecific bactericidal preparation; elimination of the poison by various routes, and stimulation of the general defensive activity of the organism. The first of these objects would be attained by intraspinal injection of serum from persons already recovered from the disease, but such a procedure cannot yet be recommended in this disorder, partly because the presence of a neutralizing principle in convalescent blood has not yet been demonstrated and partly because the course of the disease is so prolonged that a very large number of injections would have to be given. Administration of hexamethylenamine by mouth is, on the other hand, always to be recommended, though its exact utility is still in doubt. Neosalvarsan injections seemed to do harm in one case. Enlargement of the salivary glands and salivation having been noted in some cases, administration of jaborandi or pilocarpine to hasten elimination of the virus with the saliva is indicated. Adrenalin is always combined with it to antagonize heart depression by the pilocarpine, as well as to combat the asthnia commonly present in these cases and probably dependent upon fixation of the virus by the nerve cells of the endocrine organs. The measure most strongly advised by the author is the fixation abscess, instituted by injecting one or two mils of oil of turpentine in the outer aspect of the thigh. Hippocrates had already noted that in patients who recovered from lethargus a spontaneous abscess generally developed in some part or other of the body. Out of twenty-seven cases in which Netter injected turpentine, in nineteen an incisable abscess formed, and of these nineteen patients only one, a pregnant woman, succumbed to the disease, although fourteen of them had the myoclonic form of encephalitis, considered more deadly than other forms. Two patients out of the eight who did not form an incisable abscess succumbed before collection of pus had occurred, and the other six, in whom the turpentine had caused no local reaction, likewise succumbed. Out of twenty-five patients who received no turpentine injections, thirteen, or over fifty per cent., died. Fochier's theory that a fixation abscess draws away virulent matter from the general circulation to the point of injection has not been confirmed by experimental work, but the abscess does in some way yield benefit, probably by awakening a reaction in the organs in which the materials for defence against

the disease are formed. Netter's pupil, Mozer, has shown, at least, that the bone marrow participates in the reaction, throwing out myelocytes into the blood stream.

Hala, W. H., and Smith, C. M. CASE OF MENINGOENCEPHALITIS LETHARGICA. [Am. Arch. Neur. and Psych., February, 1920.]

The authors report a case, clinically diagnosed as encephalitis lethargica, verified by observations antemortem and postmortem. From the clinical viewpoint the author's case was one of meningoencephalitis, with lethargy and involvement of the motor fibers of the third, sixth, seventh, tenth and twelfth cranial nerves. The etiological cause was a gram negative motile bacillus, unidentified, but probably belonging to some intermediate class of colon-typhoid-enteritidis group. Pathologically, the lesion demonstrated septic meningoencephalitis and ependymitis, with punctate hemorrhages and perivascular cell infiltration of the centrum ovale, corpus striatum and optic thalamus.

Paleani. ETIOLOGY OF ENCEPHALITIS LETHARGICA. [Rif. Med., May 22, 1920.]

The author found in the cerebrospinal fluid in two cases of lethargic encephalitis a pathogenic germ capable of reproducing in the rabbit a characteristic group of symptoms, agglutinable by the blood of other cases of encephalitis (also of influenza), and belonging to the group of organisms which were associated with the recent epidemic of influenza. The germ grows best in broth and sugar agar, does not develop in gelatin nor coagulate milk, and does not ferment mannite nor acidify glucose; it has slight hemolytic action.

Dimitz, L. CHOREIFORM TYPE OF EPIDEMIC ENCEPHALITIS. [Wien. kl. Woch., February 19, 1920.]

Thirty-five cases of epidemic encephalitis came under this observer's notice in two weeks. Common to all these cases were a comparatively low temperature—a sudden rise of temperature was indicative of a complication—dryness of the lips, with crust formation and herpetic vesicles, often of a hemorrhagic character, flushing of the face, intractable insomnia, and motor excitability. This last phenomenon was characterized by recurrent but never rhythmic clonic contractions of uniform strength, or by what the author calls choreiform restlessness. This restlessness often came on gradually, the first manifestation being hiccough, or a short catch, referable to the region of the abdomen or small of the back. On scrutiny, short contractions of the abdominal muscles, including the diaphragm, were often noticed to be unilateral; they were sometimes confined to the right, sometimes to the left side. Frequently short clonic contractions of the limbs were also observed, either unilateral or bilateral. Sometimes these contractions were curiously like the semivoluntary contractions of hysteria.

Spiller, W. G. ACQUIRED DOUBLE ATHETOSSES OF EPIDEMIC ENCEPHALITIS. [*Am. Arch. Neur. and Psych.*, October, 1920. J. A. M. A.]

Spiller reports a case of the myoclonic form of lethargic encephalitis with intense muscular contractions of the myoclonic type in various parts of the body which terminated fatally. He found in microscopic sections a pronounced cellular infiltration of the region of the basal ganglions, but not confined to them. It occurred diffusely in the basal part of the temporal lobe. The intense perivascular cellular infiltration of the region of the aqueduct of Sylvius, so common in the usual form of lethargic encephalitis, did not occur in this case.

Boveri. LETHARGIC ENCEPHALITIS. [*Rif. Med.*, February 28, 1920.]

The author remarks that a bronchial or pulmonary localization is hardly ever found, either at the beginning or in the course of the disease; in this respect it differs from influenza. The paralysis of the eye and of the facial nerve is incomplete and variable, more like a diminished function of the muscles than a true paralysis; an ocular paralysis (for example, of the internal rectus) present during repose may disappear when the patient wakes. Paralysis of the ciliary muscle is nearly always present. Retention of the urine is not uncommon in the early stages. In the cases seen by the author albumin and globulin were in excess in the spinal fluid, but there was no true leucocytosis.

Zagari. ENCEPHALITIS LETHARGICA AND INFLUENZAL POLIOENCEPHALITIS. [*Rif. Med.*, March 20, 1920.]

The discussion concerning the relations of influenza to the encephalitis syndrome are very active in Italian medical circles. Are they two separate distinct diseases, or different forms of the same thing? The multiplicity of forms and variability of symptoms tend to throw doubt on the existence of encephalitis lethargica as a separate disease. Histological examination does not throw convincing light as to the specific character of encephalitis lethargica. Bacteriology, he says, does not enable one to decide definitely. In the first place authorities differ as to the true organism causing influenza, and this is equally true as to encephalitis lethargica. In addition, Zagari here believes less in a single causal agent and more in mixed infection, so that more than one organism may be the cause. This theory of mixed infection would at any rate help to explain the protean form of the disease. On the whole, in spite of certain facts which seem to link encephalitis lethargica with influenza, the author thinks that, before a definite opinion can be given, further knowledge must be obtained.

Hoke. POLYURIA IN LETHARGIC ENCEPHALITIS. [Wien. klin. Woch., June 24, 1920.]

A case of polyuria in a woman, aged 23, is here reported. She suffered from lethargic encephalitis of the myoclonic type; the amount of urine rose to 8 to 10 liters in the twenty-four hours. After injection of pituitary extract this fell to 3 liters. As it increased to over 5 liters a week later, another injection of pituitary extract was given, with the same result.

Levaditi and Harvier. VIRUS OF ENCEPHALITIS LETHARGICA. [Rif. Med., April 17, 1920.]

These observers have maintained that they have succeeded in reproducing the symptoms and pathological lesions of encephalitis lethargica in the rabbit, by inoculating the brain with gray matter taken from a patient dead from influenza. Similar positive results followed injection into the peripheral nerves. The symptoms reproduced consisted in torpor, myoclonus and phenomena of irritation. The virus, they say, cannot be cultivated by ordinary methods; it may be preserved in glycerin, and filters easily through a Chamberland filter. After various passages through rabbits it becomes a fixed virus, and kills the animal in four to six days. Similar reports have come from a number of independent sources, and also as many vegetative ones.

Reverchon and Worms. OCULAR SYMPTOMS IN LETHARGIC ENCEPHALITIS. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, May 13, 1920.]

Fifteen illustrative cases are here reported, in four of which the ocular symptoms appeared at the onset of lethargic encephalitis and in six at various stages of the disease, while in five the retrospective diagnosis of lethargic encephalitis could be made from the character of the ocular sequelae. In the first group the ocular symptoms predominated, so that the patients sought advice at an ophthalmic department. The first case showed complete paralysis of the third nerve, the second slight disturbance of accommodation, the third ophthalmic migraine, and the fourth attacks of transient amaurosis. The ocular symptoms during the course of the disease consisted in ophthalmoplegia, inequality of the pupils, weakness of response to light and accommodation, and in one case choked disc. In four cases there was an exclusively unilateral localization of the third nerve paralysis. In the rest the symptoms were bilateral in the form of more or less transient paresis, or more pronounced paralysis with ptosis (almost always asymmetrical), slight strabismus, and limitation of lateral and up-and-down movements. Nystagmiform jerkings towards the end of the illness were the most frequent expression of paresis of associated movements. Severe and often persistent neuralgia in the course of the ophthalmic division of the fifth nerve was frequent. The sequelae, which were noted some months and even years after the

attack of lethargic encephalitis, consisted of diplopia, weakness of accommodation, and persistent nystagmiform jerkings, frequently accompanied by other involuntary movements such as blinking.

Léri, A., and Gay, R. SPASTIC PARAPLEGIA AFTER EPIDEMIC ENCEPHALITIS. [Bull. de la Soc. Méd. des Hôp., June 18, 1920. J. A. M. A.]

The typical organic spastic paraplegia in this case could not be traced to traumatism, Pott's disease or syphilis. A history of an abortive epidemic encephalitis attack was observed.

McAlpine, D. MYOCLINIC SYNDROME IN ACUTE EPIDEMIC ENCEPHALITIS. [Lancet, August 14, 1920.]

The chief syndromy here described showed a beginning inequality of the pupils. There was added difficulty in urination, disturbance in speech, sweating, leukocytosis and trophic changes in the feet and hands.

Stroking the abdomen caused sudden shocklike contractions involving the lower segments, chiefly the left, causing the umbilicus to be pulled downward. A fine irregular tremor was present in both legs on voluntary movement and the tendon reflexes were slightly exaggerated. Similar shocklike contractions were present in certain muscle groups in the legs—especially in the peroneal group of the right leg and in the soleus, gastrocnemium of the left leg.

Bériel and Branche. LETHARGIC MENINGITIS, MENINGOENCEPHALITIS AND ENCEPHALITIS. [Lyon médical, March 25, 1920.]

The authors state that they have been struck by the occurrence, during the past year, of an unusual number of infectious states with special involvement of the nervous centers and presenting all intermediate types from radiculitis to radiculomyelitis, meningitis and meningoencephalitis. By their coincidental occurrence and curability these cases seemed to be allied. The most pronounced cases simulated tuberculous meningitis in their subacute course, cerebrospinal fluid reactions, temperature curve and admixture of meningeal and encephalic manifestations, but recovery took place. Lethargic encephalitis is but a single peculiar expression of an infection of the nervous centers that may appear in various localizations, though doubtless due to a single, as yet unknown, cause. One patient presented violent myoclonic seizures, and death took place in a continuous epileptoid paroxysm; the autopsy showed, histologically, a diffuse meningoencephalitis.

Muskens, L. TUMORS IN CEREBELLOPONTINE ANGLE. [Nederl. Tijdschr. v. Geneesk., July 31, 1920. J. A. M. A.]

Muskens describes with illustrations a case in which a gliosarcoma as large as a goose egg in the cerebellopontile region was relieved by

Cushing's technic, with the result that the impending blindness was warded off, and the woman of 27 had two months of relief. The first symptoms had been unilateral disturbance in hearing three years before; six months later vomiting, and after another year disturbance in gait. In a second case all the symptoms subsided during a course of röntgen ray treatment, but Muskens warns that spontaneous remission with these tumors is not uncommon. However, the subsidence of the deafness, choked disc, atrophy of muscles and neuralgia in the face is certainly gratifying, but time alone will tell whether it is permanent. Agonizing trigeminal neuralgia had been the predominant symptom in one young man, but the incipient choked disk finally discovered (July, 1919), gave the clue to the tumor, and a scrap excised from an enlarged gland in the neck showed scanty karyokinesis. Three series of exposures were given, first by the nose, cheek, masseter and temple, with very hard rays, to the erythema dose, 30 H units; 190,000 voltage; filter, 0.5 mm. zinc. The second series, a month later, from the right and left sides of the neck; 20 H units. This was repeated a month later and, finally, after a two month interval, exposures exclusively on the left side of the neck where there had been some enlarged glands. The success surpassed the highest anticipations. Muskens reviews the history and literature on cerebellopontile tumore, saying of them, "In the last ten or fifteen years a silent drama has been acted before our eyes, or rather a deadly earnest game, where the stake is human lives and the counters are lost reputations of neurologists and surgeons."

Marinesco, G. LETHARGIC ENCEPHALITIS. [Bulletin de l'Académie de médecine, March 16, 1920.]

The more recent epidemic of this affection appears to include a considerable number of mild and atypical cases, in particular the ambulatory, myoclonic and meningeal forms, which were not seen in previous epidemics. He reports a case in a woman aged twenty-two, with pronounced lethargic and cataleptic symptoms but with preservation of the functions of the sensorium. The spinal fluid at first showed a marked lymphocytosis and the temperature eventually rose above 41° C. The patient died twenty days after the onset. Postmortem examination showed as the chief pathological disturbance an inflammation of the small and precapillary veins, the lymphatic sheaths of which were infiltrated with numerous lymphocytes, mononuclears, plasma cells and fibroblasts. Where destruction of medullated fibers or hemorrhagic foci occurred, macrophages laden with fat or pigment were seen. New formation of capillary vessels was likewise detected. Disseminated foci of hemorrhage were found in the gray substance of the floor of the fourth ventricle and of the aqueduct of Sylvius. No corresponding inflammation of the arteries could be found. The infundibulum was but slightly involved and the hypophysis not at all. The pathological changes were

not limited to the corpora quadrigemina and cerebral peduncles, but had extended to the thalamus and metathalamus, the telencephalon, the corpus striatum, and even the cerebral cortex. In the medulla, pons and peduncle there was marked infiltration of the vessels of the raphe. The raphe and even the nerve roots of the hypoglossal, glossopharyngeal, and pneumogastric showed foci containing not only mononuclear lymphocytes and plasma cells but also, and chiefly, enlarged and proliferated neuroglia cells of the fibrous type. Inflammation of the neuroglia about the blood vessels was manifest in all the cases of lethargic encephalitis examined postmortem by the author. Attention is called to the similarity of the pathological changes in lethargic encephalitis to those found in African sleeping sickness, general paralysis, and infantile paralysis. On the whole, no pathological peculiarity completely distinctive of lethargic encephalitis is as yet known. Neuroglia nodules have been found in the dentate nuclei, white matter, and other portions of the cerebellum by the author as well as by Charles Box. The pathogenic agent is asserted to be different from those of influenza and of infantile paralysis. It is probably propagated by the throat secretions. It is carried by the lymphatic vessels to the midbrain and medulla, where the most pronounced pathological changes are found.

Achard, C. SERPIGINOUS CHARACTER OF LETHARGIC ENCEPHALITIS. [Bulletin de l'Académie de médecine, April 6, 1920.]

The protean character of the clinical picture in lethargic encephalitis applies not only to different cases but likewise to the individual case, in which widely divergent clinical manifestations may follow one another in close succession. One patient had had the characteristic somnolence for one week before admission to a hospital. Upon admission he talked volubly, showed interest in his surroundings, moved without difficulty, and sat up in bed, but complained of left frontal headache. Next day the temperature rose to 39.2° C. and lumbar puncture yielded a hemorrhagic fluid which remained yellow upon centrifugation. Three days later fluid presenting these same features was withdrawn. The temperature remained above 38° C. for a week. Suddenly, after defervescence and marked diminution of the headache, complete paralysis of the left oculomotor nerve appeared. Had the initial disturbance not been known, independent diagnoses of meningeal hemorrhage and later of oculomotor paralysis, both of obscure origin, might have been made. The left pupil was dilated and unresponsive to light in this case. Reference is made to a similar case, with initial somnolence, reported by Achard and Paiseau in 1904, which was probably one of lethargic encephalitis. Stress is laid on successive stages marked by different clinical phenomena as a diagnostic feature in this disease. This variation of the symptoms may be correlated with present knowledge of the pathology of the disorder. The brain lesions, chiefly vascular in their

localization, may affect different nervous structures to a varying extent and for variable periods of time, passing from one point of the midbrain to another, and also to the cerebral hemispheres and spinal cord. The course followed by the lesions is serpiginous, and this is perhaps the most singular feature of the disease, for no other form of encephalitis, whether acute or chronic, presents it to such a high degree.

Jeanselme. CLINICAL SIGNS AND MENINGEAL REACTION IN LETHARGIC ENCEPHALITIS. [Bulletin de l'Académie de médecine, April 6, 1920.]

A case of lethargic encephalitis in which the initial soporose and paretic stage of the disease was followed by a stage of myoclonic movements and a third stage of choreiform manifestations and athetosis is reported. He discusses the question whether these later manifestations should be looked upon as sequelae or as the expression of a recrudescence of the encephalitis. Three lumbar punctures carried out at successive intervals of two weeks and one week proved highly significant in this connection. The first puncture showed thirteen lymphocytes and 1.5 grams of albumin; the second, three lymphocytes and 0.5 gram of albumin, and the third, twelve lymphocytes, 0.8 gram of albumin and 0.38 gram of sugar. Thus, during the soporose and paretic stage there was slight but distinct meningeal irritation. During the remission which preceded the manifestations of incoordination the meningeal reaction was perceptibly lessened. Finally, upon appearance of the myoclonia and chorea, a recrudescence of the meningeal reaction took place. In view of the close agreement between the clinical symptoms and these puncture findings, the myoclonia and chorea need not be considered as sequelae appearing during convalescence but as a new stage in the active course of the disease, doubtless associated with migration of the pathogenic agent to different structures.

Dopter, C. INCREASED CEREBROSPINAL SUGAR CONTENT IN EPIDEMIC ENCEPHALITIS. [Bulletin de l'Académie de médecine, March 2, 1920.]

A man, aged twenty-five years, complained of slight frontal headache and general lassitude, dull pain in the right scapular and cervical regions, diplopia, accommodative asthenopia, slight external strabismus, hydriasis, paresis of the lips on one side, doubtful Kernig sign, and slight fever. Ten months before, this patient had had a chancre and had been treated with novarsenobenzol; hence a tentative diagnosis of syphilitic meningitis was made, though the Bordet-Wassermann test was negative. The cerebrospinal fluid was clear and contained twelve lymphocytes per cubic millimeter and some albumin. Sugar, however, was found present in the unusual amount of 0.85 gram per liter. This findings was taken to exclude both syphilitic and tuberculous meningitis, and lethargic encephalitis was suspected. Next day the patient showed marked restlessness and delirium, followed by myoclonic twitchings and somnolence;

death took place a week later. From previous personal cases and the present case, as well as from the observations of other clinicians, Dopter concludes that increase of sugar in the cerebrospinal fluid is of value in differentiating lethargic encephalitis from meningitis in its various forms. This increase doubtless results from hyperglycemia, due in turn to disturbance of the floor of the fourth ventricle. In tuberculous meningitis sugar in the cerebrospinal fluid is diminished or entirely absent, while in syphilitic meningitis it is generally normal in amount and only exceptionally in excess. It should be borne in mind that increased sugar content may occur also in affections other than epidemic encephalitis, *c.g.*, diabetes, uremia, pneumonia, Malta fever, rabies, pertussis, brain tumor, amyotrophic lateral sclerosis, cerebral hemorrhage, and occasionally in chronic nervous syphilis. Furthermore, the sign is not constant in epidemic encephalitis. In one case examined late in the course of the disease, the sugar content was subnormal. Possibly in cases of encephalitis high up, without involvements of the bulbopontine region, excess of sugar is not to be expected.

Pic, A. LETHARGIC ENCEPHALITIS. [Lyon médical, March 25, 1920.]

A case of epidemic encephalitis unattended with somnolence is reported. The term lethargic encephalitis might with advantage be replaced by acute epidemic superior poliomyelitis, at least in some cases. By way of prophylaxis, antiseptics of the mouth and pharynx of patients and convalescents, as well as among the contacts and ordinary influenza cases, as indicated, the pathogenic agent apparently entering through the nasopharynx and persisting there. In the treatment, lumbar puncture may be of service in a few cases with meningeal reaction, and hexamethylenamine is also useful. To stimulate the leucocytes, colloidal metals and the fixation abscess are available, as are also subcutaneous injections of oxygen for detoxicatory purposes. Warm baths or the hot pack, together with an icebag to the head, may be used for sleeplessness, nerve pains, restlessness, and meningitic symptoms. Adrenalin is useful for heart weakness and low blood pressure, as in ordinary influenza. For insufficient diuresis, rectal injections of isotonic glucose solution by the Murphy method may be employed. By such means the mortality—so far reported as twenty-five to thirty-five percent.—may be lowered.

Levaditi, C., and Harvier, P. EXPERIMENTAL RESEARCH ON THE VIRUS OF LETHARGIC ENCEPHALITIS. [Bulletin de l'Académie de médecine, April 20, 1920.]

The authors note that on February 10, 1920, they were successful for the first time in inoculating a rabbit with the disease, using an emulsion of brain tissue from a case of encephalitis in a woman aged forty-five. The tissue was obtained aseptically from the cortex, midbrain and medulla, and was inoculated in the dose of 0.2 mil into the brains of two

rabbits and one monkey. One of the rabbits died on the eighth day. Cultures of the brain and cardiac blood were sterile, and the nerve centers showed the typical lesions of meningoencephalitis of the cortex and midbrain. The two other animals showed no disturbance whatever. An emulsion of brain tissue from the dead rabbit was inoculated in the same dose into two other rabbits, which died on the sixth and seventh days, respectively, and showed identical brain lesions. The virus from one of these rabbits was subsequently passed through a number of other animals in succession. The experiments showed that the incubation period of the disease after intracerebral inoculation averages four or five days. Symptoms appear only a few hours before death and consist of a torpid condition with signs of meningeal irritation and epileptoid and myoclonic spasms in the limbs or choreic movements. The virus can be preserved in glycerin, and is a filterable virus, readily passing through the Chamberland filters Nos. 1 and 3. The virus may be inoculated into the rabbit through the sciatic nerve as well as through the anterior chamber of the eye. The virus does not seem to be pathogenic for monkeys when directly obtained from man, but becomes so after having passed a certain number of times through rabbits. It then becomes pathogenic likewise for guinea pigs. The virus retains its virulence after desiccation in vacuo in the presence of sulphuric acid and after desiccation in a watch glass in contact with caustic potash. The virus is present in the spinal cord of animals inoculated by the cerebral route. The serum of patients convalescent one month from lethargic and myoclonic encephalitis has no neutralizing action upon the virus. Experiments upon crossed immunity with the virus of poliomyelitis, upon vaccination of animals, and upon serum treatment are now being carried out.

Litvak, A. THE OCULOCARDIAC REFLEX IN LETHARGIC ENCEPHALITIS. [Presse médicale, February 14, 1920.]

In lethargic encephalitis the oculocardiac reflex is rather active. The more deeply somnolent the patient, the more readily the reflex is elicited. In syphilitic meningitis, this reflex is always absent, while in tuberculous meningitis it is only uncommonly present and is feeble. In lethargic encephalitis there may be observed a condition of dissociation between the tone of the circulatory center, which may be lowered, and the oculocardiac reflex, which may be rather pronounced.

Jeanselme, E. SYPHILIS AND LETHARGIC ENCEPHALITIS. [Bulletin de l'Académie de médecine, March 2, 1920.]

Lethargic encephalitis may readily be overlooked in cases of suspected syphilis of the central nervous system. Many symptoms are common to both disorders, from dissociated paralysis of the cranial nerves and the Argyll-Robertson pupil to convulsive seizures and apoplectic coma. The author's case was characterized by persistent somnolence

from which the patient could readily be roused, complete mental clearness, and a diffuse parietic condition with motor incoordination reflecting cerebellar involvement. The tendon reflexes were markedly disturbed, ankle clonus was present, and bulbar involvement was shown by tachycardia, dissociation of the pulse and temperature, and polypnea on slight exertion. Lumbar puncture at first showed 1.5 grams of albumin per liter, positive Bordet-Wassermann, and thirteen lymphocytes per cubic millimeter. Sixteen days later the lymphocytes had dropped to three and the albumin nearly to normal, and the Wassermann was negative. The blood Wassermann had been negative on two occasions. The initial positive cerebrospinal Wassermann is thought to have been due to the hyperalbuminosis. A positive reaction has already been occasionally noted in nonsyphilitic persons in the presence of marked hyperalbuminosis and xanthochromia of the cerebrospinal fluid.

Claude, Henri. LATE SEQUELAE OF LETHARGIC ENCEPHALITIS. [Bulletin de l'Académie de médecine, March 2, 1920.]

Four cases illustrating the fact that encephalitis patients may continue for a long period after apparent recovery to be troubled with asthenia, inability to work, and the recurrence upon fatigue of particular symptoms, such as motor paresis, choreiform movements and visual disturbances are reported. Altered disposition may also persist for some time. These sequelae are explainable on the basis of the vascular and perivascular pathological changes found in cases studied postmortem.

Chalier, J. PROGNOSIS AND TREATMENT OF EPIDEMIC ENCEPHALITIS. [Presse médicale, April 25, 1920.]

The mortality rate of lethargic encephalitis is estimated as forty to fifty percent. Rise of the temperature to 40° C. is an unfavorable prognostic feature, as are also tachycardia—with or without fever—and polypnea, which suggest bulbar involvement. Cases manifesting excitement are more dangerous than those exhibiting somnolence alone. An unfavorable meaning attaches to the dissemination and progression of certain symptoms, such as myoclonic movements, particularly with participation of the diaphragm, and more or less diffuse choreic manifestations. Regarding treatment, Chalier considers the administration of serum from convalescents the most rational measure. In a recent severe case its use was followed by recovery.

Bond, Earl D. EPIDEMIC ENCEPHALITIS AND CATATONIC SYMPTOMS. [American Journal of Insanity, January, 1920.]

In a review of three cases Bond found that mild and transient, but definite, symptoms are usually missed in excited, seclusive or indifferent patients. In one, strabismus went unrecognized at home; another, be-

cause she had no psychosis, was able to give information which would have been lost in a person less clear. Some facts came out in retrospective accounts which few can give satisfactorily. The author has elsewhere emphasized that fevers are usually overlooked in difficult and chronic patients. There is a great reward for the first hospital for mental disease which can carry out good, thorough and repeated physical examinations on all its patients. A catatonic episode in a chronic mental patient demands and rewards the same skillful medical and nursing care which is given to the general hospital patient with acute encephalitis.

Haag, M. D. LETHARGIC ENCEPHALITIS IN PREGNANT WOMAN. [Mich. St. Med. Soc. JI., November, 1920.]

This patient was pregnant seven and one half months. At no time any signs of abortion appeared, although the temperature was as high as 104° F. The fetus remained alive until the day the patient died. Ten other cases complicating pregnancy are reported upon.

Burrows, M. T. NEURITIS OF CRANIAL NERVES IN LETHARGIC ENCEPHALITIS. [Jl. Infect. Dis., October, 1920.]

Three cases present the clinical and pathological picture that is now known as diagnostic of "encephalitis lethargica." The lesions noted in the central nervous system in these cases are those of an acute inflammation which in its histology is not different in many of its characters from that which is known to occur in acute poliomyelitis.

Glancy, J. A. R. BOTULISM IN THE YUKON. [Canadian Med. Ass. JI., November, 1920.]

Glancy describes in detail the symptoms he noted when afflicted with botulism, analyzes twelve fatal cases and the histories of seven patients who recovered. The length of time before symptoms manifested themselves varied from twenty-six hours to five days—those who died being from twenty-six to thirty hours, which was the time in the majority of all cases, and those who lived being from twenty-six to seventy-two hours—with one exception which was five days. It was the right side throughout which was affected to the greater extent in almost every case. The forearms were affected most often—the left in a general way—the right in distinct muscle groups—the weakness of the extensors of the forearm and hand being common to almost every case. There were no griping pains in the abdomen, and vomiting and diarrhea were not common symptoms. There was little deviation from normal in temperature or pulse rate, except when the patient was approaching death—and then only immediately before death. Somewhat regular irregularity as to good and bad periods—particularly during the convalescent period—was common to all. Both the intrinsic and extrinsic eye muscles were

affected in practically every case. Every man (including those who died) had perfect control of mentality at all times. Headache was usually occipital; if parietal, it was usually left sided. Of those who survived, the author's was the only case in which there was extreme difficulty in breathing, and where the feeling of suffocation was so extreme for so long a period—also where there was intense pain over the aortic and pulmonary areas at the base of the heart. [J. A. M. A.]

Scheel. DIAGNOSIS OF LETHARGIC ENCEPHALITIS. [Ugeskr. for Laeger. July 15, 1920.]

Eight cases of lethargic encephalitis are reported on and discussed. The extraordinarily polymorphous character of this disease impressed the author. There must be many cases of "encephalitis ambulatória." The patient is drowsy and disinclined for work, but he does not feel ill enough to go to bed, and the true character of the disease is overlooked. Referring to the monosymptomatic forms of the disease, late in Denmark several persons have complained of hiccough, lasting for one or more days. As for the pareses, their predilection for the muscles of the face and eyes is very suggestive of epidemic encephalitis; but one arm or leg may also be affected. The transitory character of these pareses is also of diagnostic importance, and in one of the author's cases complete paresis of one arm disappeared in the course of a few days. Vesical paresis appears to be a common symptom, but it seldom lasts long enough to necessitate the use of a catheter. When the onset of the disease is insidious, lethargy and pareses often supervene, whereas a sudden onset is commonly followed by myoclonia and pain.

Knox, J. H. M. TUBERCLE IN MIDBRAIN. [Am. Jl. Dis. Children, November, 1920. J. A. M. A.]

Knox's patient was a colored boy, 3 years of age, who manifested general weakness and trembling and drooping of the eyelids. Röntgenoscopy of the head showed a moderate internal hydrocephalus and a probable tumor above the sella turcica. At the necropsy dissection of the brain stem disclosed a large tubercle the size of a hickory nut which took the place of the upper surface of the midbrain. The anatomic diagnosis was solitary tubercle of the midbrain and right parietal lobe; tuberculous meningitis.

Paulus, A. CONCERNING TUMORS OF THE MIDBRAIN. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. 45, p. 162.]

For the topical diagnosis of tumors in the midbrain there are, according to Marburg, three clinical symptom complexes corresponding to the three anatomical levels. The paralysis of the oculomotorius combined with disturbances of motility in the extremities is common to all three

levels, but the syndrome of Benedict (paralysis of the oculomotorius with contralateral athetosis or tremor) indicates a lesion in the tegmentum region. The Weber symptom complex (homolateral paralysis of the oculomotorius with contralateral hemiplegia) is characteristic for a process in the region of the cerebral peduncle. Nothnagel's syndrome finally (unilateral or bilateral oculomotorius paralysis with ataxia of the cerebellar type) indicates a process in the region of the corpora quadrigemina. For the tumors of the ventral portion of the crus cerebri, however, the author states, Weber's syndrome is only in a general way indicative of the localization, and a considerable tumor may exist in this region without conditioning a very decided Weber syndrome, for the tumor may be situated in such a way as not to involve the oculomotorius and in such cases the typical diagnosis is naturally difficult. This would be the case with a tumor in the lateral section. If the tumor is localized in the anterior lateral section there are often disturbances of the tractus opticus instead of disturbances of the oculomotorius. For the topical diagnosis within the cerebral peduncle, vasomotor and trophic disturbances are cited as indicative of the localization, but there is great uncertainty as to these symptoms. The author describes a case of tumor in the ventral portion of the crus cerebri in which the clinical picture deviated from the usual one to such a degree that a wrong diagnosis was made. The patient was seized in the field with symptoms of increased brain pressure—severe headache, extreme apathy, reaching a stuporous condition, dysarthric and bradyphasic disturbances of speech, difficulty in swallowing, paresis of the right facialis in all three branches, and finally spastic parietic phenomena in the right extremities. These clinical phenomena were considered to indicate a tumor in the upper part of the pons before the crossing of the facialis. The section, however, revealed a tumor in the ventral portion of the crus cerebri. A remarkable circumstance in this case is that, notwithstanding the size of tumor in this region (it was as large as a walnut), it did not give rise to Weber's syndrome and the oculomotorius was entirely free. The only cardinal symptom indicating peduncular involvement was the spastic hemiparesis; the centrally conditioned facialis paralysis gave very slight indication of the exact localization and the diagnosis made was wholly in keeping with the clinical facts. D'Astros is of the opinion that the dysarthric speech disturbances indicate peduncular lesions, the so-called scanning speech point to lesions in the tegmentum. Marburg, on the contrary, considers all disturbances of speech as due to brain pressure, and, therefore, as general symptoms. The author's case shows that this view does not hold for all instances, as the speech disturbances in his patient were present at the very beginning of the disease and preceded the general symptoms by several weeks, indicating that the speech disturbances may have value for the topical diagnosis.

Mendes, R. Texeira. THALAMIC SYNDROME WITH CEREBRAL ARTERIO-SCLEROSIS. [Brazil-Medico, May 22, 1920.]

Following the leads of Roussy and other observers of this general syndrome the author separates three types: the pure thalamic syndrome, the mixed thalamic syndrome and the thalamic status. He then describes a case of the latter type in which arteriosclerosis was evidently a factor. The first symptom fifteen years before had been sensations of heat in the hands, compelling the woman to bathe her hands frequently in cold water. Then came great debility and inability to lift or even grasp objects, with other symptoms of thalamus derangement.

Briand, M., and Rouquier, A. INORGANIC MOTOR DISTURBANCES. [Presse méd., July 14, 1920.]

These authors report a number of puzzling motor disturbances which at first sight seemed to resemble hysterical symptoms but which on closer analysis might better be referred to residual signs of a mild attack of lethargic encephalitis.

Hunt, J. Ramsay. THE STATIC AND KINETIC SYSTEMS OF MOTILITY. [Tr. Am. Neurol. Soc., 1920.]

According to the author, motility consists of two components, each represented throughout the entire efferent nervous system by separate neural mechanisms. This is true not only of the segmental nervous system but also of the larger integrating and coordinating masses of the brain and cerebellum. These two systems are mutually cooperative and yet physiologically and anatomically distinct. Under normal conditions they are inseparable and act in unison, and the harmony of their relation is only disturbed by the dissociations of accident or disease. One of these components of motility is the movement proper, which is subserved by the *kinetic system*.

The other represents the more passive form of contractility, which we recognize in tonus, posture, attitude and equilibrium. This static function of the efferent system is subserved by separate neuromuscular pathways, which may be termed the *static system*.

Comparative anatomy shows clearly that the muscular system, like all other structures of the body is in a state of evolution, adapting itself to the changing conditions of the organism. Development is from the slow movement of the unstriated to the quick movement of the striated muscle fiber. And in man, all gradations may be observed from the lowest type of unstriated muscle to the highest type of the striated muscle fiber. Striated muscle contains two substances, both capable of contraction. The one is the *disc mechanism* of the muscle fiber, which gives rise to the quick movement or the twitch. The other is the *sarcoplasm*, which yields a more plastic form of contraction. A clear conception of

the phylogeny of contractile tissue is important to the author's theory as he does not regard the skeletal muscle mass in man as a mere aggregation of muscle fibers of a standard type, but rather as systems of end organs representing different stages of phylogenetic development, and thus corresponding in some measure to similar differentiation in nerve tissue.

Motility in animal life is usually divided into three groups: (1) reflex, (2) automatic and associated, and (3) isolated synergic movements. It should be remarked, however, that one group merges imperceptibly into the other and the transition is so gradual that it is difficult to say where one type cases and the other begins. All of these movements, reflex as well as automatic, have their corresponding static components, and every cessation of movement is immediately followed by fixation of the contraction in posture. In the higher mammals and especially in man one encounters a new for mof movement which differs from reflex and automatic movements in the quality of individuality and dissociation. In all of these isolated forms of voluntary movement there is also the element of posture, and it may be stated without fear of contradiction that there is no form of motility from the simple reflex to the most skilled and individualistic type of movement which functions without a corresponding static mechanism. In a general way the *central nervous system* may be said to represent three great structural and functional divisions.

(1) A *segmental nervous system*, which contains the great reflex systems of the neuraxis.

(2) A paleoencephalon, which represent the essential sensory and motor mechanism in lower forms.

(3) A neoencephalon, which has its greatest development in man, and subserves the highest functions of motility and sensibility.

Hunt believes that these three great functional divisions of the nervous system are related to the three great types of movement and posture enumerated above.

In this conception he regards the *cerebellum* as the great correlating center for the *static functions* of motility, in contrast to the corpus striatum and Rolandic area, which he regards as the essential correlating centers for the control of their respective forms of kinetic function. Furthermore, he believes that these systems are represented by special end organs in the skeletal muscles in the same manner as we conceive sensations with their special systems and modes of termination.

The *skeletal musculature* is composed of striated muscle held together by connective tissue, by means of which the contractile mass performs its functions. As we have seen each striated muscle fiber is composed of two distinct substances which are now generally recognized by physiologists as subserving different types of motor function. In a general way it is estimated that the *disc system* constitutes about $\frac{1}{6}$ to $\frac{1}{4}$ of the total muscle mass, the remaining portion of which is *sarcoplasm*.

Each muscle fiber contains a motor nerve ending, which is the terminal of a medullated nerve fiber. For many years this was thought to be the sole innervation of the muscle fiber, until Perroncito and Bolke demonstrated the existence of another smaller nerve ending in the striated muscle fiber which was shown to be the terminal of a nonmedullated nerve. The existence of two separate contractile systems in striated muscle fibers is also shown very clearly by the electromyogram. In myotonia congenita the presence of two distinct contraction waves may be demonstrated, the one quick and referable to the disc system, the other slower, more sustained, and of sarcoplasmic origin. In the author's theory of a dual efferent system the discs are to be regarded as the end organ of the kinetic system and the sarcoplasm as the end organ of the static system, just as we conceive the heat and cold spots or the tactile corpuscles as end organs in their respective sensory spheres. These end organs of the skin have undergone special differentiation on certain parts, and have thus acquired a greater accuracy and refinement of function. He believes that a similar specialization of function and structure exists in the skeletal muscles. By this he would emphasize what perhaps is not generally recognized, that the muscle fiber system, like the nerve fiber system, participates in phyletic differentiation, and that those muscle fibers which subservise the higher functions of neokinesis are more highly specialized than are those which are concerned with paleokinetic function.

According to this conception the corticospinal system (pyramidal tracts) and the striospinal system (extra pyramidal tracts) would both be represented by their respective contractile end organs. As the striospinal system is older the muscle fibers subserving this function would be less highly differentiated than those subserving the highest cortical function. This theory is confirmed by the existence of two kinds of fibers in skeletal muscles. The *pale* fibers which are rich in contractile substances and contain comparatively little sarcoplasm. The *dark* fibers which are rich in sarcoplasm with a relatively simple disc mechanism. Both kinds of fibers are found in all muscles in varying degrees. The pale fibers are the quick contracting and the dark fibers the slow contracting fibers of the physiologists. And the quickness of a muscle contraction which varies considerably in different portions of the body depends upon the relative number and distribution of these two types of fibers.

The segmental nervous system in its relation to a dual function of motility. Sherrington has reached the conclusion that two types of reflex action may be recognized. There is a reflex movement which he calls the phasic reflex, and a reflex posture which he terms the tonic or postural reflex, and in the realm of reflex action he indicates the duality of function which the author would extend to the whole of the efferent system. Reflex action is therefore dependent upon a peripheral kinetic

system which terminates in the disc contractile mechanism. And reflex posture is dependent upon a peripheral static system which terminates in the sarcoplasm of the muscle fiber. These are the neuromuscular representatives at the segmental level of the kinetic and static pathways of motility.

The central pathways of motility. The Kinetic System: In a previous study of paralysis agitans the author expressed himself as favoring the conception of two great motor systems from brain to muscle, one subserving paleokinetic and the other a neokinetic function. The corpus striatum, according to this view, is the kinetic center for the control of "automatic and associated movements," and the Rolandic area the kinetic center for "dissociated movements" of cortical origin. Their static functions he believes are subserved by other pathways. In striking contrast to the paleokinetic system is the neokinetic system. This is a direct pathway from brain to muscle for the control of isolated synergic movement. It takes its origin in the motor cells of the Rolandic area and passes by way of the pyramidal system directly to the spinal cord (pyramidal tracts), and from there to a special disc representation in muscle subserving the dissociated movement of cortical origin.

These two great motor systems, the *pyramidal* and *extrapyramidal*, are, according to this theory, both represented in nerves and skeletal muscles, but in different degrees.

The *central pathways* for the control of the *static component* of motility are, he believes, distinct from those subserving a kinetic function.

The essential suprasegmental mechanism for the control of static motility he holds to be the cerebellum. Anatomically the cerebellum has close connections with both the cerebrum and the spinal cord. The efferent cerebellar system originates in its central nuclei and passes in the superior peduncles to the rubrospinal system. In the cerebellum there are phylogenetic evidences of two great systems, which correspond to similar divisions of the encephalon. There is a paleocerebellum, or Vermian system, and a neocerebellum, or hemispheric system.

The older cerebellum stands in relation to the *paleostatic system*, which controls the static functions of movement of the "automatic and associated type." The cerebellar hemispheres, on the other hand, control the higher postural functions and represent a *neostatic mechanism*. This is controlled from the central cortex by a special system of fibers passing from the frontal lobe to the pons varolii and from thence to the opposite hemisphere of the cerebellum. The frontopontine system descends in the internal capsule and cerebral peduncle in close association with the pyramidal tracts and it is interesting to note that both structures receive their myelin sheaths subsequent to birth.

The *paleostatic system* originates in the older nuclei of the vermis cerebelli, and the *neostatic system* is an outgrowth of the dentate nucleus. They then pass in separate divisions of the rubrospinal systems to the

sarcoplasm of the skeletal muscles. (A paleo-rubro-spinal system and a neo-rubro-spinal system.)

Relation of the Dual Systems of Motility to Symptomatology.—In general it may be stated that a lesion of the kinetic system causes a disorder of movement and a lesion of the static system a disorder of tonus, or the posturing mechanism. In many of the disturbances of motility both systems participate, although it is usually possible to indicate one or the other as the essential factor. At the segmental level of the nervous system the tendon reflex is a typical example of kinetic function, as is the muscle tonus of static function. These two components may also be recognized on direct percussion of the muscle, by the quick contractions of myotatic irritability and the more persistent local reactions of the idiomuscular response. Such disorders of motility as paramyoclonus multiplex, myokymia and fibrillary twitchings are irritative phenomena in the kinetic spinal mechanism. The clonus of spastic paralysis and the tremor of paralysis agitans are both of kinetic origin. One is related to the neokinetic and the other to the paleokinetic system. The more plastic tonicidity which is also present in both of these forms of palsy is of sarcoplasmic origin, and referable to the static system. Huntington's chorea and epilepsy are both of kinetic origin, the former is referable to the striatal and the latter to the cortical level of motility. Rarely in epilepsy there are attacks which suggest a relation to the static system. These are characterized by a sudden loss of postural control without convulsive manifestations (static seizures; static epilepsy). Other disorders of motility, referable to the corpus striatum, such as athetosis, dystonia, progressive lenticular degeneration and paralysis agitans represent different degrees of involvement of its efferent and inhibitory systems. This phase of the subject has been considered in detail in the author's contributions to the symptomatology of the corpus striatum. (Brain, 1917, p. 58.) All forms of myotonia, cerebral, cerebellar, spinal and peripheral, would appear to be of sarcoplasmic origin and referable to the static system. There is also much in favor of the hypothesis that tonic spasms of cerebellar origin and the tonic rigidity of tetanus are contractile manifestations of sarcoplasm. The nature of the Bárány reactions to labyrinthine stimulation would also indicate a very definite relationship to the static system and the sarcoplasm; *e.g.*, the *slow* component of the nystagmus is the direct response of the static system to labyrinthine stimulation, the quick response representing a compensatory reaction on the part of the kinetic system. One organic symptom in particular is closely related to the static function of the cerebellum, *viz.*, the *intention tremor*. The intention or cerebellar tremor presents the characteristics of a loss of the static component of motility. The coarse tremor movements may be regarded as effort of the kinetic system to compensate for the loss of the posturing or static functions of sarcoplasm. In addition to these various somatic expressions of kinetic

and static function, a similar division may be recognized in the mental sphere. Among these may be mentioned catalepsy, catatonia and certain of the hyperkineses of psychic origin. A *psychostatic* and *psychokinetic* representation may therefore be postulated at the psychic level of motility. [Author's abstract.]

Lhermitte, J., Cornil, L., and Quesnel. THE SYNDROME OF PROGRESSIVE DEGENERATION OF THE PYRAMIDAL TRACTS AND THE PALLIUM. [Revue Neurologique, March, 1920 (Soc. Neur. et Psych., Paris, Seance, March 4, 1920).]

Report of a case, without autopsy, in a patient, aged 53, in which there was a gradually developing contraction and rigidity in all four extremities, marked difficulty in speech, etc., which symptoms were attributed to progressive degeneration of the pyramidal tracts (as in amyotrophic lateral sclerosis) with involvement of the globus pallidus. [Camp.]

Westphal, A. CONCERNING BILATERAL ATHETOSIS AND ALLIED PATHOLOGICAL CONDITIONS (STRIATE SYNDROME). A contribution to the study of diseases of the lenticular nucleus. [Archiv. f. Psychiat. u. Nervenk., 1919, Vol. 60, p. 361.]

There is still no complete understanding of the connection between the clinical picture and the anatomico-pathological findings in diseases of this nature. The author therefore publishes three cases which were remarkable in many respects and illustrated different forms of disturbances of motility due to affections of the corpus striatum. The clinical symptoms of the first case were athetotic affections of the muscles of the extremities on both sides, of the trunk, and of the face. The involvement of the face was very pronounced, taking the form of a nearly constant grimace. In the extremities it was not the distal parts, as usually, which were affected, but the proximal, and the spasms did not possess the rhythmic character mentioned by Lewandowsky, but occurred, for the most part, in irregular and constantly changing manner. The peculiar influencing of the movements by psychical emotions was noticeable; they ceased when the patient was spoken to, or his attention was engaged. The characteristic poverty of motion was pronounced, there were disturbances of speech and swallowing, as well as disturbances of the bladder of the character which led v. Czylarz and Marburg to assume a bladder center in the corpus striatum. The author emphasizes the resemblance which the disease picture presented to paralysis agitans, on the one hand, and to dystonia musculorum deformans on the other, and calls attention especially to the symptom of retropulsion which he has never seen mentioned in bilateral athetosis though it cannot be considered as pathognomic for paralysis agitans, as it occurs in other amyotatic symptom complexes. The resemblance to dystonia musculorum

deformans (torsion spasms) was marked. Whether there is a sharp distinction between dystonia musculorum deformans and athetosis recognizable in the clinical pictures is a problem for future solution. The author decided his case belonged to the latter category because the patient was an adult, was not of Jewish extraction, and because the disease began in an acute manner. The anatomical findings were bilateral symmetrical disease processes of the lenticular nucleus. The anterior external part of the putamen showed on both sides a honeycombed structure about the size of ten cent piece. The outer boundaries of the diseased region were sharply determined by the external capsules. These findings were essentially similar to those described by C. Vogt, Oppenheim, O. Vogt, Freund and Barré in cases which presented the clinical picture of bilateral athetosis. The second case resembled the symptom picture of paralysis agitans, and in the autopsy it could not be definitely decided whether a bilateral disease of the lenticular nucleus or a severe degeneration on only one side was at the foundation of the disturbance. In regard to the etiology, the relation to syphilis was of special interest as there was evidence that in both cases the disturbance was due to disease of the central nervous system standing in connection therewith. Experience indicates that causes of the most different character may produce disease of the lenticular nucleus. The third case is still under the author's observation. It resembles closely Strümpell's amyostatic symptom complex and illustrates also the close relation between athetosis and dystonia musculorum deformans. [J.]

Rümke, H. C. EXTRAPYRAMIDAL MOTOR DISTURBANCES. [Nederl. Tijdschr. v. Geneesk., September 11, 1920. J. A. M. A.]

Rümke is assistant at the clinic for nervous and mental disease at Amsterdam, and his discussion of the literature and his own experience on this subject show that conflicting opinions prevail. The only point on which all seem to agree is that the corpus striatum is an important factor. Some rank the striatum with the cortex in this respect. A wide field for research has been opened here, and the clinic must record the sequence of the phenomena with shaking palsy, chronic chorea, double athetosis, etc. It must be learned whether the motor disturbances can occur without stiffness of muscles, what the relations are between chorea, athetosis and rigidity of the muscles, and what part the tonic element plays here. It must also be ascertained in what cases disease of the thalamus induces rigidity of muscle. As Hunt has suggested, the output of creatinin in these diseases must be measured, which so far has not been done, to Rümke's knowledge. Experimental research with minute lesions in the tract, to estimate striatum functioning, may also prove instructive. It may be possible to test different parts of the nucleus ruber to confirm Kleist's and Wilson's theoretical assumptions. Above all, we must learn more in regard to the relations between the striatum and its environment.

Tilney, F. FUNCTIONAL SIGNIFICANCE OF CEREBELLUM. [*Neur. Bull.*, August, 1919.]

The first part of this extensive paper consists of a general consideration of the evolutionary significance of the cerebellum. In part two the functions of the cerebellum are discussed, the product of those workers, experimental and clinical, on the localization of function in the cerebellum being given a prominent place. Lastly, the cerebellum syndrome, based on the examination of a very interesting case, is set forth as follows: (1) *Asynergia* as manifested in the pendulous knee jerk; the *asynergia major*, which gives rise to the staggering gait, caused by dissociation of synergic units of the trunk and extremities and the decomposition of synergic movements; the incoordination of station due to the same causes; the *asynergia minor*, shown in the pass-pointing, finger-to-finger and finger-to-nose tests; the *dysmetria*, or improper measuring of extent, rate and force of volitional movements; the *adiadokokinesis*, or failure to produce succession movements (pronation and supination of the forearm); the rebound phenomenon of Holmes; the tremor on voluntary movements, which consists of irregular oscillations of the arms, legs and head; the irregular persistent nystagmus and the *asynergic* speech disturbance, resulting in scanning, slurring and explosive articulation. (2) The absence of pronounced changes in the deep and superficial reflexes and in the tone of the muscles. (3) The absence of paralysis or actual loss of strength. (4) The absence of changes in general or special sensibility. (5) The absence of visceral disorders. In brief, the symptoms of intrinsic cerebellar disease are confined exclusively to disturbances of the motor sphere and affect only the equilibratory and nonequilibratory synergic control of the muscles. [*Aust. Med. Jl.*]

Pol, D. J. Hulshoff. OUR EQUILIBRIUM-ORGAN. [*Proc. Koninkl. Akad. v. Wetenschappen te Amsterdam*, 1919, XXI, 626.]

When an ataxic tabetic, whose cervical cord is not involved, has by means of his hands nerve contact-sensation with the hands of persons walking on his right and his left side, his ataxia almost entirely disappears. Pol explains this by the fact that, as long as the disease resides in the lower part of the spinal cord, he is enabled to make use of the equilibrium-sensation of his upper limbs (afferent-proprioceptive stimuli), and in this way he can orient himself better in space. In this experiment the patient's soles are blackened, and he attempts to walk on a line drawn on large pieces of paper; the assistants are asked not to support him, but to give way as it were in vertical direction to the movements which the patient makes. In the same way, in vestibular affections the equilibrium-sensation of the arms can entirely or very largely replace the proprioceptive impulses from the vestibular organ. Pol concludes that our sixth sense (the equilibrium-sense) has to be looked for not only in the vestibular organ, but is spread over the whole

of our body; the vestibular organ is but a part of it. And the various parts of this equilibrium-sense can compensate one another reciprocally. [Leonard J. Kidd, London, England.]

Griffith, J. P. C. ACUTE CEREBROCEREBELLAR ATAXIA. [Am. Jl. Dis. of Children, August, 1920. J. A. M. A.]

Four cases are reported by Griffith to emphasize that there is a condition not common, but still certainly more frequent than ordinarily supposed, in which an acute hemorrhagic encephalitis involves the cerebellum, and which could be designated "acute cerebellar encephalitis." With this are always combined symptoms indicating an involvement of the large brain as well, and the title "cerebrocerebellar encephalitis," or "cerebrocerebello-bulbar encephalitis," is consequently to be preferred. The degree to which the process involves one or another part of the brain varies with the case; in some instances the cerebellar lesions predominating, in others the cerebral; but in all in the category of cerebellar encephalitis there is, as stated, a combination of the symptoms affecting both regions. In very many more instances the cerebellum escapes entirely, so far as symptoms indicate; but to these no reference is made here. The cause of this cerebrocerebellar encephalitis varies decidedly. In the majority of the cases previously reported in medical literature, some infectious disease had preceded the attack. This was true of two of Griffith's cases, but no such connection could be discovered in the other two. Unconsciousness, ataxia, affection of speech, disturbance of mentality, nystagmus, "loss of power," and active tendon reflexes are the symptoms seen most often. Vertigo is conspicuous by its absence. The prognosis, as far as life is concerned, is good. Of the seventeen cases collected from medical literature in an earlier report, complete recovery is known to have taken place in a considerable number, and it is probable that this was true of a number more. So far as statistics go, it appears that the disease leaves no traces in the majority of instances.

Pol, D. J. Hulshoff. NECK-EQUILIBRIUM. [Psychiatrische en Neurologische Bladen, 1918 (3 figs.). (Feestbundel Winkler.)]

Pol here shows that in vestibular diseases, when the vestibular proprioceptive impulses for equilibration are lost, the neck-equilibrium paths can to a greater or less extent compensate for this junction, so that they then effect a double function, viz., they subserve the equilibrium of the neck itself, and in addition that of the head. A patient was admitted, after apparent recovery from cerebrospinal meningitis, complaining of difficulty in walking, especially in the dark, headache, vertigo, and poor hearing. Both labyrinths were almost entirely inexcitable, the right being somewhat the more affected; no other signs. The patient toed the line very well except that the three first steps deviated to the right; when he was blindfolded (after having previously well fixed the

line visually) he became very ataxic. When his neck was enveloped in a firm bandage so that his neck movements were greatly limited, he showed a very ataxic gait, even with his eyes open; in a normal man such a bandage does not impede the gait. These gait tests show that the sensory neck equilibrium paths have largely taken over the function of the sensory vestibular equilibrium paths. [Leonard J. Kidd, London, England.]

Pol, D. J. Hulshoff. CEREBELLAR ATAXIA AS DISTURBANCE OF THE EQUILIBRIUM-SENSATION. [Proc. Koninkl. Akad. v. Wetenschappen te Amsterdam, 1919, XXI, 636 (4 figs.).]

A sufferer from a vestibular affection walks by means of his eyes, the equilibrium-sensation of his trunk and legs, and the remnant of the equilibrium impulses obtained through his vestibular apparatus. When he has contact of his hands with those of two persons walking by his sides he is able to walk normally, or almost normally, just as an ataxic tabetic does when the tabes does not affect the arms. There should be no fundamental difference between the afferent proprioceptive stimuli which are conducted from the cerebellar tracts of the lateral column and those from the vestibular apparatus to the cerebellum; all these stimuli are related to the equilibrium-sensation and therefore regulate our gait. These different afferent tracts thus form a whole and they are to be considered as a subdivision of the same equilibrium system. In a case of left sided tumor cerebelli pressing on cerebellum and left nervus octavus—confirmed at operation and necropsy—the patient's ataxic gait became worse on shutting her eyes; when she walked with eyes open and with contact-sensation of her hands, then, although also the neck-equilibrium impulses were shut out by means of a bandage, her ataxia disappeared; the same thing happened when her eyes were shut. Pol concludes that ataxia appears when the vestibulo-cerebellar and the spino-cerebellar tracts are interrupted in the cerebellum; the type of the resulting cerebellar ataxy will vary according as these tracts suffer more or less, whether alone or together. [Leonard J. Kidd, London, England.]

Book Reviews

Southard, E. E. SHELL-SHOCK AND OTHER NEUROPSYCHIATRIC PROBLEMS. PRESENTED IN FIVE HUNDRED AND EIGHTY-NINE CASE HISTORIES FROM THE WAR LITERATURE. 1914-1918. Boston. W. M. Leonard, Publisher.

A monumental work from two points of view this thick volume of Southard may be called. It stands out in high relief among the many works long and short which have been prepared on the war neuroses because of the author's approach to the subject on the broadest and firmest lines. He presents its various facts clear cut out of his own acute study of cases passing under the observation of eminent war neuropsychiatrists of all countries, his understanding sharpened by his own experience with similar situations. But aside from these features brought together by the author's hand, or rather because these bear everywhere the impress of his skillful workmanship, the book is a personal monument commanding especial regard.

The fearless strokes of this hand we all knew; its finer touches testified to long practice inspired by unflagging interest in every detail of art and science that could contribute to his own professional activity. These have been freely requisitioned in the collection of material for the book. The sympathetic understanding with which the details have been selected and the stimulating way in which they have been brought together give evidence of this. That hand laid down its tools so soon after the appearance of the book that gratitude and reverence for its character are increased. It is not in this case that personal feeling serves to cover defect or to enhance a doubtful value. The situation is quite otherwise. Hence the profound feeling with which the members of the profession welcome this so comprehensive treatment of Shell-Shock. They must at the same time feel that the writer has thrown down many a constructive challenge to press on into the paths for future investigation which he has suggestively laid open.

An exhaustive treatise the work cannot be called from the nature of the matter treated. It is because the writer so well understood this that he has prepared so valuable a work. There is nothing dogmatic in the book. Preconceived ideas, temptation to individual definition are scouted by the interests of an inquiring mind bent upon assembling from the experience of all combating parties, from the observations of the keenest workers in the field, all the data which will illuminate the subject of Shell-shock. If any preconception is evident it is that broad one of a mind looking out from its own position only into wider areas where facts reveal ever more interrelations with other facts. Thus while they carry

the inquirer into continually broadening implications they also rouse the student to that point of view which is alone worthy to follow along with the progress of medicine.

There seemed to be a danger at one time that the term Shell-shock would close down over diagnostic and therapeutic vision according to the tendency of intellect to adopt labels and satisfy itself that names have a right to presuppose entities. Southard has not only shown that growing experience expanded inevitably beyond this danger. He so utilizes the name that it serves to accommodate the lay mind. There is just enough suggestion in it of possibility of special phenomena to throw sufferers back upon technical help in the face of actual conditions. At the same time Southard presents the term in all its fulness to the members of the profession so that it forms a fertile starting point into all the directions in which experience has already led. These are those which the collected case histories amply illustrate. Yet each one of these stands with that incompleteness which emphasizes the vital, unfixed quality of the matters in hand. In each one the situation is described, the precipitating accident—unless in some instances even this is absent—the symptoms, the previous history of the patient. The conclusions as to the exact relation of these factors is left for the openminded investigation and consideration of the neuropsychiatrist. The matter is presented merely as data to be counted up in the long study these things deserve. The question of the relation of precipitating cause to previous psychopathic disposition or organic disease, latent or partially active, is in no wise neglected.

Of particular interest are the factors discussed in the delimitation of shell-shock cases and then their differential diagnosis, the importance of which is discussed in the *Epicrisis* of the book. Here arise the important problems of the presence of syphilitic disorder, as complicating shell-shock, preceding it or being rendered active by it. Emphasis is laid upon the far-reaching significance of these questions extending as they do beyond the merely medical or even the military field. The same may be said though perhaps in a lesser degree of alcoholism and other toxic psychopathies, dementia praecox, the cyclothymias and of all the range of psychoneurotic and psychopathic disturbances. Organic diseases must be taken into account in the same way.

Here Southard makes a clear statement of the wide conception that must be held concerning organic diseases. Too often he says one carelessly uses the term organic disease only for subcortical affection. He points to the necessity of considering all organic possibilities before one adopts too exclusively a distinction between psychogenic and organic disorders. The increasing tendency to draw psychic and physical closer together in their interdependence would justify his consideration of possible unperceived lesions cortical or otherwise as underlying or at least closely associated with conditions that grossly seem to be only psychopathic. Yet in urging this he shows the same inclination to separate physiopathic and psychopathic with which Babinski has often excluded the interaction

of unconscious psychopathic reaction from its participation in reflex disorders. This however and a matter of making use of terms which many neuropsychiatrists have left behind as too unilluminating hardly prove defects of the book. They like all else in the material are handled with such freedom of interest, so evidently laid out as material with which to press ahead to clearer distinctions and more fruitful turning over of the ground that they can hinder no true investigator. The book might be called a highly charged milestone on the road of progressive neuropsychiatry. Not so much has it recorded the history of a large class of phenomena brought into prominence by the war. It has so investigated them that they are seen to be a collection of everpresent neuropsychiatric phenomena which appear and reappear under industrial conditions under stress of war or whatever particularly calls them forth. As such they indeed challenge constructive consideration. An extensive bibliography adds to the value of the book.

Kraepelin, Emil. DEMENTIA PRAECOX AND PARAPHRENIA. Tr. by R. Mary Barclay. Edited by George M. Robertson. Chicago Medical Book Co., Chicago.

It is at the one time a source of much satisfaction that we finally have an excellent translation of Kraepelin's masterly chapters on Dementia Praecox and Paraphrenia and a matter of disappointment that such a translation should have been delayed to a time when the more static descriptive phases of psychopathology are slowly being remodeled along dynamic and genetic lines. Nevertheless the descriptive genius of Kraepelin has built up a foundation that will endure for a long time and although American psychopathology is well acquainted with the concepts underlying these chapters this handy volume, so well prepared and carefully edited, will be a definite treasure for the psychiatrists and all students of mental problems.

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Original Articles

A CORRELATIVE STUDY OF ENDOCRINE IMBALANCE
AND MENTAL DISEASE

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- I. Introduction.
- II. Method of Selection and Diagnosis.
- III. Presentation of Cases.
- IV. Discussions.
- V. Conclusions.

I. INTRODUCTION

Researchers, both ancient and modern, have constantly and consistently indicated an intimate connection between the endocrine organs, the vegetative nervous system, and the behavior of the animal organism. In ancient times these relations were understood well enough in some respects to occasion the administration of corrective therapeutics in an empirical manner, and at a later period, but still early in the history of scientific investigation attempts were made to determine the actual functions of the glands of internal secretion. Naturally many misleading theories arose from the earlier crude methods of study but an occasional glimpse of the importance of these structures was obtained when an excision of one or more of the most important glands was directly or accidentally performed.

In our usual conceptions of behavioristic mechanisms we con-

sider in addition to skeletal muscles, and the smooth muscles, a group of affective or expressive organs, the endocrine glands. These organs are fundamental to animal existence since they play a principal rôle in metabolism, in the control and the regulation of growth and in the elimination of certain waste products of the body and must abstract from the blood and lymph its nutrient material, and give off their own waste products.

The subject of endocrinology has from time to time been in the foreground of science and has also suffered the alternating lack of attention which we have seen through the history of all sciences. That the subject is not one of late day interest can be seen from the activities of the early Chinese. Sum Ze Woh the Chinese sage in the fourth century A. D., wrote a book called the Thousand Gold Remedies. This work comprises 60 volumes, and it is stated therein, that ground sheep thyroid gland was used as a household remedy for states described, greatly resembling our modern conception of myxedema and cretinism.

The term "internal secretion" was probably first used by Claude Bernard in 1857, applying it to the glycogen and urea formation of the liver. His doctrines were the pioneer foundations of our present conceptions, although in 1849 Berthold performed experiments, in which he transplanted testicles into young caponized birds who then developed the vocal powers, desires to combat and the sexual activities natural to normal cockerels. Although to us this experiment seems remarkable, and a pioneer in the line of internal secretions, but little attention was paid to these results by the physiologists of the time, and our modern clinical knowledge dates back to the period of Addison (1855).

It was not until 1873 that hypothyroidism or cretinism was described by Sir Wm. Gull who brought ten cases before the medical clinic of the University of London. Five years later Ord named myxedema from the deposits of mucin in the skin of people with thyroid deficiency. The relation of the thyroid to these syndromes was proved by Kocher (1882) and by Reverdin (1853). In 1886 Moebius attributed Basedow's disease to hyperthyroidism and in 1889 the work of Brown-Sequard on testicular extracts came into prominence, and Pierre Marie associated acromegaly with disease of the hypophysis.

A description of the syndrome termed dystrophia-adiposo-genitalis was given in 1901 by Froehlich and afterwards by Frankl-Hochwart. Tandler and Grosz were the first to describe eunuchoidism accurately. Frankl-Hochwart and Marburg studied the pineal

gland, and Claude and Guigérot conceived of a pluriglandular syndrome in which all glands participate.

Physiological chemistry has aided tremendously in this field of medicine and early in the twentieth century we approach a period where the chemistry of the internal secretions was first in the field and at this time, because of the striking experimental changes produced in animals by manipulating these substances artificially, there was a super enthusiasm in its application in therapy, so that a wave swept the country in which nearly all physicians participated applying the methods without scientific guidance and without accurate tests as to whether such treatment was needed; so many patients, particularly those of the hyperthyroidism type had their metabolic balances overthrown, and were ushered into states of nervousness and invalidism. Many patients seen in the clinics of today actually date the onset of their nervousness and the beginning of their hyperthyroid state to an active course of thyroid extract administered by the family physician. Because of these detrimental results, glandular therapy became rather unpopular, so much so that less was heard regarding the therapeutic possibilities, but the chemistry kept pace with the chemical investigations in other medical sciences.

Two or three years ago there was a gradual restoration of glandular therapeutics and the attempts of the present day are to put this on a scientific basis, so that they may be applied without danger, and that actual indications in the patient may be followed more correctly. A number of acute and chronic conditions are already subject to organotherapy.

From time to time various specialists in mental disease have formulated ideas regarding the connections of the glands of internal secretions with the different types of psychosis. Kraepelin stated in one edition of his text book that he thought there was a very close relation between the endocrine imbalances and dementia praecox, although the glandular therapy indicated and applied was apparently followed by no desirable effects.

In 1913 Cushing (1) made the following statement in this connection: "These disturbances naturally enough are particularly apt to occur during periods of physiological stress, such as accompanying puberty, the climacteric, pregnancy, etc. States in which there are profound alterations in the functional activity of the glands of internal secretion, with a necessary readjustment in the chemical balance of the body which must in more or less nervously unstable individuals have a profound effect on their psychic organization."

Delgado (2) in his remarks on the psychology of insanity states clearly his feeling that our modern type of endocrinology is demonstrating the connections between psychologic and somatic activities and their influences on each other, and Turro (3) attempts to explain the psychic activities by the physiologic basis on which they rest instead of the physiologic by the psychic as is often done.

In Rossi's (4) nine cases of manic depressive psychosis with suprarenal exhaustion developing after influenza, and in other patients manic depressives with suprarenal insufficiency, a course of suprarenal treatment was extremely beneficial, and seemed to throw some light upon the origin of the disease.

Many others have thought, spoken and published upon the endocrines considering mental disease as only one phase of a disturbance which may in large part depend upon the different constellation of glands (5).

II. METHOD OF SELECTION AND DIAGNOSIS

The present investigation was instituted to determine the relations if any, between the physical manifestation, blood chemistry and the mental syndromes. So a survey was made of the hospital wards and such cases selected as exhibited frank endocrine disorders, without regarding in the least the type of mental construction. So far as the objective features were concerned the cases were taken both from hyper and hypotonic groups, with such characteristics as the following taken into account.

1. Abnormal growth conditions of the skeleton.
2. Muscular dystrophies.
3. The condition of the skin.
 - (a) Scurviness with pruritis.
 - (b) Presenility of covered portions.
 - (c) Myxedematous pads.
 - (d) Abnormal pigmentations.
 - (e) Seborrheic dermatitis.
 - (f) Chronic subcutaneous fibrosis.
4. Trophic changes in hair and nails.
5. Altered action of sweat glands.
6. Sluggish circulation—cold cyanotic extremities.
7. Subnormal pulse, temperature and blood pressure
8. Early arteriosclerosis.
9. Dysgenitalism.
10. Obesity.

11. Nocturnal enuresis, polyuria, or glycosuria.
12. Fatigue without energy expend.
13. Enlargement of thyroid with associated phenomena.

After twenty-two cases had been chosen according to combinations of the above manifestations of endocrine disorder it was decided to make an analysis of all factors entering into each individual case, and in order to rule out as far as possible the personal equation in the analyses, the psychological, physical and the chemical investigations were conducted by different workers, each unaware of the findings of the others.

The following tests were performed on each individual to aid in classifying him as hypo or hyper endocrine.

Sugar Tolerance Test.—The technic used in this test was that of Janney and Isaacson (6); and the Bangs and Hathhol (7) blood sugar method was employed throughout. The blood sugar determinations were checked daily against normal individuals, blanks, and known amounts of glucose so that the errors were kept as low as possible.

Thyroid Function Test.—This test, and method of charting was carried out according to the instructions of Harrower (8), with special attention given to any variations in the behavior of the subject.

A brief outline of the technic of the test is as follows:

First Day. The pulse is taken at 3, 6 and 9 P.M. under as nearly uniform conditions as possible, before eating, and in a sitting position after a ten minute rest.

Second Day. One half grain of thyroid gland is taken in capsules at 8 and 10 A.M., 12 M. and 2 P.M., and the pulse taken at 9 A.M., 12 M., 3, 6 and 9 P.M.

Third Day. One grain of thyroid gland is taken in capsule at same hours as above and the pulse recorded as for the second day.

Fourth Day. Two grains of thyroid gland taken as on above days, and the pulse taken at the same periods.

Fifth Day. No gland. Record pulse at same hours.

Sixth Day. No gland. Record pulse at same hours.

It is extremely important to watch carefully through the test for the signs of supersaturation with thyroid gland which manifest themselves as nervous or tempermental irritability, twitching of the muscles, breathlessness, etc. When these occur during the test it should be immediately terminated.

3. The blood of each patient was examined for:
 - (a) Uric acid, by the method of Folin and Wu (9).
 - (b) Urea nitrogen, by the method of Folin (10).
 - (c) Creatinine, by the method of Folin and Wu (11).

III. PRESENTATION OF CASES

CASE 1. American, male, thirty-four years of age, single, laborer.

Mental Diagnosis. Schizophrenia with projection.

Endocrinosis. Hyperthyroidism (exophthalmic goitre).

History.—His father was a country butcher and drank heavily. His mother had twelve children by three husbands, and was nervous, excitable and scary. The patient work on farms and attended school winters, reaching the fourth grade. As a boy his neck bothered him, especially on the left side, and he noticed it most when running. He used to dream of being chased and caught by police and would wake up out of breath.

At eight he committed mutual fellatio with a gypsy boy. He performed sister incest in childhood and at puberty, and also bestiality both then and during adolescence. At sixteen hemorrhoids became more or less chronic. He went little with prostitutes and once was impotent but masturbated afterward. Intercourse was unnecessary he stated for he could masturbate at home. He indulged in it excessively and has had only two night emissions in his life. One was not connected with a dream and the other occurred with a dream of normal coitus and he awoke to find himself in the sexual position on the farm hand he was sleeping with. He had a long succession of changing jobs: sometimes the work was too hard, or the pay too small, or his employers weren't pleased and he didn't wait to get fired. At twenty, out of work and tired, he joined the Marines for a secure and steady life. Two weeks later he was in this hospital and has been here thirteen years.

The records at various times state that he was restless, incoherent irrelevant, abusive, threatening, always complaining, and tore up his clothes. Then for months he would be stupid and quiet. In the eighth year he was somewhat improved. In the ninth year it was noticed that his thyroid was enlarged. His mental condition improved simultaneously and his mind has remained clear.

His version of the psychosis is that he was nervous and restless and a thousand different thoughts wandered through his mind, including bad ones that were not really true. His clothes burned his

skin so he tore them up. He believed people called him vulgar names, his conscience bothered him, and he tried to kill himself.

During his psychosis he had some homosexual experience with other patients and masturbated much. Now he confines his sexual acts to masturbation in bed if he cannot go to sleep. This occurs about every other night. Once he went four nights without and felt proud of his achievement. He maintains that it is injurious to leave the semen in one's body. He remarked in amazement about the stiffness of other patient's penises, his own being half flabby. His recent sexual dreams were heterosexual and so were his masturbation fantasies. One terrible dream was of his half-brother hacking at his goitre with a knife. He recounted stories of sheep and heifers escaping from his father's knife and running wildly with bleeding throats.

His mind was perfectly clear and he was contented. He dated his mental recovery from the onset of the goitre and said that he had not tired so easily and had felt better since. His memory for events of the psychosis was not as good as those of his previous life. If he could regain his physical health he saw no reason why he could not earn his living as a farm hand. He took an intelligent interest in everything and aided in observing the behavior of other patients. The ward attendant made an assistant of him, and he served meals and looked after and governed the retarded and deteriorated patients. He was full of restless energy but did not like to exercise outdoors because he tired too quickly. He took up basket weaving enthusiastically and worked continually. After mastering one design he preferred to make it over and over again and resisted being taught another more complicated one.

After the thyroidectomy no change could be seen in his mental condition. He was relieved not to feel his pulse in the goitre, and hopeful of improved physical health.

A diagnosis of schizophrenia with compensatory Basedow's disease was made on this patient. The glandular enlargement was termed compensatory in lieu of the fact that mental improvement was simultaneous with the on-set of the thyroid hypertrophy and total recovery followed the development of the goitre.

Although the neck conditions indicated operative interference an operation was somewhat debated because of the above mental correlation, and from fear that the active psychosis might return.

On April 15, 1920, a partial thyroidectomy was performed, which was followed by an aspiration pneumonia and final complete recovery.

OUTLINE OF CASE 1

Behavior	Physical	Laboratory
Restless, abusive.	Tall, slender, 132 lbs.	Wassermann negative.
Hallucinating vulgar names.	Thin gray hair of head.	Blood pressure $158/56$.
Threatening, always complaining and destructive to clothing.	Scanty body hair.	Blood uric acid 2.6 mg.
Above reaction alternating with periods of quiet and stupidity.	Hyperhidrosis.	Blood urea 36 mg.
Masturbation.	Pulse 96, tachycardia.	Blood creatinine 2.5 mg.
Overtly homosexual.	Slight systolic murmur.	Steatorrhea.
With onset of goitre the mental condition gradually became normal, and an intelligent interest was taken in current matters.	Reflexes hyperactive.	<i>Thyroid function test</i> not done.
	Fine toxic tremor of fingers.	<i>Sugar tolerance test.</i> Prolonged curve.
	Marked bilateral enlargement of thyroid region with bruits and thrills as far as clavicles.	
	Tonsils atrophic.	
	Periodic diarrheas.	
	Eye signs.	
	Exophthalmos — Von Graefe.	
	Dalrymple-Von Stellwag.	
	Von Stellwag.	
	Moebius.	
	Giffords-Joffroy.	
	Epiphora.	
	A. Kocher.	
	Abnormal dryness of eyes.	

Microscopical examination of excised tissue shows this gland to be of the pure densely glandular exophthalmic goitre type.

CASE 2.—American, male, aged forty-nine, married, a sailor.

Mental Diagnosis. Schizophrenia with projection.

Endocrinosis. Polyglandular syndrome.

History.—The patient was so badly deteriorated that nothing of his history could be learned except from the records. At the age of fourteen a horse kicked him in the head, lacerating his scalp. After that his father thought the patient's attitude towards him changed. In late adolescence he drank a good deal but stopped after getting married. His wife said he was irritable and was easily excited. He left her and their five children and served two enlistments in the Navy. During the second he was taken sick. He had hard headaches, was unable to sleep and grew weak. Before reaching St. Elizabeths hallucinations and delusions of persecution developed and he had one severe epileptiform seizure lasting five minutes. There is no record of epileptiform seizures in this hospital. He has had hallucinations of all senses and delusions of persecution which made him talk in a homicidal manner. Voices insulted him, and at times he was very unruly. He complained of pain in the upper left

arm and right leg where he said his mother had cut him. No scars were visible.

He was an ugly, unkempt man, who usually sat with his head on chest and eyes closed. From time to time day and night he broke out into long angry tirades. These scoldings were almost exclusively directed against people who could not do such good work as he, and did not recognize his superior efforts, but they apparently referred to his pre-navy days. Sometimes he scolded about his food. In these outbursts he articulated with difficulty, right side of his face seeming somewhat spastic. Once in a great while he would indulge in bitter ridiculing laughter.

Coincident with the three day test of thyroid feeding, he grew more active, scolding even louder, if possible, and showing more initiative. He soaped and scrubbed himself in the bath. Formerly the attendant had had to do this.

OUTLINE OF CASE 2

Behavior	Physical	Laboratory
Severe head injury at puberty.	Slender skeleton but muscular.	Wassermann negative.
Periodically alcoholic at early age.	Skin roughened and muddy in appearance—pigmented over shoulders and chest. Asymmetry of face pronounced.	Blood pressure $140/100$.
Irritable—easily excited.	Shortened side exhibits an occasional choreiform movement.	Blood uric acid 1.50mg.
Severe headaches with hallucinations and delusions of persecution.	Irregular pulse—Extra systoles. Sclerotic radials. Heart enlarged to left. Transmitted systolic mitral murmur.	Blood urea 36 mg.
Hallucinations of all senses.	Circulation of extremities sluggish. Reflexes slightly exaggerated.	Blood creatinine 2.82 mg.
Homicidal threats.	Features of senile decay.	<i>Thyroid function test</i> produced very slight reaction.
"Voices insulting."	Protuberant abdomen.	Heart condition increased by thyroid test.
Combative, angry tirades.	Exophthalmos.	<i>Sugar tolerance test:</i>
Symbolic castrations.	Photophobia.	Hypo-glandular curve.
Inattentive.		
Rambling, disconnected conversation with imaginary voices.		
Gesticulating and threatening imaginary persons.		
Vulgar — quarrelsome, noisy.		

During the thyroid test the pulse which usually averaged 86 went as high as 96, and on the second day after the test was terminated it went as high as 114 and was very irregular. The mitral murmur mentioned above was also accentuated, and it was decided, although the average increase in pulse rate was not high during the test, to postpone thyroid therapy.

This case illustrates the value of preliminary thyroid testing

before the institution of thyroid treatment, since, although the case is frankly a subthyroid condition, there is present an organic lesion in contraindication of this type of treatment, a continuation of which would have probably pushed the patient into a state of complete physical disability.

In the sugar tolerance test the greatest amount was found at the second hour with a gradual drop of the curve during the next two hours.

At the beginning of the thyroid test he became more noisy with the pulse very irregular and rapid. This general behavior changed on the last day of the test and the patient seemed quiet and somewhat somnolescent.

CASE 3.—American, male, aged thirty-six, widower, laborer.

Mental Diagnosis. Schizophrenia (circular).

Endocrinosis. Periodic hypoadrenia.

History.—He was the oldest of four sons and lived an uneventful life on a southern farm. He knew of no abnormality in his family. When a small child he slept between his parents in the same bed but has no recollection of seeing them in coitus. At puberty he accidentally saw his mother expose her leg and he got an erection and masturbated. She caught him at it and whipped him. Small negro boys of the vicinity performed perverse sexual acts and offered themselves to the white boys for five or ten cents. He tried pederasty on one but failed and then had the negro commit fellatio on him. His father caught them at it and whipped them both. He never indulged in perversion again.

His first coitus was at sixteen with a married cousin who invited him. At nineteen he began going with prostitutes and contracted gonorrhoea. At twenty he again saw his mother expose herself and had an erection. Soon after he returned unexpectedly one evening and surprised his parents in coitus. It was a great emotional shock, and he never felt the same at home again; he felt he didn't belong there. He had worked on farms in summer and clerked in country stores in winter, but now he joined the army to see the world and get away from home.

Seeing the world proved to be a sojourn of many years in two barracks. Once he never left the barracks for six months and his fellow soldiers asked why he didn't bring his coffin in. During his service he married, his wife remaining in her parent's home. After the birth of a son he complained that she was flabby and apathetic and he got no satisfaction in coitus with her, so he left her.

After leaving the army he was a visiting nurse in a large city, his chief work being to catheterize old men. Then he got a job as chore man in a private psychopathic hospital but was discharged after a month. He tried for one day to find some other work, then remembering how kindly the insane patients were treated and what an easy life they led, he presented himself at a state hospital and asked to be admitted, screwing up his lips and staring into the distance in an attempt to look "crazy." They said they saw nothing the matter with him but would admit him if he wished (this is his version).

He remained several years, working on the hospital farm. One day an attendant remarked that he saw no use in a man as well as he, staying there, so he ran away and came to Washington where he collected for a garbage wagon for months, working long hours and cooking his meals in a vacant lot. He was brought to the hospital, run down physically and in a filthy condition. He wore long hair and beard and objected to their removal for hairiness stood for physical and mental strength. But once cleaned up he remained neat. He sat quietly and contentedly all day long when brought to our ward.

At first he was content to sit dully in a chair, only speaking when spoken to. He had much difficulty in moving his jaw to articulate. His talk was nearly unintelligible. A sample is "I'll say it's glass that whells itself and begets itself and lets you hear and then collects itself back into line."

In a few weeks his mind cleared and he seemed quite normal. It was then he told his past history. He had no trouble now with his jaw. He took interest in everything, joked, and did artistic occupational work, even originating designs.

In three weeks he went back into a depression, heard voices and talked nonsense. In two more weeks he was alert and said "These voices come when I feel sick, bilious or have indigestion and leave when I feel good." These alert and dull periods lasting from two or three days to a week or two alternated steadily. During depression he sat quietly or worked slowly, and he could play cards well but very slowly, also he could play a good but very slow game of checkers. Occasionally he used clang associations and always had trouble in articulating. Any noise became a voice and he would repeat what passing footsteps or a purring radiator said to him. Sometimes the voices shouted indistinctly in his ear. They talked of birth, sucking a cow, fellatio, son of a b— and when the

attendant wanted him to assist in ward work they objected and said the attendant was supposed to do it himself.

These alternating periods seemed to open different layers of his mind. In remissions he talked normally and his sex ideas seemed normal. If I read him some of the unintelligible stuff he said during depressions he commented that it made no sense. In moderate depressions he talked freely of mother incest and homosexual perversions and methods of escaping impotence. In deep depressions he talked of bisexual monsters and sexual metamorphoses. These alternating periods continued without interruption until he was transferred to another hospital, which occurred before glandular therapy was given a fair trial.

OUTLINE OF CASE 3

Behavior	Physical	Laboratory
Early perversions.	Large sized man.	Wassermann negative.
Mother fixation.	Good station.	Blood pressure $138/40$.
Mild depression.	Slow gait.	Blood uric acid 1 mg.
Heard voices and talked nonsense.	Hair normally distributed—heavy black beard.	Blood urea 16 mg.
Said voices came when he became "sick and bilious."	Fluctuating changes in peripheral circulatory system.	Blood creatinine 1.2 mg.
Articulation somewhat difficult.	Cold extremities.	<i>Thyroid test:</i> Pulse accelerated but slightly.
Clang associations.	Flushing of face and chest alternating with blanching.	<i>Blood sugar:</i> Increased sugar tolerance curve.
Numerous illusions of voiced words. "Always said vulgar things."	White line easily elicited.	
Spoke much of sexual matters, bisexuality and sexual metamorphoses.	Muscles of expression sluggish, almost spastic.	
Above reaction alternated with periods of normality.	Reflexes all sluggish.	
Worked cheerfully.	Pulse 60.	
Joked.	Subnormal temperature.	
Said former speech was nonsense.	Anorexia.	

The patient was started on a course of suprarenal (whole gland) treatment, but was soon transferred to another hospital before definite results were obtained.

CASE 4.—American, male, twenty-nine years of age, single, soldier.

Mental Diagnosis. Schizophrenia with projection.

Endocrinosis. Hypothyroidism associated with hypofunction of the gonads.

History.—He was the youngest of five children and could hardly remember his father who died when he was seven. He had heard that his father criticized his mother for being too affectionate with the oldest son. This brother beat the patient a great deal.

He had trouble in applying himself at school and left at fourteen when he was in the fourth grade. He began masturbating at twelve and kept it up daily or semiweekly though he tried to resist the habit. He worked at various jobs but never succeeded in anything. Soon after puberty he sought intercourse with prostitutes, and frequently was impotent if he went twice with the same woman. Sometimes he tried to get his mind off sex matters and dieted to lessen his desire. He disliked kissing his mother and sister for it might stir up his passion.

He enlisted in the army in adolescence, did not like it, and bought his release. Later he tried the marine corps and was given a medical discharge. Then he wandered from job to job until drafted in the Great War. In three months he was in a hospital and finally reached St. Elizabeths. After five weeks here he was discharged as recovered from an undifferentiated psychosis. He went home, tried one job after another, failed in all and was returned here after nine months freedom.

For the past four years he has had no intercourse and has had no erections since entering the hospital. Perverts in the past have solicited and even half assaulted him but he repulsed them all.

He was a thin, weak looking fellow, and seldom free from an anxious worried expression, which he said was because influence was continually being used on him. His mind had been read and every secret disclosed. Voices urged him to commit perversions with both sexes and sometimes to castrate himself, but they never urged him to perform normal coitus. He couldn't keep his mind on anything because of this constant influence.

He couldn't keep his mind off certain men and he suspected various ones of having improper wishes toward him. He was afraid to go to sleep for fear of sexual assaults. Often he was surprised to find his hands pressing over his genital or a thumb and finger in his mouth. Any attempt on our part to explain these delusions as repressed impulses of his own was vigorously resisted. He would not stick to occupational work but preferred to wander unhappily about the grounds.

The first glandular feeding made him more restless, unhappy and irritable. He began to work spontaneously and was soon

making all the beds in the ward. Later on he grew more tranquil emotionally and said he had periods of about half an hour when he felt entirely free from outside control.

In May he said to another patient that the analyst had told him, he, himself, was pregnant. In July he had a relapse and became more depressed and deluded again, but kept up his work.

OUTLINE OF CASE 4

Behavior	Physical	Laboratory
Industrious.	Tall slender type with elongated narrow head.	Wassermann negative.
Quiet and seldom free from sad facial expression.	Scanty body hair.	Blood pressure 110%. Blood uric acid 1.8mg.
Slightly apprehensive.	Decreased amount of hair over pubes.	Blood urea 14 mg.
Has parole.	Suggestion of early tuberculous lesion in lungs.	Blood creatinine 1.55 mg.
"Uncontrollable" thoughts.	Very susceptible to cold.	<i>Thyroid test:</i> Produced no acceleration.
Hallucinations of voices urging him to commit perversions and to castrate himself.	Perspires easily.	<i>Blood sugar: Tolerance test:</i> Increase typical of subglandular types.
Afraid of sexual assaults.	Fine tremor of extended fingers.	
Mind reading complex with all secrets disclosed.	Circulation sluggish.	
Makes peculiar noise in throat.	Pulse 74.	
Depressed.	Uncertain gait.	
Deluded.	Numerous attacks of "indigestion."	
Speaks only on interrogation.	Several attacks of tertian malaria.	

During the thyroid test he became more active and complaining with numerous anger states during which he threatened his associates.

A few days after the tests were performed the patient was put on orchic, whole gland, four grains daily. After continuing this treatment for the remainder of the month the patient reported that his disturbing thoughts became less often, he was quite pleasant in behavior, there being a considerable change of character, he also stated that he felt better physically and instead of sitting in a semi-depressed state complaining of pains through his body he spent more time enjoying the privileges of his parole.

CASE 5.—American, male, aged thirty-four, married, laborer.

Mental Diagnosis. Schizophrenic originally with projection leading to deteriorated processes.

Endocrinosis. Submyxedema with hypoadrenia.

History.—His father had a primitive mentality and ran a

grocery store. Two paternal cousins were insane. The patient was delicate and backward, and did not like school. He was always seclusive, disliked sports, and had a strong aversion for the opposite sex. After leaving school he worked in the family grocery for five dollars a week and maintenance.

Six weeks before commitment he complained of severe headache, became retarded and stopped work. He acted frightened, said he was full of electricity, and blamed himself as the cause of it all.

In the hospital he still showed fear and self blame and remained in a semistupor, eating only when threatened with tube feeding. For three years he was confused and weepy then became oriented and indifferent. He talked to voices but they did not annoy him. He remained seclusive and never worked. He was an old deteriorated patient who sat around lost in thought, or occasionally looked at pictures or whistled the latest tunes of the graphophone. If spoken to, he would turn away or walk away if possible. Sometimes he laughed heartily to himself, but would never give an adequate explanation. He gave no sign of mental conflict. After glandular therapy began he became a little more extroverted. He was tidier with his clothes, answered questions somewhat more readily, and even consented to try basket weaving. He remained cheerful.

OUTLINE OF CASE 5

Behavior	Physical	Laboratory
Seclusive.	Small type of man, skeleton out of proportion,	Wassermann negative.
Dislikes sports.	heavy upper extremities.	Blood pressure 118/60.
Strong aversion to opposite sex.	Skin is dry and covered with small scars.	Blood uric acid 1.45 mg.
Feelings of electrical influence.	Hair dry, scanty and very fragile.	Blood urea 22 mg.
Dull and apathetic at times.	Patches of pigment over back and chest.	Blood creatine 2.3 mg.
Laughs foolishly when addressed.	Wrinkling of skin of forehead with fibromucinous changes.	<i>Thyroid test:</i> No reaction of acceleration.
Dreamy attitude.	Facial movements deliberate, slow, slightly spastic.	<i>Sugar tolerance:</i>
Childish and stupid.	Reflexes subnormal in extension.	Marked increase tolerance.
Whistles considerably.	Pulse 54.	
Idle and careless of personal appearance.	Circulation very sluggish.	
Laughs out loudly at times.	Extremities cold.	
Hallucinatory.	Slight mitral heart murmur.	
Contented.		

During the thyroid test there was practically no acceleration in the pulse or respiration, but at the beginning of the test the patient changed almost immediately from a shut-in type who would turn away when addressed to an active, basket making, complaining person. He complained of feeling ill with pains in his chest and in fact his pulse was irregular and his heart murmur exaggerated, which in a way parallels Case 2. However, he was placed on thyroid 2 gr. and suprarenal 2 gr. daily and at the end of a month there was notable improvement, in that the patient was more extroverted, more active physically, and showing a better tone in his circulatory system.

CASE 6.—American, male, aged thirty-five, single, horseman.

Mental Diagnosis. Schizophrenic with projection.

Endocrinosis. Hypothyroidism with obesity.

History.—His father drank periodically and an uncle died insane. He reached the fifth reader at fifteen years of age and then worked at many jobs, usually about horses. When automobiles displaced horses he should have learned that business, but something in him "didn't want to." He didn't earn enough money to marry.

Finally he joined the army and his record was a long list of dishonorable discharges and prison sentences for fraudulent enlistment, drunkenness and stealing. He thought that after serving in the army three years it was up to them to take care of him the rest of his life. He got the delusion that people wanted to kill him and that he was being hypnotized and forced to say and do things he did not intend to. His memory was imperfect. In this hospital he refused to work, did not associate with other patients, and was irritable and stubborn. Voices accused him of vile practices.

On first entering our ward he reserved a chair and sat in it all day, usually with his coat over his head but not covering his face. Sometimes he sang out of a little music book. He ate voraciously. His clothes were decorated bizarrely.

The occupational therapist got him interested in basket weaving and he worked as long as she would furnish material. Glandular therapy made him more active and irritable.

Apropos of sexual perversions he said another brain, probably that of a bad man, Satan, was trying to control him but he was fighting this other man's brain and deadening it. By June he was more alert and industrious but still wore his baubles and feared he would be killed. As always, much of his talk was unintelligible.

OUTLINE OF CASE 6

Behavior	Physical	Laboratory
Quiet.	Bones of skeleton shortened—fingers stubby—head elongated.	Wassermann ++.
Decorative.		Blood pressure $150/40$.
Eats voraciously.		Blood uric acid 0.8 mg
"Satan trying to control his brain."	Great adiposity, particularly of the abdomen and post cervical region.	Blood urea 16 mg.
Sluggish activity.		Blood creatinine 1.5 mg.
Occasionally slightly excited and talks of sex perversions.	Skin thick—hairless—smooth.	<i>Thyroid test:</i> Reaction of hypothyreosis.
Rather argumentative.	Central eyebrows.	<i>Sugar tolerance:</i> Distinctly of the "hypo" type of curve.
Answers questions with obscure phrases.	Large tonsure of head.	
"Never liked hard work."	Enlargement of mammary glands.	
Claims an unknown man would like to kill him.	Abdominal reflexes absent.	
Hears wireless messages, talking about death, killing and smothering people.	Microphallus, dysgenitalism.	
Thought waves keep him from sleeping.	Moderate arteriosclerosis.	
	Protuberant abdomen.	
	Somnolence.	
	Subnormal temperature.	

On the third day of the test the pulse went as high as 100 points but there was no accompanying nervous irritability with the exception perhaps of more spontaneous nervous talking than usual. During the test there was an immediate response although the patient was gradually getting better before its institution, and he became ambitious, working and reading, and was pleasant and talkative. He was placed on one grain of thyroid gland twice daily showing considerable improvement physically and mentally under treatment.

CASE 7.—Hebrew, male, aged thirty-two, single, teacher.

Mental Diagnosis. Schizophrenia with introversion.

Endocrinosis. Hypothyroidism.

History.—The patient is a Jew born in Russia. He emigrated to this country after completing the equivalent of our eighth grade. He did not care much for sports but dreamed of revolution and bettering the people's condition.

After a year in America he began attending high school, working in a factory afternoons and teaching English to foreigners evenings. He got his diploma at twenty-four and started to attend a college with a three year course. In mid course his savings gave out, and his family borrowed money for him at interest. He now disliked manual labor, and failed to earn money in vacation time. He worried over the interest his relatives had to pay, and his work fell off until finally he was suspended. He had dreamed of being

an author or journalist, but he could not translate his dreams into writing.

He tried dish washing in a restaurant but gave it up as too hard, and sponged off a married sister for a year, getting his A.B. at a free state college. By teaching a year he partly repaid the borrowed money, then returned to his sister's to study for an A.M. But he dreamed too much and flunked. Then he barely made a living in various jobs and finally enlisted in a naval aviation school. Here also he flunked and was reduced to seaman. He had to leave his class just as at college, and life was very unpleasant. He became absorbed in his thoughts, laughed to himself, and failed to fully comprehend orders.

After reaching St. Elizabeths he said he had been nervous and needed a rest but there was nothing the matter with his mind, he could think and remember as well as ever. He stayed in bed for weeks and had to be tube fed for two days. He associated with nobody. He was perfectly content to sit and think, and did not use his parole of the grounds. "Patiently satisfied" he said described his feelings exactly. He didn't care if he never got out of the hospital. He was very loath to divulge his fantasies but admitted they used to be about women and usually ended in intercourse, but now women didn't figure so much for he was no longer young and strong. He denied having had sexual relations but said he paid a girl to strip before him once when he was feeling lonely. He sidestepped questions on sex matters. He had tried to check his romantic dreaming by taking the practical Franklin as a model.

He did beautiful basket weaving but fantasied as he worked. If material gave out, he sat motionless until the instructor supplied him with more. He never took the initiative, and refused to try any other form of handicraft. He merely wished to be left undisturbed to his thinking. "My mind is supreme. I get imagining, then I realize it isn't reality, and I wake up, check myself. I don't see how I'm insane, but I don't care. I make no effort to think of one continuous thing, but let one thought follow another."

He seemed to have no hallucinations or delusions but had an obsession for cleaning his mouth and throat. For hours he would "hawk and spit" in the toilet, and got excited if interfered with. This was the only subject on which questions made him angry. He would never give an explanation.

Glandular feeding speeded him up somewhat. He responded more readily to questions and commands, but did not take any initiative. This improvement persisted. So did the spitting obsession

(probably purification of a fellatio memory). He finally got a distaste for food and talked of his mouth being dirty.

OUTLINE OF CASE 7

Behavior	Physical	Laboratory
"Shut in" type of personality.	Stout stature.	Wassermann negative.
Sometimes appears to be hallucinating.	Weil muscled.	Blood pressure 135/60.
Episodes of throat clearing—becomes excited when prevented.	Skin dry and covered by fine scales and small scars.	Blood uric acid 2 mg.
Often speaks of his dirty mouth.	Hair extremely heavy over central abdomen, chest and shoulders.	Blood urea 18 mg.
Day dreaming behavior.	Reflexes hyperactive.	Blood creatinine 3 mg.
Parole accepted but not utilized.	Slight excitement, pulse reaches 104.	<i>Thyroid test:</i> Hypoglandular reaction.
Mildly negativistic.	Movements slow and deliberate.	<i>Sugar tolerance test:</i>
Unoccupied and stolid.	Extremities cold and cyanotic.	Atypical submyxedematous curve with terminal rise.
Neat in appearance and habits.	Deficient action of sweat glands.	
Stream of talk connected, but no spontaneous conversation.	Thyroid gland only slightly palpable.	
Takes long daily naps.		
No interest in sports.		
Contented to remain forever in an institution.		

At the beginning of the thyroid test he appeared brighter and his pulse was somewhat accelerated. During the test he talked more readily and his general movements were considerably accelerated. After being placed on a grain of thyroid gland three times daily, he gradually became more alert and considerable improvement was seen in the behavior, work, and type of thinking of this patient. The Sugar Tolerance Test shows an atypical curve with submyxedematous characteristics but with a terminal rise which is unaccountable.

CASE 8.—American, male, aged twenty-two, single, sailor.

Mental Diagnosis. Affective psychosis with schizophrenic features.

Endocrinosis. Hyperthyroidism.

History.—He is the youngest of five children. A social worker visited his home and reported it to be comfortable and decent and that his family appeared normal. A sister said he had been a healthy, normal, popular boy. But he told me he had always been up against it and bashful, afraid of strangers, and staying at home rather than associating with other boys and girls. He finished the

sixth grade in school and then worked in a shipyard for good pay.

He was drafted into the army and sent to France. He had his first heterosexual intercourse there, three times in all but failed to get satisfaction. He was told that his penis was too small (his genitals are normal). The army record states he was put in disgrace by his comrades, became listless, and depressed, and it was thought best to reclassify him in order to give him another chance in a new unit. He went into a psychosis before reaching the new unit. He told us that he submitted to pederasty, which was probably the cause of his disgrace.

When he entered our ward he was an unkempt boy, talking incessantly in a low voice, and wandering restlessly.

His incessant talk was disjointed and it was difficult to get him to answer a question. He wandered around unhappily repeating over and over again that he wanted to go home. This was interpolated in a mass of sexual talk, that ran the whole gamut of possibilities. Voices told him to do these things. The devil, a female, gave him these dirty thoughts. He wanted to get rid of his dirty thoughts, have his heart washed clean, and go home. He had many peculiar physical sensations and his emotions varied constantly, often not in harmony with his talk. He was very autoerotic, fingering his nipples, eyeballs and genitals. He called his eyeballs—(vulvas) and accused us of sucking them and his nipples.

He complained that he had no friends, that he hated everybody who assaulted him sexually, that he hated everybody, because everybody hated him. He made erotic advances to both sexes, and sometimes feared homosexual assaults. He resisted a spinal puncture and a physical examination for this reason.

Once in a great while he would say he was a Catholic God or the Kaiser, and then deny it immediately, saying "that's what they tell you," but that it wasn't true. He has good insight, said he was "nutty" and that he wanted to wash himself clean of these dirty thoughts, go home, be rich and have an automobile.

If not carefully guarded he would try to escape, but his judgment was so poor he never succeeded in getting out of the grounds. He was too restless to concentrate on any work. He noticed and wanted to handle every object like an active child. Sometimes he whooped like a small boy and dove into a bed kicking his heels in the air. The next moment he might be weeping at his face in a mirror, murmuring "Dirt and filth, this kid wants to be washed clean."

OUTLINE OF CASE 8

Behavior	Physical	Laboratory
Early history of extreme bashfulness and fear of strangers.	Tall, slender, loosely constructed individual.	Wassermann ++.
Early "shut in" type of reaction.	Actiniform eruption over skin with much ancient scarring.	Blood pressure $138/45$.
Restless wandering.	Protuberant abdomen.	Blood uric acid 1.80mg.
Constant manic stream of talk.	Reflexes subnormal in extension.	Blood urea 26.6 mg.
Aprosexia marked.	Moderate tremor of hands.	Blood creatinine 3.2mg.
Obscene postures and erotic manifestations.	Tachycardia.	<i>Thyroid test:</i> Hyperthyroid response.
Active auditory hallucinations, constant fear of homosexual assault.	Pulse 114.	<i>Sugar tolerance test:</i> Combination fright curve with prolonged absorption time.
Careless in dress and occasionally destructive.	Eyes somewhat prominent.	
Autoerotism—masturbates daily.	Pupils dilated and react strongly to light and distance.	
Complained of dirt and filth everywhere.	Thyroid gland enlarged.	
"Female devil" gives him dirty thoughts.	Hyperhidrosis.	
Constant motor activity.	Anemia.	
Combative—strikes others without provocation.	Patchy surface hyperemias.	
Constant muttering about sexual perversions.	Pubic hair submasculine in type.	

During the second day, third day, and the day after the thyroid test, the pulse went as high as 120 points. He was as usual very noisy, destructive, with obscene production and combativeness—fighting the other ward patients. Physically he appeared pale and exhausted. The value of this reaction is that of leading us away from the institution of thyroid therapy in states of this character, however, he quieted down considerably when given 4 gr. of suprarenal daily, and is at present in a condition well on the road to recovery. The sugar tolerance test gave a curve showing profound initial fright, which was prominent at the time the first blood sample was taken; the curve gradually assuming the characteristics of the hyperthyroid response.

(To be continued.)

THE ABDOMINAL CRISES OF MIGRAINE

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Attacks of abdominal pain as a radical of the manifestations of the migraine characteristic are exceedingly rare. Edward Liveing in his monograph on Megrin refers to abdominal crises by citing a few cases; he visualizes the seizures as follows: "The seizure, periodic in nature, would commence at any hour, and I was never able to discover any cause for it. . . . The pain began with a deep, ill-defined uneasiness in the epigastrium, gradually becoming a dull, but at first very bearable pain. This steadily increased in severity during the next two or three hours, and then declined. When at its height the pain was very intolerable, sickening, and I should say peculiarly visceral in character, of the quality produced by a blow on the epigastrium, and had no gripping character whatever."

In 1911 Schmidt, in an analysis of the gastric symptoms associated with the migraine characteristic, reviewed the previously reported cases of abdominal crises. He also presented briefly the history of a patient with recurring, periodic attacks of sudden deep seated epigastric pain associated with pressure, fullness, eructations, and occasionally, with vomiting. The patient had been subject to periodic migraine seizures all her life, and at times the usual cephalic manifestations were replaced by an abdominal seizure.

Reports of seven cases in which periodic attacks of abdominal pain as a part of the migraine characteristic were found in the files of the Mayo Clinic. Four patients had been operated on elsewhere, and one had been operated on at the Mayo Clinic without the discovery of an organic lesion capable of explaining the occurrence of the seizures.

REPORT OF CASES

CASE III.—(A175730). Mr. E. A., aged twenty-six, visited the clinic October 19, 1916, because of sudden attacks of pain in the lower right side of the abdomen which he had had for five years. His father and mother and three sisters were living and well; one brother had periodic headaches. The patient had had three or four attacks of gonorrhœa. Five months before entering the clinic his

appendix had been removed. The attacks of pain first came every three or four months, but gradually increased in frequency until they occurred about every two weeks. The severest pain usually started in the right side of the back. Fever had never been present. The attacks were always followed by spots and flashes before the eyes, which ceased after three hours and were followed by severe headache and vomiting. He was also subject to frontal headaches which were initiated by red and green lights before the eyes and sometimes were associated with vomiting.

The patient was last heard from in 1917; his general health was good.

CASE VI.—(A311834). Mrs. R. A., aged twenty-eight, visited the clinic March 9, 1920, because of attacks of pain in the abdomen, and headaches. Her father and two brothers were living and well. The mother was living and well, but had been subject all her life to severe attacks of sick headache. The patient had been married eleven years. One child aged eight had unilateral headaches associated with vomiting; one child died at the age of three weeks, and one was living and well. In 1918, the patient had a left salpingo-oophorectomy and right salpingectomy. In March, 1919, her tonsils were removed, and later in the same month all her teeth were extracted. At the age of twenty she began to have recurrent bifrontal headaches, about three each month. The headaches lasted from one to several hours, and were relieved by vomiting or by sleep. Recently the headaches had become less severe. Before the onset of the headache she frequently felt a tender lump about 3 cm. in diameter in the epigastrium, which was the point of severe pain. Frequently she had similar pains in the pelvis preceding menstruation: these pains lasted a short time and were followed by headache and vomiting. She was not benefited by the operations.

CASE I.—(A130693). Mrs. G. U., aged thirty-six, visited the clinic May 13, 1915, complaining of attacks of abdominal pain and headache with vomiting, which had begun when she was seventeen and occurred once each month. The abdominal pain began when she was twenty-five. The attacks lasted from twenty-four to thirty-six hours. The headache began either before or after the onset of the abdominal pain. The pain radiated over the right side of the abdomen and was associated with vomiting and gas. Her mother, sister, and one brother had similar headaches. She had two children living and well. In 1911, she had had an appendectomy and cholecystostomy, and in 1916, a cholecystectomy. Following the removal of the gallbladder the attacks occurred oftener than once a month. Between attacks the patient was well.

CASE II.—(A164576). Miss A. H., aged sixteen, first visited the clinic June 28, 1916, complaining of attacks of severe abdominal pain with headache. Her mother and one sister were subject to sick headaches. Her father, three sisters, and two brothers were living and well. One brother had died in infancy. Since 1912 she had had attacks of severe pain in the lower right side of the abdomen. This

was preceded by a severe frontal headache, followed by nausea and vomiting.

June 29, 1916, her appendix was removed at the clinic for what was considered chronic appendicitis.

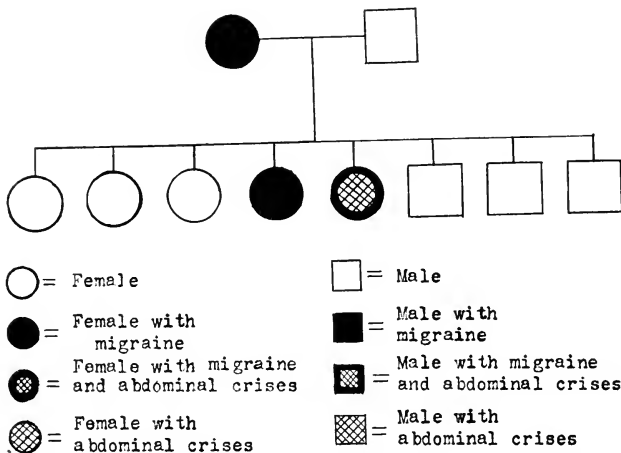


FIG. 1. The distribution of migraine and abdominal crises through two generations.

The patient was again examined at the clinic in December, 1920. Following appendectomy she had had no attacks of abdominal pain until November, 1919, when they again became frequent, and for the first time were preceded by a flashing of irregular light before the eyes; at times she could see only half of another person's face. The flashing light continued for a half hour, and was followed by faintness and dizziness. With the onset of these sensations vomiting commenced and was accompanied by severe bifrontal headache which radiated down the bridge of the nose. She was well, except for these temporary attacks. Figure 1 illustrates the transmission of migraine in the family.

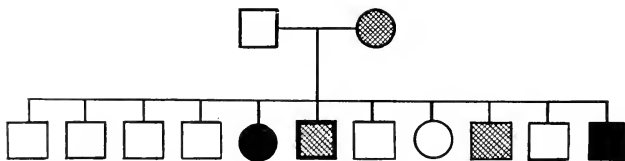
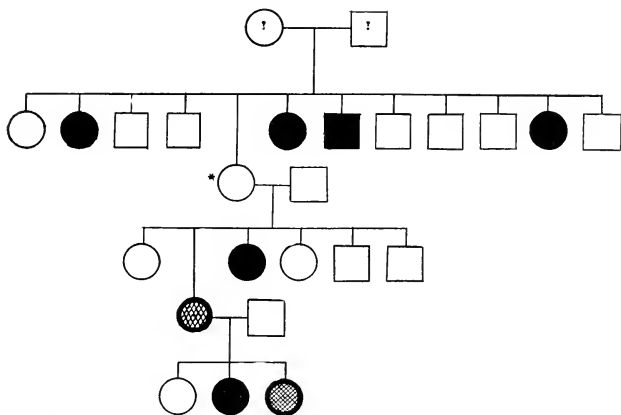


FIG. 2. The distribution of migraine and abdominal crises through four generations.

CASE V.—(A305580). Miss E. V., aged eighteen, visited the clinic February 6, 1920, on account of attacks of pain in the left lower abdomen. Her father and mother were subject to periodic headaches. The father's attacks were very severe, the mother's attacks mild. The patient had had diphtheria and frequent attacks of tonsillitis. During her twelfth year her tonsils were removed; during her sixteenth year her appendix was removed, and during her



* Heterozygote

FIG. 3. The distribution of migraine and abdominal crises through two generations.

seventeenth year a cystic ovary was removed. As long as she could remember she had been subject to frequent sick headaches which were of two distinct varieties. One type was mild and occurred every two or three weeks; the other type was very severe and occurred at about the same interval, was bifrontal, and followed the attacks of recurring pain in the left lower abdomen. Attacks of severe abdominal pain first appeared in August, 1918, in the region of McBurney's point, and at that time the patient experienced tenderness over the entire abdomen. She had no nausea, no constipation, but had a general sensation of chilliness. Between August and September, 1918, the patient had eight or ten attacks of severe abdominal pain, which required morphine. After the oöphorectomy in September, 1918, the patient was well for three months; she then had another very severe attack of pain in the left lower abdomen. At the time of examination the attacks occurred about every twelve or fourteen days. In the interval, with the exception of occasional mild headaches, her general health was excellent.

CASE VII.—(A342175). Mrs. H. W., aged thirty-six, visited the clinic November 29, 1920, complaining of attacks of pain in the

abdomen. The family history is illustrated in Figure 3. She had been married eighteen years, and was the mother of three children. The patient had never had any other abdominal complaint and had not been operated on. When she was eighteen she had begun to have attacks of bilateral frontal headache of marked severity, which occasionally lasted two days. For sixteen years the headaches were associated with vomiting, but during the past two years this symptom had disappeared. In all the attacks she had diffuse tenderness and pain over the abdomen. Between attacks she was perfectly well. She also had essential asthma.

CASE IV.—(A245593). Mr. H. C., aged fifty, visited the clinic September 13, 1918, because of attacks of abdominal pain and headache. The family history is shown in Figure 3. The patient had been married sixteen years, and his wife and five children were living and well. He had had influenza and malaria. During his sixteenth year on various occasions he had had scintillating dark and bright spots before the eyes associated with great nausea, blindness and vomiting. The attacks lasted from three to four hours. During this period he had intense steady pain in the stomach. His mother had had attacks of severe abdominal pain. Her attacks, which came on about twice a year for a period of ten years, lasted from three to four hours. During the attacks she had impaired vision, was dizzy, went to bed, and vomited, but was never known to complain of headaches. A younger brother had similar attacks of abdominal pain and cramp; one sister and one brother had the more usual type of migraine attacks. Figure 2 illustrates the segregation of the characteristic in the family.

COMMENT

Besides the general physical and neurological examination of these seven patients, eye, ear, nose and throat examinations were made; röntgenograms were made of the chest, kidneys, ureters, urinary bladder, stomach, and colon. The blood cells were counted, and the urine and the gastric contents were examined. The blood Wassermann test, and cystoscopic examination were made. All examinations were negative.

The most significant factor in the seven cases, from the diagnostic viewpoint, is the association of the common manifestations of the migraine characteristic with the attacks of abdominal pain. It would be impossible to differentiate the abdominal pain of migraine in the absence of a personal or family history of migraine. In all cases the family tree should be carefully studied.

In a review of the cases presenting the migraine characteristic registered at the Mayo Clinic in 1919, the percentage of patients on whom operations had been performed in order to cure the incurable was sufficiently large to suggest that the necessary emphasis has not

been placed on the futility of operating or of administering medication for this condition. If the greater number of patients who present the cephalic expression of migraine are operated on it is natural that a majority of those with abdominal crises should also be subjected to surgical interference.

Migraine has always been considered to a certain extent hereditary. This statement has been made by a great many writers on the subject. The hereditary constitution of the condition has rested on the observation in a certain percentage of cases of a similar condition in one of the parents. This observation, however, does not prove any characteristic to be hereditary, and moreover a characteristic is not proved hereditary in ten per cent. or in any per cent. of instances (4). It is either a hundred per cent. hereditary or it is not hereditary at all. Biologists have formulated certain rules governing the mechanism of heredity, and the study of 117 families with migraine showed it to be transmitted as a simple mendelian character (1). If a condition is transmitted by an integral part of the ovum or spermatozoon, according to the rules of heredity, the condition becomes a biologic part of the individual of the new generation. The character will present itself according to the nature of the physicochemical substances of the germplasm on which it depends (2). An appreciation of the significance of heredity makes it obvious that there is no operation nor medication which can change variations from what is commonly considered the normal, if it can be shown that the variations are an integral, physiological constituent of the individual.

The peculiar condition which is designated migraine needs to be taught as a special type of normal, and not as a disease. At present we are taught but one normal. As studies in heredity are made, and conditions are found to fulfill its principles, it will be necessary to transfer these conditions from the disease column to a special classification under our present normal. In the case of migraine, the presence of pain makes one hesitate to consider the characteristic as an expression of a special type of normality. The close adherence of the transmission of migraine to the laws of heredity overcomes this doubt. If the majority of persons were subject to painful seizures, the minority, who were without such occurrences, would be consulting physicians for what they considered an abnormality. We have this hypothesis satisfied in the migraine patient who consults a physician concerning a biological characteristic, which if altered before the termination of its natural cycle would render the patient biologically abnormal.

In conclusion, it may be recalled that there is a small percentage of persons who inherit and transmit the faculty of presenting at certain intervals painful and associated somatic disturbances. The pain is usually located in the head, but may be in the abdomen, as illustrated by the seven cases in this series. To this characteristic the name migraine is applied as a means of classification and identification. The characteristic is unaltered by surgical or medicinal therapy.

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THE SACHS-GEORGI REACTION IN NEUROSYPHILIS

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In a comparative study of the Wassermann reaction and the Sachs-Georgi reaction for syphilis recently published (1) we found that the Sachs-Georgi reaction was positive not only in practically every Wassermann positive serum, but was positive in a considerable number of cases (clinically syphilitic) in which the Wassermann reaction was negative. In our study it was observed that the majority of these sera (Wa—, SG +) were obtained from patients with syphilis of the nervous system. Under the circumstances we believed that a more detailed examination of the Sachs-Georgi reaction in syphilis of the nervous system might prove of value.

Methods useful in the early diagnosis of syphilis of the nervous system have received the attention and the careful study of neurologists and syphilographers because of the obvious clinical importance. Were we possessed of a certain means of diagnosing syphilis of the central nervous system before severe symptoms became manifest, untoward late results might at times be prevented or their frequency lessened. Under present conditions many cases of syphilis now dismissed as cured when the Wassermann reaction becomes negative after treatment, ultimately develop severe neurosyphilis before again coming under proper medical attention.

The Wassermann test has not been as successful in aiding our diagnosis of early syphilis of the nervous system as we might wish; this fact becomes evident when we observe the development of neurosyphilis in the so called cases of latent syphilis and of congenital syphilis with negative Wassermann findings. Of course when the clinical evidence has developed the serological reaction is usually merely of corroborative import. To illustrate the wide divergence between the clinical and the serological examination of these cases we may cite the statistics presented by Noguchi (2) concerning the percentages of positive Wassermann findings in the spinal fluid of neurosyphilitics.

Hereditary syphilis	80 per cent.
Cerebral and spinal syphilis	50 per cent.
Paresis	73 per cent.
Tabes	53 per cent.

None's (3) percentages of positive Wassermann reactions in neurosyphilis are somewhat higher, stating that even the blood examination gave him 60 per cent. positive in tabes and 95 per cent. in paresis.

In view of the advantage of the Sachs-Georgi reaction in the simplicity of its technic, in the fact that it appears earlier and remains positive longer after treatment in syphilitic infection, as well as in the fact that it is frequently positive in congenital, latent and parasyphilitic disease, its adoption in diseases of the central nervous system would seem desirable in permitting closer control of the therapy and more reliable correlation between clinical finding and serological examination.

MATERIAL AND TECHNIC

The technic used in these examinations and the reading of the results was similar to that previously described with the exception that we have used 6 drops of cerebrospinal fluid instead of 3 drops as in our former tests. Georgi (4) has modified the original technic of the Sachs-Georgi reaction for spinal fluid and recommends the use of 1.5 c.c. of spinal fluid to 0.75 c.c. of diluted extract. We have made use of inactivated sera and spinal fluids throughout, although we observed no difference in the reactions when fresh or inactivated sera or spinal fluids were used. Theoretically the inactivation of the fluids to be examined might have some advantage in that Noguchi (2) has shown that when serum is heated to 56° C. for 30" the proteotropic group is destroyed thus eliminating the euglobulins and the paraglobulins from taking part in the reaction.

In carrying out the tests we used not only the antigens described in our previous paper, but in addition have used the original cholesterinized beef heart antigen No. 27 and cholesterinized human heart extract No. 1 which Professor Sachs kindly placed at our disposal. In the comparison we observed no marked differences in the results of the final 48 hour readings, although some variation was noted with different antigens in the 24 hour readings, *i.e.*, the relative speed of the reaction seemed to vary with some of the antigens used.

In the following tables the results of the examination of the serum and of the cerebrospinal fluid by the two methods of examination are recorded.

From the first table it will be observed that of the 39 serum

SERUM

Reaction									
Wassermann.....	Positive			Negative			Anticomplementary		
Sachs-Georgi.....	+	±	-	+	±	-	+	±	-
	16	0	0	7	1	15	0	0	0

CEREBROSPINAL FLUID

Reaction									
Wassermann.....	Positive			Negative			Anticomplementary		
Sachs-Georgi.....	+	±	-	+	±	-	+	±	-
	22	0	1	11	1	25	1	0	0

CLINICAL FINDINGS OF THE CASES IN WHICH THE BLOOD SERUM WASSERMANN REACTION WAS NEGATIVE AND THE SACHS-GEORGI REACTION POSITIVE

Patient	Clinical Diagnosis	Clinical History	
C-15.....	Cerebro-spinal Syphilis	Chancre 10 years ago Romberg +++ Argyll-Robertson pupils Mental disturbances	
D-53.....	Suspected Tabes	Shooting pains Tabetic crisis Chancre 10 years ago	
E-17.....	Cerebro-spinal Syphilis	Chancre 20 years ago Scanning speech	
O-2.....	Early Tabes	Gastric crisis Girdle pains Chancre 5 years ago	
O-4.....	Early Taboparesis	Gumma of septum Dementia Slurring speech	
O-23.....	Juvenile Paresis	Father parietic Slurring speech Underdeveloped	
O-29.....	Suspected General Paresis	Chancre 8 years ago Romberg +++ Argyll-Robertson pupils	

IN THE FOLLOWING CASES WE WERE ABLE TO SECURE SPINAL FLUIDS WHICH WERE WASSERMANN NEGATIVE, SACHS-GEORGI POSITIVE

Patient	Clinical Diagnosis	Clinical History	Spinal-fluid Findings
A-59.....	General Paresis	Argyll-Robertson pupil Dementia Romberg +++ Chancre 9 years ago	Clear Pressure increased Nonne ++ 25 cells per c.m.
D-56.....	General Paresis	A. R. pupils Reflexes exaggerated Dementia History of chancre	Clear Pressure increased Nonne ++ 30 cells per c.m.
D-58.....	General Paresis	A. R. pupils Reflexes exaggerated Romberg ++ Chancre 10 years ago	Clear Pressure increased Ross-Jones ++ 20 cells per c.m.
D-59.....	Suspected Tabes	Shooting pains Gastric crisis Blood Wassermann ++++	Clear Nonne ++ Pressure increased 11 cells per c.m.
D-61.....	General Paresis	Aortic aneurysm A. R. pupils Scanning speech Chancre 15 years ago	Clear Pressure increased Ross-Jones ++ 27 cells to c.m.
E-42.....	Tabo-paresis	Cerebral symptoms Blood Wassermann ++++	Clear Pressure increased Ross-Jones ++ 17 cells per c.m.
F-20.....	Cerebro-spinal Lues	Chancre 8 years ago A. R. Pupils Romberg +++ Reflexes exaggerated	Clear Pressure increased Nonne ++ 5 cells per c.m.
H-45.....	Suspected cerebro-spinal Syphilis	Epileptic attacks Hutchinson's teeth Saddle nose Slurring speech	Clear Pressure increased Ross-Jones ++ 50 cells per c.m.
H-47.....	Cerebro-spinal Syphilis	Syphilitic periostitis Tertiary syphilis 8 months ago	Clear Pressure increased Nonne ++ 12 cells per c.m.
O-39.....	Juvenile Paresis	Father paretic Hutchinson's teeth Slurring speech	Clear Pressure increased Nonne ++ 14 cells per c.m.
O-42.....	Suspected General Paresis	Chancre 18 years ago Tertiary lues 6 years ago Dementia A. R. pupils Under antispecific treatment	Clear Pressure increased Ross-Jones ++ 15 cells per c.m.

examinations there was an agreement of 80 per cent., with 7 cases in which Wassermann reaction was negative and the Sachs-Georgi positive, and one serum in which the Wassermann reaction was negative and the Sachs-Georgi doubtful.

Of the 61 cerebrospinal fluids examined there was an agreement of 77 per cent. with 11 negative to the Wassermann but positive with the Sachs-Georgi. One positive Wassermann fluid was negative with the Sachs-Georgi.

We have selected 100 clinically positive cases of neurosyphilis as diagnosed by members of the attending staff of the Cook County Hospital. We then made the serological comparison by means of the Wassermann and Sachs-Georgi reactions. In the following table we have briefly recorded the clinical findings of the cases in which the Wassermann reaction was negative and the Sachs-Georgi positive.

DISCUSSION

Although the Wassermann reaction may be acknowledged the most valuable among the several methods for the serodiagnosis of syphilis, the complicated technic as well as the number of biologic reagents necessary to carry out the test, restricts its employment to some extent. Among clinicians too much importance is frequently attached to negative Wassermann findings; it cannot be too strongly emphasized that whereas a positive Wassermann test is evidence of syphilitic disease, a negative reaction by no means rules out the probability of the syphilitic etiology of symptoms under consideration. Particularly is this true of neurosyphilis.

Hoffmann, Wechselmann (5), Wile and Stokes (6), Wiley and Hosley (7) among others have called attention to the involvement of the nervous system during the primary stage of syphilis, while the Wassermann reaction of the spinal fluid does not at this time become positive. Kingery (8), studying the spinal fluid of congenital syphilitics, also demonstrated the unreliability of the Wassermann reaction in the fluids of these cases. Meirowsky and Leven (9) have shown that three patients who were given abortive intravenous treatment in primary syphilis, with constantly negative Wassermann findings, later developed neurosyphilis.

In the 100 cases of neurosyphilis here studied by both the Wassermann reaction and the Sachs-Georgi reaction the comparative results can be tabulated as follows:

Wassermann positive	39	Sachs-Georgi positive	57
Wassermann negative	60	Sachs-Georgi negative	41
Anticomplementary	1	Doubtful	2

From this tabulation the advantage of the Sachs-Georgi reaction

would seem manifest. This corresponds in general with the findings of Nathan and Weichbrodt (10), Schönfeld (11), Raabe (12), Eicke (13) and others. While the number of cases which we have been able to study is small, in view of the agreement of similar studies carried out by other observers, we have gained the impression that the Sachs-Georgi reaction may prove of considerable value in this particular field.¹

SUMMARY

In an examination of the serum or the spinal fluid of 100 cases of neurosyphilis (tabes, paresis, cerebrospinal syphilis, etc.) an agreement of 78 per cent. was found between the Wassermann and the Sachs-Georgi reaction.

In 18 cases the Wassermann reaction was negative and the Sachs-Georgi reaction positive.

In view of the extreme simplicity of the Sachs-Georgi reaction as contrasted with the Wassermann reaction, we are of the opinion that it offers a valuable aid in the diagnosis of neurosyphilis, used alone or as a control of the Wassermann reaction and supplementing it.

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¹ The following corroborative conclusions of W. W. Harryman have appeared in the *Archives Derm. and Syph.*, Vol. 4, No. 3, Sept., 1921, page 299, since our manuscript was submitted for publication:

1. The results of the Sachs-Georgi reaction on the spinal fluid closely parallel those of the Wassermann test.
2. The Sachs-Georgi reaction is a substitute or may be a valuable addition to the Wassermann test on the spinal fluid.
3. The Sachs-Georgi reaction furnishes a means for an earlier sero-diagnosis of central nervous system syphilis than the Wassermann test.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

THREE HUNDRED AND NINETIETH REGULAR MEETING, HELD AT
THE ACADEMY OF MEDICINE, OCTOBER 4, 1921

The President, DR. FOSTER KENNEDY, in the Chair

A CASE OF ACUTE NEURONITIS

DR. THOMAS K. DAVIS presented a young Portuguese of twenty. He had been a marine fireman. His family history was negative. He had always been well. There was no history of alcoholism, drug taking or of venereal infection.

A year ago he had typhoid of indefinite character. Several months after recovery he noticed a weakness in the arms. For two months this continued and then weakness in the left leg began. This progressed and became quite severe, and soon extended into the right leg. After the third month he was unable to walk except with a great deal of assistance.

He had no bladder difficulty, nor eye symptoms, and no somnolence. One month ago on examination he had nystagmus to the left and sometimes to the right. Otherwise all the eye reactions were normal. Swallowing and speech were not disturbed.

The left arm showed weakness of the triceps and biceps. There was slight weakness of the flexors of both arms. The trunk muscles were strong. There was weakness above and below the knees, and a complete foot drop. The knee jerks were absent and also both Achilles jerks. The left biceps and triceps reflexes were absent. The right epigastric and abdominal reflexes were diminished; those on the left were absent.

He had a partial left hemianesthesia. The right side showed a stocking anesthesia.

Tactile sensibility, at first thought of as a dissociation, but proven otherwise, was found. It stops above approximately at the angle of the jaw. Sensation in fingers and toes is normal.

Slight atrophy in the arm and in the leg flexors was present, but the nerve trunks were not tender. The electrical responses were not pathological.

His general health is good. Blood sugar had been ninety milligrams per hundred c.c. Spinal fluid; Wassermann negative, eleven cells. The blood pressure is 110; the blood count normal.

Massage and galvanism produced some improvement. The ab-

dominal reflexes became stronger, the right knee jerk can be obtained by Jendrassik and there is a partial return of the right Achilles jerk.

These findings have impressed us as being due to some toxic insult to the peripheral nerves, with root involvement. As the sensory and chief motor symptoms are both on the same side, the sensory signs on the right side being of the stocking type, the spinal fluid normal, and as the case is improving, in addition to which electrical changes are of a quantitative type, all these argue for this diagnosis. The single finding of nystagmus might suggest multiple sclerosis.

CASE OF GASOLINE OR GAS POISONING

DR. W. M. KRAUS presented this case as one of an occupational disease in a man who had been working, prior to admission to the hospital, about a gas-engine, in a place where he was subjected to the fumes from the exhaust. He started working at that particular job in August, 1920. He entered Bellevue Hospital the following June, complaining of numbness, weakness and coldness in the legs, hands and forearms. This had begun in February, when he had dizziness, nausea, frontal headache, and was not very well. His legs slowly became weaker, so that by April he had to stop work because he could not walk. He had no other symptoms referable to his nervous system, or to his intoxication. His cranial nerves were quite normal. He had a hypaesthesia of a stocking variety, running up almost to the knee, in both legs, and a slight defect in position sense in both toe joints. He was unable to stand up.

Six blood Wassermanns and three spinal fluid Wassermanns were negative. The last blood Wassermann was followed in about three weeks with salvarsan.

At the present time atrophy without fibrillary twitching of both extremities is present. The superficial reflexes are present.

Thompson, "Occupational Diseases," writing about "Gasoline Poisoning," says: "Lately there have been brought to my notice a number of cases of chauffeurs who were overcome by gasoline fumes, while cranking motor cars in small, unventilated garages. They experienced vertigo, fainting and nausea, and one passed into coma from which it was difficult to arouse him. The symptoms may not develop until the men go into the open air."

About three years ago three men in one garage complained of the same symptoms, and they told me at the time that this disease was not infrequent in the case of chauffeurs. Since then I have had another case but it has not shown the profound atrophy that this does.

DR. KENNEDY called attention to a paper by Gowers, about fourteen years ago. Gowers had a group of gasoline poisoning cases very much resembling vasoneurosis, but without any involvement of the nervous system as such.

DR. E. G. ZABRISKIE said that gasoline poisoning chiefly is referable to the fumes from the exhaust. Therefore, it is probably a "carbon monoxide" poisoning, rather than a gasoline poisoning.

EVIDENCE OF NERVOUS CONTROL OF SOME INTERNAL SECRETIONS

DR. WALTER B. CANNON, of the Harvard Medical School, Boston (by invitation), presented this paper illustrated with numerous lantern slides. He said, in part: My interest in the control of internal secretion began years ago in the observation that emotional excitement inhibits the movements of the stomach and intestines. This inhibition is due to sympathetic impulses. The question arose as to whether the adrenal medulla, which is also innervated by the sympathetic, and whose output, adrenin, mimics sympathetic action in the body, is likewise caused to secrete during emotional stress.

The first evidence in answer to this question was given by de la Paz and myself in 1911. An intestinal strip rhythmically contracting in oxygenated Ringer's solution is promptly inhibited by very minute amounts of adrenalin. It is likewise inhibited by blood removed from the inferior cava in the neighborhood of the lumbo-adrenal veins, if the blood is taken during or immediately after excitement, but is not inhibited by blood taken from the same region before excitement. The conclusion was drawn, therefore, that the adrenal medulla discharges into the blood stream its peculiar product, adrenin, during periods of emotional stress. Later Hoskins and I showed that asphyxia and afferent stimulation, both of which are known to cause discharge of sympathetic impulses, would likewise induce extra adrenal secretion. The evidence thus adduced has been confirmed by various observers using various methods.

The results and the methods leading to the conclusions just mentioned have been criticized by Stewart and Rogoff. They have declared that the output of adrenin from the adrenal glands is not increased by asphyxia, by reflex stimulation, or by excitement, indeed that the secretion is constant and unchangeable. Furthermore, they urge that it is impossible to judge whether the secretion is increased or decreased unless the rate of blood flow is known. I shall not defend the method that we employed, though it can be defended by use of recent evidence that the blood flow in the inferior cava is, in fact, *increased* under the conditions cited, so that the tendency would be not to concentrate a constantly secreted adrenin, but rather to dilute it. In other words, the conditions of blood flow are unfavorable to the result which de la Paz, Hoskins and I actually found. Instead of elaborating this defense, I wish rather to speak of the use of the denervated heart as an indicator of adrenal secretion. In this preparation both vagus nerves are severed, the stellate ganglia are removed, and the heart itself, separated from the somatic central nervous system, remains in the body performing its function, but no longer subject to any influences except those brought by the blood stream. The heart thus isolated is extraordinarily sensitive to circulating adrenin. Though very stable in its rate, it can be made to beat faster by 30, 40 or 50 beats per minute, by inducing asphyxia or reflex stimulation or excitement. Such increases, in our experiments, did not occur or were relatively slight if the adrenal glands

were removed. The same conclusion was drawn, therefore, that was drawn from the earlier experiments, that the three conditions just named induce a secretion of the adrenal medulla.

Again, the evidence has been criticized by Stewart and Rogoff. They repeated the experiments with the denervated heart and found that in certain instances they were able to obtain a marked increase of rate though the adrenal glands had previously been removed. Examination of their results showed that the order of increase of the two conditions was as a rule very different. The heart rate is on the average increased approximately 30 beats per minute if the adrenal glands are intact, whereas the increase is only 6 beats per minute after their removal. Nevertheless there are instances of much larger increases than the average of 6 beats, and these cases must be accounted for.

In experiments in cooperation with Rapport, I have found that the increase cannot be explained by increased blood pressure, arterial or venous, by warmer blood from the abdomen, or by accessory adrenal tissue. It disappears, however, on severance of the hepatic nerves. For the present we may leave the matter at this point and understand that after cutting these nerves reflex stimulation or stimulation of an afferent nerve will produce a pure adrenal effect.

In explanation of the faster heart rate when the adrenal glands are present and an afferent nerve is stimulated, Stewart and Rogoff have suggested that such stimulation by constricting the splanchnic area induces a "redistribution of blood in the body," with consequent concentration of the uniformly secreted adrenin which thereby becomes more effective. This suggestion we have put to test. By use of a "reduced" animal (i.e., one with both carotid, both brachial and both renal arteries tied, the aorta closed below the renals and the mesenteric nerves cut) vascular reflexes are reduced to a minimum. The liver is excluded and the adrenals are the only abdominal viscera left innervated. Typical reflex accelerations of the denervated heart averaging 26 beats per minute occurred in this preparation, although the changes of blood pressure were insignificant or were only moderate variations either up or down. Under these circumstances the more rapid beat cannot be attributed to a redistribution of blood in the body, for the possibilities of redistribution were lacking.

Another test consisted in substituting a stream of adrenalin to replace adrenal secretion after removal of the glands. In this test adrenalin at the rate of approximately 0.0007 mg. per kilo per minute was injected by vein continuously to replace the continuous unvarying adrenal secretion assumed by Stewart and Rogoff to be normal on the basis of a test made inside the body. Typical vascular reflexes were now induced by afferent stimulation, but either no acceleration of the pulse occurred or an insignificant increase of two beats per minute. Again the evidence is clear that the faster rate is not due to redistribution of blood in the body.

Stewart and Rogoff have urged that their method is superior to all others in being quantitative. We have found that the denervated heart in the "reduced" animal can be employed as a means of assay-

ing adrenin. Repeated equal doses injected intravenously at a uniform rate repeatedly produced in a given animal the same or nearly the same maximum increases of heart beat, and if the injections differed in rate the increases likewise differed in degree. When the circulation is thus simplified the acceleration is wholly or chiefly dependent on the rate of injection, and is little, if at all, influenced by variations in blood pressure. By matching adrenalin injections with reflex adrenalin secretion we have shown that when the heart rate is accelerated between 30 and 42 beats per minute, the output from the adrenal glands lies between 0.0032 and 0.0037 mg. of adrenin per kilo per minute, i.e., more than ten times the amount regarded by Stewart and Rogoff as the unvarying normal secretion, when they removed blood and assayed it for adrenin outside the body. Stewart and Rogoff have not explained the discrepancy between their figures for the internal and the external test for adrenal secretion.

From the foregoing evidence we conclude that the results of our earlier work have been justified and that the inferences drawn from it that adrenal secretion is evoked by asphyxia, by reflex stimulation and by excitement, are also justified.

Evidence for Nervous Control of the Liver.—It will be recalled that the denervated heart may be made to beat faster on afferent stimulation though the adrenal glands have been removed, and that this effect is abolished by severance of the nerves to the liver. The inference was drawn, therefore, that some agent arising in the liver is the occasion for the faster rate. Uridil, Griffith and I have shown that stimulation of the hepatic nerves themselves will cause an increased rate of the denervated heart, an effect appearing slightly later than the similar adrenin effect and lasting for a longer time. Furthermore, stimulation of the hepatic nerves will cause a rise of blood pressure. This is not due to a retarded blood flow through the liver, for it does not occur on closure of the hepatic artery and vein. Furthermore, it does occur on hepatic stimulation though all the abdominal viscera have been removed except the liver, and unlike the stimulation of splanchnic blood vessels alone it long outlasts the period of stimulation.

The increments of heart rate vary widely. They are slight if the animal has been fasting or is in poor condition. They are much greater if the animal is digesting meat. These conditions can account for the discrepancies between Stewart and Rogoff's results and those reported by myself and my collaborators as a consequence of splanchnic or reflex stimulation after removal of the adrenal glands. The inference is drawn, therefore, that a substance is given off by the liver into the blood stream which, carried to the denervated heart, raises its rate.

None of the known or supposed products of hepatic activity—glucose, urea or catalase—when injected into the blood stream have the effects produced by exciting the hepatic nerves. Furthermore, the efficacy of hepatic stimulation in causing a faster heart rate when meat is being digested is not seen in an animal which is digesting carbohydrate or fat or which has been fed for several days on either

of these foodstuffs. On the other hand, stimulation is more effective after amino-acids have been injected into the intestines.

For the present we are inclined to draw the conclusion that probably the effects noted are not due to a true internal secretion produced by the liver, but to a discharge from its cells of amino acids or amines which are sympathomimetic in character.

Evidence of Nervous Control of the Thyroid.—Histologists have described non-medullated nerve fibers reaching to the cells of the thyroid gland. Anatomists find that fibers going to thyroid glands arise in cervical sympathetic ganglia. It had been shown that severance of its cervical sympathetic nerves would cause atrophy of the thyroid and that stimulation of these nerves would cause a diminished iodine content of the gland. In 1916, in cooperation with Cattell, I pointed out that if the thyroid gland and neighboring indifferent tissue are connected through a galvanometer, stimulation of the cervical sympathetic cord evokes an action current after a latent period varying between 5 and 7 seconds, an effect which persists after the superior and the recurrent laryngeal nerves are severed. This does not occur if the main trunk of the vagus is stimulated, or if pilocarpin, which is an excitor of vagus endings, is injected. The effect cannot be attributed to the shutting off of the blood supply by vasoconstriction, for total anemia produced by clamping the carotids for a period equal to that of sympathetic stimulation produces no noteworthy electrical changes in the gland. From this evidence the conclusion was drawn that the nerve fibers distributed to the thyroid cells belong to the sympathetic and not to the cranial division of the autonomic system, and since their effects are not indirect through alterations of blood supply, they are indeed true secretory nerves.

The electrical evidence just given was confirmed by the experiments of R. L. Levy in the Harvard Physiological Laboratory in 1916. He made use of the fact that if thyroid substance is introduced into the blood stream standard doses of adrenalin injected intravenously will cause a greater rise of blood pressure than they caused previous to the thyroid dosage. He found that after stimulation of the cervical sympathetic there was indeed a greater effectiveness of the adrenal injections amounting in some instances to as much as 200 to 300 per cent.

Since adrenalin will mimic the action of sympathetic impulses it was to be expected that adrenalin itself would stimulate the thyroid. This Levy found to be the case. Stimulating doses of adrenalin caused a greater effectiveness of the repeated standard doses (which were very small). If the thyroid glands had previously been removed, however, both cervical sympathetic stimulation and adrenalin injections failed to produce an increase of the response to the standard doses.

Levy proved that stimulation of the cervical sympathetic caused the thyroid to secrete promptly. Removal of the thyroid gland immediately after stimulation was followed by an increase of the efficacy of the standard doses similar to that observed when the glands were left in the animal throughout the course of the experiment.

The method used by Levy involved destruction of the upper part of the central nervous system. This procedure did not permit tests to be made on the effects of such stimulation as would in the conscious animal be accompanied by sensations of pain, nor upon the influence of asphyxia. It was desirable to have another method, therefore, which would permit such tests as these to be made.

In 1920, in cooperation with P. W. Smith, I made use of the denervated heart as an indicator of thyroid activity. If the temperature of the animal is kept uniform and the ether anesthesia is likewise maintained at a fairly uniform level, the heart rate does not vary more than a few beats a minute through several hours of observation. With the denervated heart we found that gentle massage of the thyroid gland for two or three minutes would cause an increased rate amounting in some instances to 33 per cent. over the basal rate. The development of the maximal increase was usually slow, requiring from 30 to 60 minutes and passing off in a similarly slow manner. Massage of another gland, for example, the submaxillary, did not cause this effect, and massage of the thyroid would cause it even though the adrenal glands had previously been removed.

We found that stimulation of the cervical sympathetic trunk would induce a similar increase of the rate of the denervated heart, but that this did not occur if the thyroid gland had previously been removed on the stimulated side. Reflex stimulation of the sciatic or brachial nerve, such as would cause sympathetic impulses to be discharged, had the same effect as direct stimulation of the cervical trunk, but with the addition that there was a primary acceleration of the heart due to adrenal discharge. This was followed by the same slowly developing thyroid effect. Asphyxia, likewise, had the same influence. On the other hand, if the thyroid glands had been previously removed sensory stimulation and asphyxia induced only the increased rate due to adrenal discharge.

The foregoing evidence—electrical, cardiac and vascular—is harmonious in testifying to a control of the thyroid through the sympathetic strands in the neck. By connecting the phrenic nerve with the cervical sympathetic and waiting until the phrenic fibers have grown out to the distribution of the sympathetic fibers we have been able in a certain percentage of cases to produce many of the phenomena of hyperthyroidism. When this operation is done, there would be discharged to the distribution of the cervical sympathetic nervous impulses with every respiration. Thus, nerve filaments affecting the thyroid would be continuously excited by normal impulses from the central nervous system. In animals which showed indications of hyperthyroidism there was an increased heart rate running up from the normal, which in the cat is approximately 150 beats per minute, to 225 and even 250 beats per minute. The character of the animal changed from that of a quiet affectionate domestic pet to that of a furtive creature running away from anyone entering the room. There were loose movements of the bowels without evidence of fermentative changes. The skin of the neck and head became thickened in spots, and there were patches of alopecia. The most char-

acteristic alteration, however, was a very great increase in metabolism. In one of the animals the increase of the metabolic rate was 125 per cent. Removal of the thyroid gland on the operated side restored the animal in which the metabolism had been greatly increased to a rate which was within the normal range of variation.

The Nature of the Nervous Control.—Thus far evidence has been adduced that adrenal secretion, an output of a stimulating material from the liver, and likewise thyroid secretion are all subject to sympathetic impulses, i.e., to the activity of that part of the nervous system which is roused in great excitement. It is important to know where the reflex center for this activity is and whether the control of the organs above mentioned is double as in the case of the submaxillary gland (chorda and sympathetic), or single like the biceps, for example, with inhibitory or excitatory impulses affecting the central station.

Answers to these questions have been found for the adrenal medulla in experiments performed by Rapport and myself. We have observed that reflex acceleration of the denervated heart can be evoked after removal of the cerebrum and the corpora quadrigemina. A transection a few millimeters back of these bodies destroys the reflex.

Removal of the adrenal glands (without a fall of blood pressure) lessens the rate of the denervated heart. Under experimental conditions, therefore, a continuous adrenal discharge is going on. Using this as a basis we have regarded slowing of the rate of the denervated heart in consequence of stimulation as being due to diminished adrenal secretion. Such slowing occurs when the central end of the vagus or of the depressor nerve is stimulated in the cat. It may be as much as 24 beats per minute and appears even after the corpora quadrigemina and all parts anterior to them have been removed. It fails to appear when the brain stem is severed a few millimeters back of the corpora and likewise after the adrenal glands have been exercised. We conclude, therefore, that the reflex center for adrenal secretion is located near the upper or front edge of the floor of the fourth ventricle and that is subject to both excitatory and inhibitory nervous influences.

The evidence just adduced places the control of adrenal secretion in a part of the primitive nervous system. It is interesting to note that this region is in close approximation to that which appears to be concerned in emotional expression. Sherrington and Woodworth were able to call forth pseudo-affective reflexes in the cat after ablation of the hemispheres and the thalamencephalon, and Goltz likewise noted many evidences of emotional expression (snarling, snapping, etc.) in a dog from which the cerebral cortex had been removed. Head and Holmes because of clinical studies were led to the conclusion that the thalamus in man is concerned with the affective side of sensation. It appears, therefore, that the emotional reactions of animals are not managed in the neo-pallium but are ingrained in an archaic portion of the nervous system. Possibly it is for this reason that the expression of emotions are so similar in widely different

animals, such as the cat or the dog, and man. The fact, however, that such is the case permits us to use the lower animals in an analysis of conditions accompanying emotional outbreaks and justifies the expectation of finding similar conditions and a similar analysis in human beings. The great interest of study along lines here hinted at lies in the association of primitive and archaic reactions occurring in an ancient portion of the nervous organization of the body and operating upon an elementary form of the nervous system (the sympathetic) with the functions of organs which are fundamentally important for the organism, the ductless glands.

DISCUSSION

PROFESSOR FRANK H. PIKE, of Columbia (by invitation): It is a peculiar pleasure to me to discuss this paper, for two reasons: For many years Dr. Cannon and I have been friends; that is the first reason, and in the second place, it is not very often that some of the physiologists get a chance to talk to some neurologists.

It has long been recognized that the production of an electrical current is an invariable accompaniment of the processes of living matter. Walter has gone so far as to characterize the production of electrical current as a sign of life. Whenever a gland secretes, whenever a muscle contracts, there is an electrical current produced; and today we make wide clinical application of the fact that the heart produces an electrical current; that this current can be led off and its variations measured with precision. We judge the minute changes in the heart merely by its electric cardiogram.

A change in electrical condition of a gland or muscle indicates some change in its degree of metabolism. One may object that the changes are small; that there may be other tissues in that gland aside from gland cells and it isn't always easy to separate the gland cells from the other tissues. The objection probably has some weight; but taking into consideration the other facts that go along with it, there is some nervous control of such an organ as the thyroid.

With regard to the adrenals, I am puzzled. I didn't come here with the intention tonight of saying anything about our own results. It seems a strange fact that Dr. Cannon, beginning with a study of the intestine, should find that the root leads back to the nervous system. It seems perhaps strange that for myself, beginning with the study of the central nervous system, I should somehow or other get into this adrenal mix-up. Yet, such is the case. I don't care to say much about interpretations now. But, if you will pardon me, I will depart from my original intention and briefly describe some things which bear on this question.

Some years ago Professor Stewart and I tied off the blood vessels to the head of a cat. We got a very vigorous response. We get a great variety of blood pressures, we get changes of heart rate, we get changes of respiration, and the whole picture is rather characteristic. While some two or three years ago; more than that, possibly four years ago, Mrs. Lincoln set about analyzing the vasomotor path-

way more in detail—we wanted to find out where these vasomotor fibers came out; we wanted to find out first whether it was the vasomotors that were concerned. We believe now that those vasomotor fibers are concerned. But rather a peculiar thing was noticed. This tying off of the blood vessels to the brain, of course, results in total failure to function. After a time the animal lies as if dead. If you keep up artificial respiration, the heart and the whole other part of the system is open, so that the head is the only part deprived of oxygenated blood. It doesn't do the cat much harm to kill it; in fact, we kill the cat several times. We find that this procedure of tying off the blood vessels for three or four or five minutes, whatever is necessary (allowing this whole change of blood pressure, heart rate, whatever else it is that happens, to go on, until there is a failure of the function of the medulla), restoring of circulation, getting the cat back again, can be repeated as often as eighteen times. The cat seems to be very resistant. Yet, to all appearances, this is a pretty severe procedure.

It was noticed, however, that as the cat was subjected to these successive insults, that the blood pressure curve began to show some differences. We had at first simply the curve rising, a little dip in it, and another rise, and another fall. It was plainly enough one curve. But after these blood vessels had been tied off, say, ten or twelve times, or eight or nine times, depending upon the cat, we began to find a notch in the top of that curve; there is a partial drop in that blood pressure, then it comes back again, and we get a final fall. Towards the end of this series we find that the blood pressure rises pretty sharply and falls perhaps way down to its normal level and again rises. We get this curve breaking up in two; it is pretty symmetrically divided in point of time, but a repetition of this process for three hours doesn't suffice to kill the cat.

The chance observation that the blood didn't clot very readily in such a cat made us suspect that the adrenals might be involved here, so we tied the adrenals off. There is no particular change in blood pressure when this is done, but the picture subsequently is rather different. In some cats, immediately after tying off the adrenals, simply tying off the blood vessels once is sufficient to curtail this response by about fifty per cent. We get simply the sharp rise and the blood pressure falls, say, within half the time occupied by the control. Sometimes four or five conclusions are necessary, but invariably the animal dies; we find that it is impossible to bring it back, after this procedure has been employed a few times. There is something in that adrenalin which is extremely necessary for this relationship between smooth muscle and sympathetic nerve. I have an idea that without the adrenals, neither people nor animals would be able to stand nearly as much as they do in this world. It might be better for some of us if we could.

It seemed to us rather important that we could shorten this survival time of an animal after the removal of its adrenals, say, to a period of fifteen minutes and not have to wait twelve or twenty-four hours for it to die. The longest time any of them have survived is a

day and a half. There are so many of them, I am not perfectly sure of the figures, but the time was of that order of magnitude.

That is about as far as we have gotten, and, thinking the matter over here this evening, I can see that there is enough to keep me busy probably for the next generation, working out some of these matters in detail, but I suspect that somewhere in our work there are conditions which we haven't yet taken into account, which are causing these discrepancies. Where they are, I don't know, but I don't feel like talking about them now. The safest way by far, I think, is to go back to the laboratory and interview the cat about it. The response, I think, would be far more trustworthy than anything I might say tonight.

DR. WALTER TIMME said it would be a task of intrepidity, if nothing less, to enter into the domain that has been opened to us this evening by Dr. Cannon and by Dr. Pike. The general proposition is that the physiologists, while they are rather accurate in the work they do, nevertheless don't agree among themselves as to observations or conclusions even from the same observation. Neurologists are not very much worse off than they. We travel, perhaps, a little faster; I don't know that we get much further. And so the subject is left as Dr. Pike more or less left it. No one can present the subject and his observation in better fashion than Dr. Cannon, and there is no one whom I have ever heard discuss the subject, who can do it to better advantage. Why some of our representative journals should so espouse the cause of Drs. Stewart and Rogoff as they do, always to the detriment of Dr. Cannon, never even allowing a decent response to appear, is not clear to me. Dr. Stewart just at present has the floor in this country on the subject of adrenalin, and it is rather a lowly rôle in human life, life in general. I don't understand why that should be. To me it seems that Dr. Cannon's work is not destructive but constructive. Stewart and Rogoff seem to be quite destructive. So that for the present, and I hope for the future, I and all of us will be able to bear with Dr. Cannon in his further work.

I should like to ask some questions regarding this matter.

First of all, will stimulation of the sympathetic nervous system or a portion of it, or of a peripheral nerve, produce an increase in the adrenalin content of the blood? Secondly, if it be granted that adrenalin in the blood stimulates the sympathetic nervous system (and I think that has been proven) we are immediately confronted by this condition: A condition of unstable equilibrium in which adrenalin stimulates the sympathetic, the sympathetic stimulates the adrenalin production, and so we go on with a constantly increasing production of adrenalin, until finally, if the production went on ad infinitum, exhaustion would ensue. There must therefore be an inhibitory mechanism which automatically must bring that process to cessation, or else we would all succumb; as a matter of fact, we do in certain instances succumb to the stimulation of the adrenal medulla by means of thyroid activity. The administration of thyroid in a susceptible individual will produce syncope, due, in all probability, to exhaustion of adrenals through that administration.

Dr. Cannon has explained that a place for these reactions is probably in the thalamic region. That perhaps is the old brain region of affective motor control. There must be a higher center in the brain which, through its stimulation and its emotions, controls this lower center, and, although Von Monakof hasn't definitely pointed out such pathways, I have wondered whether since his time physiologists such as Cannon have had any experience in their laboratory with the physiology of those pathways?

Dr. Pike made the statement, which had been made previously a number of times, that the activities of all organs, and especially of the internal secretory organs, could be enhanced or produced not only by one method but by many. That leads me to this statement which I would like to make: That a great deal of the outpouring of adrenalin and of thyroid secretion is perhaps not due to nerve current at all but due to direct massage, just as he explained, experimentally, it could be produced. Deep breathing, ordinary respiration, with the movement of the diaphragm downward, compressing the abdominal organs, in itself has the mechanical and physical effect of producing and of releasing into the circulation a certain amount of adrenalin. So that massage (physical causes, as well as electrical ones) will suffice to produce the secretion.

Then there is a third one, a direct chemical effect, as has been shown a number of times, I believe, especially in the frog's heart removed from the body. A frog's heart removed from the body will beat rhythmically for a certain number of hours, if properly maintained in the proper fluids; but if a little thyroid solution be added to that, the number of hours in which that frog's heart will beat rhythmically will be enormously increased. The direct chemical effect, therefore, besides the physical, besides the electrical, is an element of the production of the internal secretory flow into the circulation.

I want to thank Dr. Cannon extremely for what I have learned through his demonstrations and presentations this evening.

DR. ISRAEL STRAUSS: I would like to ask a question also. Dr. Timme has made a statement here that, in cases of certain individuals, if you administer large doses of thyroid, you may get syncope, and that that is due to extra excretion of adrenalin, due to exhaustion of adrenalin. I want to ask Dr. Cannon if there is any physiological proof of that? In other words, I have noticed that Dr. Cannon has shown on his charts that when adrenalin is introduced, the activity, through thyroid, is increased. I believe that is what the chart shows. But he hasn't shown us (I don't know whether he has done it) whether increased administration of the thyroid has any effect upon the adrenal.

It is just such physiological facts that are necessary to us clinicians before we can deduce from the clinical observations anything that can rely on physiological function. I believe it is that lack in some cases (if it is a lack) in our treatment of the glands of internal secretion in our clinics, and in our therapeutists' efforts in these cases where we assume there is a disturbance of internal secretion, of

physiological basis or of facts proved by physiologists, that has brought us under criticism in journals recently, and has opened us up to an accusation of so-called "loose thinking."

You may recall that Dr. Cannon, in the beginning of his remarks, used the words "loose thinking" in regard to this whole field of internal secretion, and I am very anxious to know if Dr. Cannon has in his work, or if he can quote work which will show definitely, without any question, that the thyroid secretion given to an animal can influence the adrenal as he has shown the adrenal can affect the thyroid.

I also wish to thank Dr. Cannon for the excellent paper which he has presented to us tonight.

DR. STEWART PATON of Princeton said he would thank Dr. Cannon for the great pleasure and stimulus he had received. Dr. Cannon does not need to be reminded that we have a very excellent opportunity of studying these archaic reactions in the embryo of all the higher vertebrates. I feel that my opportunity has come, because I have been repeating for a number of years that somebody with Dr. Cannon's capacity for conducting experiments should try and correlate the functions of the embryo in relation to the development of the nervous system.

As I have said before this Society, the thyroid comes first into the circuit and then the adrenal; and I was very much interested to hear Dr. Cannon speak about the abundant supply of the adrenal. That is my feeling, and still I would like to keep the question open.

I was also glad to hear him refer to the center for the nerves that supply these organs, the corpora quadrigemina in that region. From the long fasciculus which develops in the embryo, you can trace the nerve supply down to the thyroid and you can trace that fasciculus, getting down very much later to the adrenals, at least comparatively speaking; so that the thyroid comes into the circuit quite a good deal ahead of the adrenals, and it seems to me if we observe the embryo very carefully at this time, that a good deal of information can be obtained in regard to the functions of the thyroid and the adrenals in relation to the nervous system.

I was glad to hear Dr. Pike say a word about the nervous system, because I do know a physiologist, a friend of mine, whose attitude toward the nervous system is very similar to that of an English clergyman I met, who asked me what I was working at. I said, "The brains of a fish." He said, "Do fish have brains?" I said, "Yes." He said, "By Jove, that's quite an idea!"

DR. CANNON: Dr. Pike's description of the discharge from the adrenal gland, the evidence at least in the experiments that he and Stewart did together, that there is a storage in the adrenal gland when the blood supply is cut off from the medulla, seems to me to fit in with all the evidence I have presented in regard to the adrenal, in regard to the nerve supply, causing a rise in blood pressure that is well known and developing cerebral compression, for example, and would therefore cause a discharge of impulses similar to that which was illustrated this evening, and a discharge which would result in

an increased output of adrenalin from the medulla and a consequent rise of blood pressure—that rise with a dip, that was pointed out two years ago in an observation that was made in the Harvard Laboratory, and was also noted by Elliott, and later worked out in more detail by Vincent. That disappeared, you will recall, in Dr. Pike's experiments, after the adrenal glands were tied off. In those experiments, after the adrenal glands were tied off, the animals, he said, died sooner than was the case when the glands were not tied off. Now he drew the conclusion that that indicated the importance of the adrenal medulla. I don't believe that he is really justified in drawing that conclusion because when he ties off the adrenal glands, he ties off two glands of the adrenal, the medulla and the cortex.

Then Dr. Timme raised a very large question as to whether the physiologists had any advantages over the clinicians as workers in the realm of science. I think I am not perhaps misstating his remarks; at least, he suggested that inasmuch as there are differences of opinion among clinicians and also differences among physiologists, that they are both on the same plane in that they have differences; but it seems to me that the physiologists at least have this advantage over the clinicians: that they work on material and concern themselves with problems which are capable of demonstration and capable of being inquired into under conditions which are more or less controllable.

For instance, take the question that Dr. Strauss referred to in Dr. Timme's remarks, the question of syncope being due to exhaustion of the adrenal because of feeding the thyroid. Now, it seems to me that there are a number of wholly unwarranted assumptions in that statement. In the first place, it is possible to remove the adrenal gland from animals, both adrenal glands from animals, and they will live for hours. We have had them live for three or four days, with no drop of blood pressure whatever. It is a very common assumption that the adrenal medulla is necessary for the maintenance of blood pressure. Now, that is not at all a demonstrated fact. In all probability the fall of blood pressure that occurs finally after removal of both adrenal glands is a consequence, possibly, of the removal of the adrenal cortex rather than the medulla; a general weakening of the whole animal. At least, it is possible to remove practically all of the medulla from the adrenal glands, leaving the cortex, and the animals will survive for a long period; and then on removing whatever is left, they promptly succumb. I do not know of any evidence that the feeding of the thyroid does produce any exhaustion whatever of the adrenal medulla. In other words, the feeding results in an increase in the size of the adrenal glands, and, as I showed you this evening, that involves both the cortex and the medulla. So that we are at least capable of trying out these matters and getting at the evidence under conditions which are, I think, more largely under control than is the case in practice on the human being.

So far as the difference between Dr. Stewart and Dr. Rogoff and myself is concerned, that is a matter of getting out the evidence. After this evidence was obtained, I was kindly invited to go to Cleveland and speak to the Cleveland Academy of Medicine, which I did

in May, and presented this material, and Dr. Stewart listened to it and did not offer any constructive criticism, and I do not see that he has very much to do except to find out now what is wrong about his own experiment.

As I told you earlier, most of this material is not yet published. The work on the adrenal gland will come out in the December number of the American Journal of Physiology, and I hope that when that evidence is before investigators it will be convincing. I am ready to demonstrate any point that I have made here this evening, at any time, to any group of physiologists or other interested people, so that if there is any question in any of your minds as to whether this evidence is on the same basis with clinical evidence, you can take at least that method of discriminating between two types of evidence.

There is another point that Dr. Timme brought up, and that is why we didn't get into a regular cyclone of sympathetic activity, because the sympathetic stimulates the adrenal, the adrenal stimulates the sympathetic, and so the circle goes, until we wind up in a catastrophe. Well, that might occur if the adrenal gland were subject to adrenal secretion, but there is no evidence that it is, and there is quite a bit of evidence that it isn't. It has a peculiar nerve supply; it isn't innervated by the sympathetic as the blood glands are innervated by the sympathetic. So that the possibility of a vicious circle being started is not present, and, as the record showed this evening, after an afferent nerve is stimulated or the splanchnic nerve is stimulated, the heart rate goes up promptly, beginning about eleven or twelve seconds, and in perhaps a minute and a half after the stimulation has ceased, the heart rate is down where it was before. In other words, this vicious circle doesn't occur, and it doesn't occur because the secreted adrenalin does not in turn stimulate the secreted cells to produce more adrenalin.

With reference to a higher center for emotion than those which are found in the thalamic region, I should like to have more evidence. It seems to me that the observations of Head and Holmes were extremely interesting observations, and if you will recall that the study of their cases indicated that these individuals had an exaggerated affective accompaniment of all sensation, just in so far as the evidence indicated that this thalamic center was disconnected from control by the cortex, and they suggested that here was a mechanism in the thalamic region already for expression of affective states of emotional experience and that it was inhibited by the cortex, and that when the cortical inhibition was removed, this lower center then had full freedom of expression. The experiments of Sheridan and Woodworth and also the observation of Goltz indicated likewise that this lower mechanism was quite adequate at least for the expressions of intense emotion such as rage, or possibly fear, certainly the aspect of attack is shown by these animals quite apart from any play of the cortex, because the cortex has been wholly removed.

A motion that a vote of thanks be granted to Dr. Cannon and Dr. Pike for so kindly coming to speak before the Society was unanimously carried.

Current Literature

III. SYMBOLIC NEUROLOGY

1. NEUROSES-PSYCHONEUROSES

McPherson, G. E. NEUROPSYCHIATRY IN ARMY CAMPS. [Boston Med. and Surg. J., November 20, 1919.]

The broad application of this specialty in the examination and care of soldiers was introduced after the inauguration of the draft and over seven hundred specially trained men served in this section of the Medical Corps. Early doubts, often expressed by officers as to the value of such examination were soon dispelled, so that psychiatrists were generally regarded as great aids in the solution of soldier problems. The belief that every man who had been able to perform a certain class of work in civil life could therefore render equivalent service in the army proved untrue. It was difficult for many men, especially the mentally deficient, to adjust themselves to the many and strict requirements of army service. The importance of the work may be emphasized by figures: in five months in the summer of 1918 54,000 recruits were examined at Camp Upton, New York. Of this number 1,050 or 2 per cent. were rejected for nervous and mental disorders. At Camp Gordon in four months of the same year 58,850 men gave a rejection of 1,225 or 2.8 per cent. for similar diseases and conditions.

The Conscientious Objector.—In some of the camps he refused to do a stroke of work, wear a uniform, or participate in any way in the activities of camp life. These men became a great problem. No doubt many of them were "queer." Some of them were undoubtedly psychopathic personalities. The great number were not sufficiently psychopathic to escape responsibility for their actions. Nothing could be done with the majority of them except to put them under some form of restraint where their propagandist activities were limited.

The Drug Addict constituted 17 per cent. of the total rejections because of nervous and mental disorders. They were poor material and with the exception of a few recently recruited drug users they were of too poor material to be kept in service. The drug habit was confined almost entirely to recruits from the cities. While one would expect the majority of the epileptic cases to have been eliminated by draft boards, it is true that large numbers entered the service, especially by voluntary enlistment, early in the war. At Camp Upton rejections for this cause made up 3.5 per cent. of those rejected because of nervous and mental disorders. Mental deficiency contributed 30 per cent. of our total rejections or about .6 per cent. of all recruits examined. These men offered a serious problem, as those in authority were disinclined to excuse from

army service a man who looked healthy and strong. No other class of men made so much mischief in the Army as did the feeble-minded. The psychological examinations conducted in concert with the psychiatric aided in weeding out men of this group. Defects in fields other than intellectual were the exceedingly common cause of soldier problems. Much that was reckoned as criminality or insubordination can be charged to the mental deficiency of these soldiers. In the camps the psychotic cases were present in limited numbers, largely dementia praecox in character. A few cases of acute alcoholic hallucinosis and a considerable amount of neurosyphilis were also observed.

There were many men accepted for service only to become very unhappy and a source of great concern because of their constitutional psychopathies. Emotional instability, inadequate personality and sexual psychopathy provide the subdivisions under which the majority of such psychopaths were classified. An amazing story could be written of the psychoneuroses of recruits. Enuresis, hysteria, neurasthenia, stammering, etc., furnished causes for many rejections.

It became common practice to examine prisoners, especially those committing major offenses, with a view of determining their mental responsibility. Many men requiring constant guard proved to be mentally deficient or psychotic and were often kept in army service when they should have been early discharged. The experience of psychiatrists in the army indicated that there is a tremendous amount of work along neuropsychiatric lines to be done every day in civil life. [Author's abstract.]

Bury, J. S. PHYSICAL ELEMENT IN PSYCHONEUROSES. [Lancet, July 10, 1920. Med. Rec.]

Judson S. Bury, confining his remarks to genuine cases of the neuroses, holds that the difficulty in discriminating between malingering and a true neurosis is very great, and one is apt to be biased by personal feeling toward the patient. True malingering—that is, conscious simulation—is rare. It is, however, often combined with true hysteria, or unconscious simulation, and it is such combinations that lend themselves most readily to dramatic cures. The writer deals with the underlying physical basis of the neuroses, because there seems to be a tendency to lay undue stress on the psychical factor. At any rate, it seems unlikely that molecular disturbances of the nervous system and altered blood states largely account for the long duration of many cases and for the great tendency for symptoms to relapse on the slightest provocation, whether that be undue exertion, loud sudden noises, or family or business anxieties. In the most common type of case better results will be attained by fresh air, sunlight, cheerful surroundings and light work than by continuous searching for a hidden mental conflict. Of the value of psychoanalysis in certain intractable cases where there are reasons for suspecting a repressed memory or complex, Bury does not attempt

to express an opinion. Nor is he tempted to undertake the necessary investigations when he reads that a three years' study of the subject is essential, and that to unravel a complex, to trace some of its elements back, possibly to some incident in childhood, often a very muddy one, may occupy the constant attention of the psychoanalyst for at least several months, and sometimes for a year and even longer.

Bowman, K. M. MENTAL AND NERVOUS STATES AND MILITARY EFFICIENCY. [Military Surgeon, June, 1920.]

The author here discusses the relation of defective mental and nervous states to military efficiency, and states that there are in the United States a large number of cases of mental or nervous disease or defect. This is shown by the fact that, out of every twenty men rejected in the draft, one man was rejected for mental defect and one man for mental or nervous disease. During the war every army had large numbers of cases of mental or nervous disease which markedly impaired the efficiency of the fighting forces. To secure the most efficient army possible, it is necessary to eliminate the mentally unfit as soon as possible, but to use available cases of mental or nervous disease or defect whenever possible and where best fitted. To eliminate the mental defectives, the best way is to use the group examinations given by the psychologists to recruits. Such an estimate was perfected and used in our own army and is satisfactory. Borderline cases, depending on their mental age, their physique and disposition may be fitted for service. The majority of cases with a history of a psychosis are unfit for military service. Those offering the best prognoses are: manic depressive and infective exhaustive psychoses; acute alcoholic conditions, *per se*, are not a bar to service; chronic alcoholic conditions, if pronounced or with paranoid tendencies. Especially should it be guarded against allowing arrested cases of dementia praecox and paranoia from entering the service. Every case must be judged on its individual merits and by a trained board of psychiatrists. Of the psychoneuroses, all extreme cases are unfit for service. Psychasthenia and anxiety neuroses are the worst types; hysteria and neurasthenia are the best. Because of the high intelligence of many psychoneurotics they are valuable individuals, and should be used, preferably in noncombatant service. The conscientious objector and the malingerer are frequently cases of mental disease, and, if so, should be treated as such; if not, they should be rigidly dealt with. To prevent nervous and mental diseases from occurring, the method used by our army in France is to be commended—and the method of treatment used is as good as has been devised. The public should be educated toward a truer understanding of the war neuroses in an endeavor to prevent their occurrence. In the future our army will be benefited in mental health and efficiency if the general education in the country is raised and English is universally known; if a program of

general mental hygiene for the country is adopted; if syphilis is prevented and properly treated, and if a system of universal military service is adopted.

Stoddart, W. H. B. PSYCHOLOGICAL ANALYSIS. [Seventy-ninth Annual Meeting of Medico-Psychological Association of Great Britain and Ireland.]

Stoddart, in a summary of Freud's psychology, said that an unpleasant memory was not thrown away into space, but could be revived by such processes as hypnotism and psychoanalysis. The driving of unpleasant thoughts deeper into the mind ("repression") was an automatic protective mechanism. A constellation of repressed ideas was known as a "complex," and inhabited the unconscious mind; a desire which had been banished from the conscious was constantly striving for recognition and gratification. As the conscious would not allow this, such gratification must be achieved in a distorted guise: it was sublimated in various activities. If the patient did not remain normal, he gratified his complexes by the creation of symptoms. Neuroses, psychoses and dreams were fundamentally the same, the only difference being that the neurotic or psychotic lived his dream. Freud held that forgotten infantile desires and interests remained permanent throughout life, and that many adult activities owed their energy to primitive infantile impulses; any neurotic or psychotic manifestation among members of the family, especially the father or mother, had a profound effect on the mental development of the child. With regard to the sexual problems, Freud did not really extend the application of the word "sexual" to the young child; he merely recognized certain infantile activities to be of a sexual nature because, if they occurred in an adult, they would be regarded as sexual by everybody. Probably Freud was right when he said that nobody was quite ideal sexually; hence repression achieved the force of an inborn instinct. It should be remembered that in psychoanalysis the analyzer said nothing; he only encouraged the patient to unfold his own story.

Todde. COMPLETE ALOPECIA OF EMOTIONAL ORIGIN. [Rif. Med., April 17, 1920.]

A man, aged 34, following emotional shock during war strain developed a complete alopecia which had failed to recover. The whole body was affected, starting with the uncovered parts and then going on to the covered areas. There was some slight enlargement of the thyroid and mild exophthalmos with moderate tachycardia (pulse 120 in the erect posture, 10 lying down). Romberg's sign was absent. The treatment suggested is by pluriglandular opotherapy.

Christides. PSYCHIC INHIBITION OF MENSTRUATION. [Rev. fr. de gynécologie, February, 1920. Med. Rec.]

Psychogenic suppression of the menses exists but is much overlooked. Deluis once published notes of 60 cases. Christides here adds a case

of this sort. The young woman was aged 28 and presented a history of renal crises with anuria, passage of calculi and hematuria. After several of these crises her menses ceased. Placed under observation she went through one of her attacks of renal colic, accompanied this time by symptoms of acute appendicitis which was operated. The surgeon examined the urinary passages and four weeks after the appendectomy performed an operation on the kidney, the details of which are not given, but it was evidently only a capsulectomy for the relief of intrarenal tension. A new renal crisis followed. Suspecting a psychogenic factor the subject was psychoanalyzed and a study of the supposed calculi by a pathologist revealed that these were clots. It was learned that a certain degree of purulent cystitis was present and stimulation was at once suspected. During the period of internment the menses were almost but not quite suppressed, although a marked menstrual molimen was present. Psychoanalysis failed to clear up the situation entirely, but the woman improved and her menses returned, with cessation of the renal crises. The case was not fully clarified, but apparently there had been a suppression of menstruation in a profoundly hysterical subject, with a molimen which was severe enough to simulate a renal crisis. The appendicitis must have either aggravated the state of affairs or was another displacement mechanism. Either when fully conscious or during a hypnotic state the woman introduced into the bladder some foreign objects which simulated calculi or clots and set up a gaseous cystitis, thus adding notably to the picture of renal colic.

Hurst, A. F. PSYCHOLOGY OF SPECIAL SENSES AND THEIR FUNCTIONAL DISORDERS. [Lancet, July 31, 1920.]

Hurst here states that hysterical pain is very real and cannot be distinguished from pain caused by somatic disease by its subjective character or by the absence of associated sympathetic phenomena. It may give rise to dilatation of the pupils, tachycardia, pallor and sweating, if the original organic pain did so. His rather superficial explanation is that the afferent reflex paths involved offers little resistance to peripheral impulses.

Surmont, H. NERVOUS ANOREXIA. [Médecine, July, 1920. J. A. M. A.]

Surmont appeals to the general practitioner to be on the lookout for nervous anorexia; lacking proper treatment it may entail serious disturbances. This usually monosymptomatic neurosis is encountered at all ages, even in infants and in the aged, in both sexes, and in all classes of society. It is frequently liable to be mistaken for cancer, pernicious anemia, diabetes, suprarenal insufficiency or pulmonary tuberculosis.

Hurst, A. E. PSYCHOLOGY OF SPECIAL SENSES. [Lancet, July 24, 1920. J. A. M. A.]

The author here reiterates the well known and superficial Babinski formula to explain hysterical symptoms.

Cobb, S. ELECTROMYOGRAPHIC STUDIES OF MUSCLES DURING HYSTERICAL CONTRACTION. [*Am. Arch. Neur. and Psych.*, July, 1920.]

Laboratory evidence is brought forward by Cobb that the involuntary muscular contractions in hysterical conditions are physiologically similar to normal, conscious muscular contractions. The short, repeated, hysterical contractions that clinically resemble tremors can be differentiated electromyographically from such a tremor as that of paralysis agitans, or from clonus, by their slower rate and greater irregularity. [*J. A. M. A.*]

Bergson, H. FREE ASSOCIATION AND ITS RIGHT TO USE. [*Ed. N. Y. Med. J.*, November 27, 1920.]

The use of free association in psychoanalytical therapy meets with familiar forms of criticism. There are some who boast an intellectual modesty, which has, however, a stale odor of intellectual and moral laziness. To them any feature of the psychology of the unconscious seems too deep, too obscure. Others, with a more openly acknowledged superciliousness, consider the seemingly random memories brought into view by free association too trivial for serious technical attention. Would it aid in obtaining a truer valuation of the patient's free associations and of the method which deliberately makes use of them, if a psychological appraisal could be found for both classes outside of psychoanalysis? Perhaps such an estimate would also throw light where the employment of such apparent vagaries of memory seems too obscure a procedure. Bergson never laid claim to being a psychoanalyst. The matter of his Mind-Energy was written or spoken independently of the teachings of Freud. He has a fondness, nevertheless, for delving into psychic facts and a keen sense of the practical implication of psychic actualities in each moment of life.

Bergson has already made classic the statement that the function of the past, store din memory, is to illuminate the present moment, to direct and further the action at hand. The task of mental therapy is surely the freeing of memory to such service, memory that has been too long held back—repressed. In order to release energy at such a point, energy painfully caught and held in the repressed matter, is it effective to turn upon the situation the logic of intellect? Is any patient ever reasoned out of an incessantly haunting obsession, compulsion, phobia?

Bergson suggests a different sort of light. He says that memories are recalled "in order that the circumstances which have preceded, accompanied and followed the past situation should throw some light on the present situation and indicate the way out of it." Bergson is talking of memories which flood upon a new perception but it is not amiss to apply his appreciation of the service of memories to such a particular point, the blocked up issue which has appeared like a new perception in a dream phenomenon or a stubbornly unchangeable one in a symptom. This philosopher-psychologist at any rate finds room in

theory and practice for a thinking process which reaches in two opposite directions, and counts each of equal dignity. Thought forms and follows a directed scheme but this is meaningless, yes impossible, unless there is "a descent of the scheme toward the image, and a moving of the mind among the images themselves." A careful reading of Bergson's chapter on Intellectual Effort convinces the reader that to this thinker at least all intellection makes use continually of the method of free association. There is no word either of exclusion on the ground of triviality or any other quality. The only criterion of selection is serviceableness to the matter in hand.

Johnson, W. ACUTE CONFUSIONAL STATES IN PSYCHONEUROSES. [Jl. Neurology and Psychopathology, I, 2, 1920.]

According to this observer the cases appeared to group themselves into three fairly distinct types: (1) simple type with short confusional period; (2) severe type with pronounced, but temporary, state of confusion; (3) type associated with definite mental disorder. The majority of cases fell into the first group.

Mörchen, Friederich. UNFITNESS AND NEUROTIC REACTIONS OF DEFENSE IN INFERIOR INDIVIDUALS IN THE WAR. [Zeitsch. f. d. ges. Neurol. u. Psychiat., 1919, No. 44, p. 340.]

There is no diversity of opinion concerning the neurosis problem and defense reactions, whether they be judged from a psychological (psycho-analytic) or biological point of view. The fundamental forms of nervous and psychic defense reactions are not considered pathological and the concept of disease in this reference is restricted to some complicated or especially pronounced instances. The tendency to defense reactions of the same character is peculiar to all psychically inferior personalities. Following a fundamental biogenetic law the same mode of defense reactions are found in animals of lower species and in children and under certain conditions the inclination to nervous and psychic reactions of this nature may appear as an atavistic function in persons who are normally developed, mentally and physically. Very remarkable is the regularity and uniformity with which the reactions of defense occur whenever a large number of underdeveloped individuals find themselves simultaneously in the same psychic situation. Essential conditions for this affect reaction are extreme emotional tension, a peculiar condition of the reflexes below the threshold, and the power of heightening both, voluntarily and purposefully, up to the point of setting into activity a special mechanism of defense of psychic or nervous nature. This primary measure of defence is connected with a secondary one, *i.e.*, the flight from the responsibility for having set the mechanism in motion. For this there is a further mechanism made use of by inferiorly developed persons, corresponding to a general and normal psychological tendency to repress sensations which arouse the feeling guiltiness. This mech-

anism has an outcome the objectivation of the defense reaction to a disease, that is, there arises the autosuggestion that the subject is suffering from a disease. The constantly present effort of individuals in a state of primitive development to withdraw from adaptation to a higher social level must be greatly reinforced in war with its heightened and all-embracing demands on altruistic feelings and for reasoning subordination. In consequence it is found that what are known in peace times as compulsory neuroses and "refuge in psychoses" (the protective measures of inferior individuals in the form of reflex, psychomotor and autohypnotic mechanisms of biologically primitive sort) make their appearance in their characteristic forms much more frequently than under ordinary conditions. The World War had aroused the instinct of self-preservation to a degree never before heard of. The natural reaction of the nervously and mentally weak when they feel their helplessness against the painful and anxious affects which confront them is refuge in regression to a primitive or infantile mechanism of defense, in the war resulting in the hysteria of the masses in a form never hitherto encountered, modified as it was by the present cultural level. By contrast, the unfitness of the inferior individuals who give way under the stress sets off strikingly the psychic and nervous resistance of the surviving fit of the people, who had attained the higher levels of evolution. [J.]

Brunschweiler, H. A CASE OF PHYSIOPATHIC DISTURBANCES. [Schweizer Archiv. f. Neurol. u. Psychiat., 1920, Vol. 6, No. 2, p. 253.]

The author believes that the nervous reflex mechanism furnishes the most plausible explanation for a large number of disturbances about which little is known, or, rather, about which much is known clinically but little from an etiological point of view. Following the originators of the expression *physiopathic* he uses the term to describe conditions which are not due to hysteria nor to any other psychopathic state, but which, on the other hand, do not correspond to nervous lesions discoverable by means at present at the disposal of science. He discredits accounts of cures of cases of this nature by psychotherapy exclusively, and reports a case which he believes illuminating, interpreting the successful therapy applied. This was the case of a man who had been bitten in the left hand by a horse suspected of tetanus. It was impossible to examine the patient immediately after the injury and a Bier bandage was placed above the wound, which, proving ineffective, was soon removed. Medicated and hot applications were then used, but without beneficial results. Finally ice was applied and the hand almost immediately swelled to an enormous size. After three years, in which there was no improvement of the hand, the patient came to the author's attention with the diagnosis of syringomyelia. At first view this diagnosis seemed probable, for paraplegias and contractures of the lower limbs from which patient was suffering seemed to indicate the existence

of trophic disturbances and a lesion of the pyramidal bundle, conditions which are entirely characteristic of syringomyelia. Careful examination of the reflexes, however, revealed no signs of degeneration and the electrical reactions of the muscles were normal, thus excluding syringomyelia and all other anatomic lesions of the medulla. Nor could lesions of the nerve trunks or nervous centers be assumed. The author at first thought that the paraplegia might be due to disturbance of psychic origin, but became convinced that the affections of the left arm resulting from the horse bite (enormous swelling, hard edema, decalcifications, loss of power of movement), though their topography did not correspond with the areas belonging to the nerve trunks (ulnar, etc.) of the arm, were from the same cause as the palsies of the lower extremities. For the affections of the hand and arm the hypothesis of a psychopathy could not even be taken into consideration, for if such disturbances can be attributed to hysteria it would no longer be "that disease which does not pass the bounds of suggestion and of which the symptoms can be produced at will" (Babinski). Forced finally to the conclusion that the disturbances were of physiopathic or nervous disturbances of reflex nature, the author undertook a therapy in keeping with this view. After three treatments with extremely violent faradic currents together with intense psychotherapy (because the extreme degree of functional impotence only seemed partly explained by the assumption of an organic affection) patient was able to walk in nearly normal manner. What rôle the psychotherapy played in the cure the author is unable to decide. In the treatment of the arm he made use of a fact discovered by experiment, namely, that warm baths applied to the sound arm caused vasodilatation in the diseased arm. Hot baths were therefore regularly administered and after six weeks the swelling of the diseased arm was greatly reduced, the decalcifications had disappeared and patient was able to use the member almost normally. [J.]

Herzig, Ernst. EVENTUAL WAR PARALYSIS. [Wien, klin. Woch., 1919, No. 50.]

Observations on three hundred and sixty histories of patients received between August 1, 1914, and August 1, 1918, at the Austrian institute, Steinhof [Vienna], all of whom were paralytic soldiers, lead the author to undertake to answer the following five questions:

1. Have war experiences any demonstrable influence upon the causation of the paralysis? To this the author says that his figures cannot be used as criterion since the patients received during this period are drawn from a wide territory instead of being local as in the prewar days.

2. Have the experiences just gone through produced any shortening of the interval between luetic primary effects and paralysis? A latency period of 13.7 years is the answer to this.

3. Has service at the front had any such effect? This could not be determined from the patients, since these were usually psychically dis-

turbed and their information could not be depended upon. Some fabricated purposely either from shame, or to get sick benefits.

4. Is there such a thing as War Paralysis [Weigand's]? Dr. Herzig's observations gave him no support for the existence of a war paralysis in the sense of Weigand (rapidly fatal).

5. Have the war experiences and events given the paralysis a wartime coloring? The author concludes that in general no special wartime coloring can be detected, although in light beginning stages of paralysis such a coloring has been noted temporarily.

It has been repeatedly emphasized by various authors that psychiatric knowledge has derived no qualitatively new material from war experiences. This is the opinion of Dr. Herzig also. Especially in regard to paralysis has this been found to be so. [Author's abstract.]

Myers, C. S. HYPNOTIC TREATMENT OF A CASE OF NARCOLEPSY. [Lancet, Vol. CXCVIII, pp. 491-493, 1920.]

There are two ways in which hypnosis may be employed in the treatment of the psychoneurosis: (a) for suggestion, (b) for exploration. Hypnotic suggestion, like other forms of suggestion, merely substitute certain motives for a contrary action to that which it sets out to cure. It is therefore comparable to a counterirritant, whereas exploration—a more appropriate and wider term than analysis—attempts to probe the cause to its very origin, resting on the belief that repression and dissociation are at the root of the disorder and that reintegration alone can effect a permanent cure.

These latter principles I have applied successfully to a case of narcolepsy in a young Air Force officer, which came under my observation. It was reported to me that his sleeping attacks were sometimes ushered in by paroxysms of terror in which he spoke Malay and assumed a defensive attitude of the upper limbs. A certain amount of explanation was obtained from the patient in the waking state after great difficulty, but as time pressed and the patient could not be induced to recall the whole occurrence, recourse was had to hypnosis. In *two sittings*, not only the memory of the entire scene of his attack by an orangoutang in Borneo was revived, but also the origin was revealed of his previously elicited fears of being in the dark and of his visual hallucinations of the face of a Chinaman appearing at the window. These were respectively traced to an incident when he was only four years old, and to an exciting experience connected with a murder on a ship.

Now the orang and the ship experiences had never been revived in the patient's consciousness (so he maintains) from the day of their occurrence until he was hypnotized. Posthypnotic suggestions were given him that he would retain the memories thus revived and that he would be able to face them with equanimity. A striking and immediate relief followed the resuscitation of these memories. Instead of being, as before, a relatively useless member of society, he has now been for several

months receiving training in an engineering works. He has felt, to use his own words, "both mentally and physically different," and has been practically free from attacks of narcolepsy.

A striking feature of the case is that the lost memories were recalled without the exhibition of any emotion. It thus offers no support for those who claim that repression (inhibition) of the emotions is the prime cause of the psychoneurosis. I suggest that it is the *unpleasant scene* that becomes directly repressed, while the emotional component becomes merely dissociated, without suffering repression, and, free to express itself as best it can, manages by well known devices to manifest itself in consciousness.

Revival of repressed memories is, as everyone knows, easiest when the "censor" or "repressor" activity is at a low ebb, *e.g.*, in a state of reverie or dreaminess, than which light hypnosis is to be regarded as only slightly intenser in degree. If only its nature can be satisfactorily explained to the patient and due care be taken to dispel all ideas of mystery about it and of later reliance on the hypnotizer, there seems no reason why hypnosis should not, in a certain proportion of cases, successfully replace the slow piecemeal procedure advocated by the psychoanalyst. [Author's abstract.]

Euziére, J., and Margarot, J. THE REACTIONS OF THE VISCERAL NERVOUS SYSTEM IN ANXIETY STATES. [L'Encephale, 1920, June, Vol. 15, p. 361.]

The author states that French writers have clung to a clear and precise clinical idea concerning anxiety syndromes in striking contrast with the psychology of the followers of Freud whose views are sometimes far-fetched and obscure. Various researches have shown the existence of morbid phenomena due to disturbances of the sympathetic system, but these symptoms have not as yet been separated with sufficient definiteness from those due to disturbances of the antagonistic autonomic system, and it is found that where the two systems form complex associations the subjective manifestations are also very complex. Taking up the manifestations of anxiety the author states that they may be divided into two groups, those obviously accompanied by physical disturbances, as cardiovascular disease, and those which seem to be limited to psychic complexes. The quality of these sensations of anxiety cannot be exactly expressed in words, but they may be considered as emotions characterized by a painful mental state resembling uncertainty and insecurity. The greater part of the psychic and physical manifestations of anxiety, the close interdependence of which is obvious, is explained by the hypothesis of an exaggeration of the activity of the sympathetic system although there are a certain number which are connected with the autonomic or motor systems. For these symptoms originating in the autonomic system, as for example lachrymal secretions, a possible explanation may be found in the fact that there is a reaction of the autonomic

system to counterbalance the exaggerated activity of the sympathetic. Disturbances of the motor system are immobility, contractions of striated muscle, etc., but all these phenomena accompanying anxiety states are secondary to the dominating disturbances of the sympathetic system. Usually the anxiety is not a continuous condition, but recurs with more or less frequency in the form of paroxysms. The author describes various cases of psychoses and psychoneuroses which may be accompanied by anxiety states. He divides the cases into two groups, those with permanent syndromes of anxiety and those in which anxiety or physical anguish occupy a secondary place. Referring to the relation of the objective manifestations to the subjective phenomena, the author, without going into the question as to which of the two elements always found associated, the mental anxiety and the exaggerated activity of the sympathetic, is the primary one (involving the problem of the peripheral or central origin of the emotions), calls attention to several noteworthy facts which have been established by recent experience, namely, that different individuals react differently to certain excitations and that the origination of anxiety states is closely connected with the existence of peculiar temperaments or disturbances of nervous equilibrium referable to various causes but essentially characterized by a predominance of the activity of the vegetative system over that of the autonomic. The sympathetic hypertonia is closely connected with certain endocrinal secretions, particularly those of the suprarenals and a hyperfunctions of these glands is present in a large number of cases of anxiety. In the author's opinion the distress in place of being a somatic condition derived from the anxiety, is, like the latter, a translation of a sympathicotonic condition. The activity of the sympathetic may be of psychic or somatic origin, but it always precedes the specific feeling. The knowledge of these parallelisms and relations is not of theoretic interest solely, but furnishes very important therapeutic indications which promise good results in the near future, in the treatment of these mental diseases.

Strohmayer, Wilhelm. SEXUALITY IN THE GENESIS OF CERTAIN COMPULSORY NEUROSES. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. 45, p. 167.]

Defining episodic compulsory ideas and those which make their appearance periodically in cyclothemic disturbances as distinct from compulsory neurosis *sui generis*, the author discusses the sexual basis of these latter forms. Since the time that Freud called his attention to the subject he has never been able to take any other view than that the sexuality of the neurotic is the symptom-forming force. In all these disturbances it is the opposite factors, sadism and masochism, which are involved, and if the *vita sexualis* of these patients is enquired into, it will always be found that their compulsory ideas rest on phantasies or conduct determined by one or the other, sadism or masochism or a mingling of both (sometimes the information is offered unsolicited).

The author cites cases illustrating what he means by compulsory neuroses as a sadisto-masochistic equivalent. The equivalent of the sadistic urge is betrayed by thoughts of doing injury. The patient is pursued by the thoughts that he has done injury to his fellowmen, maimed them, mistreated them, struck them, etc. As masochistic equivalent are found ideas concerning the patient's own personality, fears for his own safety, indecision, with constant repetition of acts, especially repeated washing, under compulsory pressure. Discussing the manner in which the sexual perversions lead to the neuroses, the author expresses assent to the well-known theory of Freud that the neurosis is the negation of the perversion, and that the perverse psychic sexuality remains a constant source from which the neurosis is nourished, and, further, that the neurosis in its symptoms follows the character of the perversion. Concerning the therapy, the author believes that psychoanalysis will never succeed in curing these psychoneurotics because the connection between the sexuality and the neuroses is of organic character rather than of psychic. The author believes that all sexuality is primarily organic and only secondarily psychic and he sees no improbability in the view that in these perversions there is a disturbance of the inner secretions and that this dyscrasia leads to the psychic disharmony. [J.]

Springthorpe, J. W. PSYCHOLOGY AND MEDICINE. [Lancet, November 6, 1920.]

Springthorpe pleads for instruction of medical students in psychology. He deems it strange that medical education, with its high standards of requirements and constant effort after extension, remains silent and almost immovable in dealing with man from above, as well as from below—psychologically as well as physiologically. He suggests including psychology in the curriculum of each medical school, the establishment of a psychologic department in every teaching hospital, and drawing the special attention of the medical profession generally to the need for its study and practice in the interests of all concerned. [J. A. M. A.]

Hellpach, Willy. WAR NEURASTHENIA. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. 45, p. 177.]

As was to be anticipated, after the first outbreak of mental disease in the form of hysteria in those who were in condition to succumb to the first extraordinary experience, this form of war neurosis receded and was replaced by neurasthenia, "ordinary chronic nervous exhaustion." War neurasthenia differed in some respects from ordinary neurasthenia and may be divided into two types, the form met with in the field and that encountered behind the lines. The field neurasthenia is characterized by marked loss of memory, especially for former events, loss of interest in the environment, reduction of libido and potency, night disturbances in the sense of increase of dream phenomena, pavor noctis and somnambulism being a classical component of the syndrome of field

neurasthenia. There is also heart neurosis with vasomotor and secretory disturbances. As cause of this form two factors are to be distinguished: physical injuries, as bodily traumas, exhaustion, narcotic over-irritation, on the one hand, and psychological, such as psychic experiences, tension, irritation, etc., on the other. Contrasted with other forms of neurasthenia the age of the victims was remarkable, a very large number of juvenile persons and of preseniles being among those affected. In two-thirds of the cases the clinical development was in the form of repeated attacks with remissions followed by a final collapse. Each case of neurasthenia was found to have an inner critical turning point where the abnormal reaction of the psyche began to become manifest in the physiological structure of the organism, usually first noticeable in a pronounced falling off of weight. Through this so-called progressive course of the disease the diagnosis is rendered grave, but it is nevertheless surprisingly favorable in comparison with the prognosis in hysteria, because the patient has the wish to recover. Rest in the hospital and proper psychological treatment by the physician is the best method dealing with these patients. As cause of the war neurasthenia occurring behind the lines the principal rôle is played by lack of food, lack of rest, psychic tension and irritation. This form is characterized by a peculiar unrest, psychic indecision and total exhaustion of body and soul. Characteristic for both forms is the absence of hypochondria in the symptom complex. [J.]

Christoffel, H. DEPRESSION IN CONNECTION WITH NERVOUS EXHAUSTION IN PARTICIPANTS IN THE WAR. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. 45, p. 261.]

Previous war experiences show a relative rarity of manic depressive insanity. In contrast with this discovery is the frequency of conditions of depression of other sorts. The author presents a small group of patients of this type in whom there was no evidence of previous abnormal condition and who developed a peculiarly colored depression in obvious connection with external conditions. These patients were men of good intelligence in the ages of from 28 to 32 years. The disease began after extreme exertion or immediately following bodily illness. Exhaustion occupied the foreground of the symptom complex; there was full insight; the depression was uniform and obstinate; there was tendency to irritability and explosiveness rather than lability; further symptoms were impatience, lack of interest, indifference to pleasure, abstraction; paranoid traits were slightly in evidence. In conclusion the author states that the fact of an increase of reactive depressions is evidence that the mental and physical hardships and stresses of war may be the essential cause of these conditions. In regard to the rôle of the constitution it may probably be inferred from the fact that the war did not increase the number of cases of manic depressive insanity, that it would also be with-

out influence on a "depressive tendency" and that the constitutional terrain upon which these reactive depressions develop is not a uniform one. [J.]

v. Artwinski. TRAUMATIC NEUROSES AFTER WAR INJURIES. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. 45, p. 242.]

From a great number of neuroses those occurring after external traumas were considered apart, for the purpose of determining whether they are to be regarded as hysterical phenomena or not. The principal symptom of the complex is a atypical paralysis which makes its appearance in connection with trauma, accompanied by vasomotor, trophic, secretory and thermic disturbances. Characteristic for all these phenomena is their dependence on a subnormal temperature; thus in cases where there is disturbance of motility there is, under the influence of cold, greater difficulty in movement and a feeling of resistance, together with cyanosis of the extremities. Further the paralysis is often accompanied by swelling which recedes only slowly and gradually and continues long after the disappearance of the paralysis. The behavior of the vasomotor and secretory disturbances is similar. These are all obviously not of hysterical origin, and are to be considered as reflex, in the author's opinion, standing in absolute causal relation to the trauma. The disturbances of sensibility appear irregularly and for the most part take the form of anesthetics, analgesias, or hypesthesias and hypalgesias. In summing up the author comes to the conclusion that posttraumatic paralysis with the accompanying trophic, vasomotor and secretory symptoms cannot be called hysterical. Only one symptom, the motor, could be included under the all-embracing designation of hysteria. But were it possible to consider the phenomena of traumatic paralysis as belonging to the hysterical group, it would be necessary to assign them a special place thereunder, because they have characteristics clearly distinguishing them from ordinary hysterical disturbances, for instance the dependence on subnormal temperature. The paralytic symptoms, however, cannot be separated from the others because they are all of traumatic origin and must all be regarded as a posttraumatic symptom complex. The motor phenomena are curable by psychotherapy, but only after a certain length of time has elapsed which has not as yet been definitely determined. In speaking of paralysis of this sort it is best to designate it as a functional paralysis, at the same time enumerating the other symptoms belonging to the complex. It differs from hysterical paralysis in that the entire symptom complex cannot be reproduced by simulation, it being impossible to imitate the nonmotor symptoms. [J.]

Gordon, A. PERSISTENT VOLUNTARY MUTISM. [N. Y. Med. Jl., September 25, 1920.]

A boy, aged 13, after reading a story concerning mutism became mute. He had previously been an average boy for his age. Neither argument nor persuasion had any useful therapeutic results.

Roussy, G. PREDISPOSITION AND DETERMINING CAUSES OF SECONDARY DISORDERS IN PSYCHONEUROTIC ACROPARALYSIS. [Am. Arch. Neur. and Psych., September, 1920. J. A. M. A.]

After an investigation of more than 2,000 psychoneurotic disorders these conclusions appear to Roussy to be justifiable: (1) To enable the appearance of vasomotor and trophic disorders, during the course of acrocontractural and acroparalytic manifestations, three conditions are necessary: (a) elements of predisposition and among them circulatory troubles, (b) immobility or defective function, and (c) a special mental state. (2) The circulatory caloric and trophic troubles are only manifestations of a secondary class arising from a primary condition of neuropathic nature, paralysis or contracture. Roussy proposes to designate the whole series of disorders constituting this syndrome "the dyskinetic syndrome, or syndrome of defective function."

Isham, Mary K. A CASE OF MIXED NEUROSIS WITH SOME PARAPHRENIC FEATURES. [New York Medical Record, June 12, 1920.]

This is a contribution to the data upon which the psychiatry of the future will be built; a science which will be concerned with symptoms, but also with their rationale, whose therapy will be the substitution of more nearly adequate reactions. Until we have a sufficiently large number of instances from which to generalize, our efforts in this direction must largely consist of the compilation of cases. Every patient, especially perhaps those of neurotic, psychoneurotic, mildly psychotic and other types, where the pathological emotional distortions have not persisted to the point of such great psychic loss that the reactions are no longer ductile, should be studied and the mechanisms uncovered should be described for the benefit of other investigators. Each such case intelligently studied and lucidly described adds much of value to interpretative psychiatry. In the present paper Dr. Isham has taken the case of a thirty year old musician, married three years, whose complaint was "that he could not live at home with his wife, because he was afraid he would harm his small son and only child, aged fifteen months." His crying annoyed him and yet he would become alarmed over periods of quiet, thinking they meant illness and "pinch and poke it to see if it would cry." He also brooded over the fact that his wife was occasionally late at their daily meetings, although this was always due to unavoidable domestic duties. Furthermore, he was oppressed by the extremely masculine, domineering personality of a colleague, one R., who tried to "boss" him.

It was discovered that the patient suffered from *ejaculatio precox*, while his wife was frigid. His constant complaint, viz., "If my wife would come earlier an hour or so, I would feel better. Doctor, why *doesn't* my wife come earlier?" was found to be a displacement of the anxiety arising from only partially satisfied libido upon an incident of quite innocent appearance having a similar disturbance of time relation-

ship and mutual adaptation. His preoccupation with his child was traced back etiologically to adolescent masturbatic difficulties resulting in nocturnal emissions and fear of impotence. He made "a phallic symbol of his small son who represented a castrated organ or lost virility. The pinching and poking were tests, and when the child cried, *i.e.*, showed virility, it reminded him of adolescent seminal emissions, concerning the meaning of which he had been ignorant and anxious, with a sense of guilt. When the child was not crying, he feared that it was deficient, impotent. He had to test it in order to assure himself of his own potency."

Several other mechanisms are described in this paper, which space permits us to mention only. Thus there was a fancied trouble with the right side of his face, ostensibly following a fall from a bicycle, by which he really meant a moral sense of fall. The appearance of his face, as well as an envisagement of his mother's face in time of conflict, represented a "desire to return to the comforting presence of his mother and to a life with 'Mother Nature' not so exacting as the present—to get close to the face of Nature." There was also a masochistic element and a fear of thunderstorms, associated with anal phantasies in childhood.

Dr. Isham reports that: "The analysis was by no means complete at the end of the twenty-second session, but he was rid of the troublesome obsession regarding his son, had made a better adjustment towards his wife, and obtained an insight into his feeling toward R."

This little paper is well worthy of reading by all psychiatrists and neurologists and we would suggest that even the general practitioner would not be harmed by its perusal. Certainly if it did nothing else, it might suggest to him the desirability of going back of obscure nervous symptoms and, far from being contented with the affixation of one of the time-honored labels, such as "Hysteria," "Neurasthenia," "Psychasthenia," etc., try to find out what the patient means by his symptoms, what difficulties he is endeavoring to surmount, and how he can be aided to adjustments of greater social value. [Lind.]

Kretschmer, Ernst. CRITIQUE OF THE UNCONSCIOUS. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. 46, p. 368.]

When the war broke out, the author states the theory of hysteria was in a peculiar position. Freud was hated but he was believed. His main hypothesis, at first received with hesitation, became the backbone of the concept of hysteria. In its application to the neuroses it bore good fruit, broadening the psychic point of view and directing research to the etiological importance of the effects of forgotten or stubbornly hidden experiences. But the author finds that the hypothesis of the unconscious and of repression in application to the enormous number of hysterical cases encountered in the war has been a hindrance instead of an assistance. It was found in the very beginning that the factors which before the war were considered the sole essential ones in the production of the

neuroses, the pathogenic structure of experience, the sexual and infantile roots, the cultural and individual conditioning moments were all replaced by a single factor of quite different nature. For thousands of men from the general population nothing more than the fright of the firing line and the fear of a repetition of the experience was necessary to produce hysterical shaking tremor. The same conditions were discovered as in peace times but could no longer be explained in the same manner, that is, as entirely due to the repressed experience, and it thus became apparent that while the discoveries which had hitherto been made were important factors in hysteria, they were not the essential moment. According to the author the real problem is: after the individual has been brought to the point of the onset of the hysteria, either by long and intricate experience, or by some simple momentary event, how does the transformation of the psychophysical energies of the individual into known psychomotor and sensory complexes which we call hysteria, take place? How does it come that the elaborations of experience in some persons result in a paranoid reaction, in others in a compulsory neurosis or depression, or in a third group in shaking tremor, and in what way is this brought about? The author answers that the process which makes hysteria what it is is not intrapsychic, but psychophysical, is not concerned with complexes, repressions, sexual conflicts, and infantile traumas—the unconscious and subconscious. These are only preliminary factors. The real process has reference to the will and reflexes—is one of neuropsychic dynamics. For explanation of the mechanism by which a repressed experience can produce the symptoms of hysteria it is always necessary to have recourse to the biological law of the shortening of the path of a function by repeated exercise of the function. Just as when skill has been acquired in reading or writing many of the intermediate nervous processes are dropped out of the chain of associations, so, in the neuropsychic acts, affects and efforts arise without the intervention of the correlated idea. Repression is only a special instance of the principle at the root of all hysterical mechanisms—the principle of the shortening of the reflexes. Thus a clear idea of repression is arrived at inductively, according to which it is regarded as a result which takes place in the course of the physiological process of the shortening of reflex paths—a view which renders superfluous the speculative concept of an independent unconscious or subconscious. [J.]

Pieron, Henri. TENTATIVE EXPERIMENTAL ANALYSIS OF SENSORY LATENCY TIME. [*Journal de Psychologie*, 1920, April 15, Vol. 17, p. 289.]

The author studies the peripheral element in the physiology of sensation which has replaced the theory of psychophysical laws as recognized by Fechner and Weber. One of the fundamental problems of physiological psychology has been to determine the time which elapses between the beginning of sensorial excitation and the correlative reaction mani-

festing the efficacy of the stimulus. Before determining the cerebral processes involved, it is necessary to understand the interaction of the stimulus and the receptors. The most important of the laws relating to the reaction is that which affirms in general that the time of reaction decreases as the intensity of the excitant increases. This law of the decrease of the reaction time, as a function of increasing intensity may, however, be different for different sensations, according to the mode of excitation, etc., though a certain relationship in the curves representing the varying proportions is always preserved—a fact of evident importance as behavior of these curves indicates that the central processes in the reflex arc may remain practically identical no matter what the category of the sensations and light would be thrown on the nature of these cerebral processes if the differences met with in the various modes and qualities of stimulation could be accounted for by variations in the peripheral factors. The hypothesis which the author sets forth is that there are variations in the latency period of stimulation due to the fact that with stimuli of increasing intensity there is, within certain limits, an increasing rapidity of response to the stimuli which modifies the whole course of the phenomena within these limits. The author gives the results of his experiments illustrating his hypothesis in mathematical formulae. The author points out an error made by Woodrow (*Psychological Review*, 1915), who from failure to understand the value of the peripheral phenomena concluded that certain essential processes must be central and associative. Woodrow stated that the action time of the cessation of an excitation is in all cases the same as the reaction time to the beginning and assumes that the regulation of the phenomena must take place in the central mechanism, because he finds that the image due to intense light is more persistent than that arising from feeble light. The author asserts that facts of sensory physiology show just the contrary, namely, that the persistence is greater, the weaker the intensity and vice versa, and further that this phenomenon is at its maximum at the threshold and it is on this persistence in inverse ratio to the intensity that "flicker photometry" is based, which equalizes the intensities by equalizing the persistence at the sensorial threshold. It is therefore the sensory and principally the peripheral phenomenon which determines the action time to the cessation of excitation. All the author's experiments give results from which he is able to conclude that the action times of excitants compared with the total reaction times are just such as would result if all important variations in response to stimulus depend on the peripheral latency times. [J.]

Ritterhaus. WAR HYSTERIA. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. 50, p. 87.]

The author describes an observation made on himself which he compares with his experiences of four years as head of the psychiatric section on the west front. As is well known there are three different

theories of origination of the war neuroses: (1) that they are purely psychogenic, ideogenic; (2) that they are neurogenic, activated by a psychic "shock" or through the "will to disease"; (3) that there is a double etiology for the disturbances—two phases, first an organic, perhaps acute material change in the central nervous system caused by the fright (the centripetal physical wave of Oppenheim) and then the real chronic neurosis, developing secondarily, as psychogenic or ideogenic, from the shock. From his experiences at the front the author was first inclined to assent to the first explanation and in about 1,500 cases of traumatic and other hysteria, he saw not a single case where, in his opinion, the psychogenic factor did not absolutely dominate the disease picture. Notwithstanding this he became convinced that in some cases a physical (ultra-anatomic) change in Oppenheimer's sense may play a rôle as the first phase of the disease. This conviction was brought about by an accident which befell him shortly after his return from the war. He fell from a ladder from a height of two meters, striking the right elbow. There were no direct signs of brain concussion, nothing further than a slight momentary stupor and paleness. The author does not consider himself hysterical and there was no psychogenic moment present, no possible purpose which he could serve by becoming ill, yet there ensued a fine tremor of the whole body and a distinct, somewhat coarse tremor in the right injured arm—a monosymptomatic tremor such as is regarded by nearly all writers as specific for hysteria. The author was able soon to inhibit the tremor by energetic effort or will. In this experience he sees confirmation of Oppenheim's view of hysteria. The "hysterical fixation" of the symptom would, of course, depend on the psychopathic tendency of the individual. [J.]

Hahn, R. "REPRESSION" IN NONHYSTERICAL DEPRESSIVE CONDITIONS. [Archiv. f. Psychiat. u. Nervenkr., 1920, Vol. 61, p. 735.]

The author discusses the idea of repression as introduced into psychopathology by Freud, and designates it a special form of forgetting. An idea with painful emotional emphasis is repressed. According to R. Avenarius such an idea vanishes as a value which cannot be expressed verbally but nevertheless continues to influence the choice or rejection of lines of behavior. The repressed idea splits off from the personality and forms connections in an incongruous manner with other ideas. Freud arrived at his theory from the study of hysteria, and repression is considered as a special instance of hysterical splitting of the personality. It is a typical hysterical symptom according to the present-day understanding of hysteria and differential diagnostic difficulties are supposed to be encountered only in reference to wilful silence or lying. The author describes a case which he considers interesting because clinically it certainly does not belong to hysteria and yet it presents a phenomena at least very closely allied to repression. A woman had lost one son in the war and after a natural expression of grief the idea took

possession of her that she might lose her other son, gradually acquiring force until she believed it so fully that when reassuring letters arrived she refused to credit them. She finally arrived at the idea that she never had any children at all, that the war had never existed. The son was entirely eliminated from memory, and with these memories vanished also those of her former life, of her father and mother and relatives, and her entire personality was disintegrated. It could not be said that the anatomo-physiological foundation which must be assumed for memories, the "engrammes" were destroyed, for the patient was not demented. The condition was due to the fact that the "engrammes" were rendered ineffective. It may be said that they were thrust back into the unconscious or subconscious, but, however this process may be explained theoretically, it is obvious that with the patient in question the repressed ideas were not forgotten in the usual sense of the word and the case may be considered as one of repression notwithstanding that only one of the factors of repression according to Freud's concept, namely, the anxiety as the causal element, was present. The diagnosis presenile depression was substantiated by various symptoms and after eight months the patient sank into a stupor-like condition. The author cites a second case in which anxiety of similar nature played a rôle, as illustrating the relation of repression to compulsory ideas to which Freud has called attention. Here the patient, fearing the loss of an infant child, was tortured with the compulsory idea of killing the child. In this latter case the compulsion did not, as in the first case, form a contradictory and impossible system, but having gained a degree of independence, existed in the psychic life as a contradiction such as exists to a certain extent in psychically normal persons. [J.]

Laignel-Lavastine and Vinchon, Jean. THE ECHO IN READING. [L'En-céphale, 1920, August 10, Vol. 15, p. 496.]

Patients suffering from persecutory delirium with hallucinations read little and always the same books; the women rarely open any other book than the hymnbook or the missal. If the reason is sought some patients answer in such way as to show that the delirium absorbs all their mental activity; or that they find a better refuge from their miseries in their reveries. Some who try to read do not continue because they are tormented by phenomena known as the "echo of thought." The authors have studied this difficulty in subjects of various degrees of culture suffering from deliria of persecution of different nature. In all four cases studied one phenomenon recurred each time an attempt at reading was made, *i.e.*, moral and physical distress, as phenomena accompanying the hallucinations. In answer to the inquiry as to the exact moment the echo occurs in reading, the authors' patients responded that it takes place at the same time as the reading. More rarely, however, the echo begins after the text is read. In the first case it is comprehension which is disturbed; in the second, reflection. In these four patients the internal

language consisted only of vague unintelligible whisperings with the exception of occasional words, the relation of which with the delirium was clear, and these, because of this dominating obsession, had the semblance of being of objective origin. Sometimes these hallucinations were not mental representations at all but real buzzings in the ear which were interpreted secondarily. Explaining these phenomena, the authors say that in early stages of evolution an internal visual or auditory language may have existed, but to the modern brain, enriched by the experiences of countless centuries, reflection would be greatly impeded by instruments of this sort. Introspection shows that our ideas are independent of the words which express them. Discussing the question whether these hallucinations, these echoes in reading, can be modified voluntarily, the authors refer to Bergson's analysis of the act of reading. It does not consist of a perception of the printed words but of superimposing ideas thereon and in the identification of the ideas with memories of similar character. The intellectual operation of reading, like internal language, has been simplified. The feeling of effort arises at the moment when the ideas suggested by the printed words are realized in concrete images coinciding with these words. If under the influence of a mental disturbance this last operation escapes control to the point of seeming due to an extraneous activity, the "echo" in reading will be invoked by the patient as the explanation of the pathological phenomenon. With two of the patients the words of the text were covered by words of an opposite sense. It is not necessary to have recourse to the hypothesis of visual hallucinations to explain this phenomenon; the words of contrary meaning superimposed on the words of the text are suggested by these latter. It may be concluded that where the pathological phenomenon has not become chronic it may be possible to modify the hallucinations as was shown in the cases with "antagonistic thoughts." [J.]

Van Valkenburg, C. T.

1. THE PHENOMENON OF SUBJECTIVE COMPULSION. [Psychiatr. en Neurologische Bladen, 1916, No. 1.]
2. THE ORIGIN OF PARANOID IDEAS. [Nederl. Tijdschrift voor Geneeskunde, 1917, II, No. 17.]
3. INDIVIDUALITY AND PSYCHOSES. [Psychiatr. en Neurologische Bladen, 1918.]

In the first article the author gives a description of the beginning of compulsive ideas analogous to the phenomena of passive attention. The rôle of affective elements is in every case acknowledged; they are the only possible source of the energy that characterizes the ever returning, vexing ideas. The inability of the patients to lay them aside is, as a last resort, due to his constitution as described by Janet. In No. 2 the writer endeavors to give a new explanation of the birth of ideas of reference [*Beziehungswahnideen*]. The first and earliest alteration related to the consciousness of personality [phenomena of repersonalization in

a wide sense]. In the third article the prominent importance of alteration in the consciousness of the own individuality and of self is put forward not only in cases of psychasthenia but also in melancholia and mania. A new conception is given of the relation between psychical mechanisms in these diseases. [Author's abstract.]

Musser, J. H., Jr. NOTES ON GASTRIC SECRETIONS IN NEUROCIRCULATORY ASTHENIA. [Am. J. of the Med. Sciences, May, 1920.]

It is now quite generally held that soldiers suffering from neurocirculatory asthenia are victims of a certain constitutional inferiority leading to certain types of neuroses which are apparently the result of fear and fright. Symptoms which develop in these patients are referable in part to vagus irritability. The relationship between the nervous systems, more especially the vagus, and the stomach is extremely close. It was felt that a study of the gastric secretions which are controlled by the nervous system through the secretory fibers of the vagus would show in these cases of neurocirculatory asthenia a vagus irritability, and would also add, if there was evidence of hyperacidity, a further diagnostic aid in determining the condition. Eleven normal individuals as controls were given test meals and eleven soldiers suffering from neurocirculatory asthenia were also given test meals which were extracted by the usual fractional method. The result of these studies, in soldiers living under identical conditions, showed in the neurocirculatory asthenia case a high gastric acidity affecting the free hydrochloric as well as the total acidity. This fact seems to add further evidence to that already accumulated that these soldiers are suffering from a neurosis with which is probably associated an hyperirritable vagus. [Author's abstract.]

Bolten, H. HYSTERIA IN CHILDREN. [Nederlandsch Tijdschrift v. Geneeskunde, 1919, Vol. II, No. 13.]

It is advisable from a practical standpoint to call attention to the frequency of hysteria in children, especially with a view to the treatment, which is bound to be psychical.

No single dominating symptom is to be fought down, as in that case the hysteria remains, but the patient is to be convinced of the moral cause of his complaint. He has to be made to understand the connection between former emotions, his weakness underlying the exterior factors, the reasons for which they predominate, and the symptoms caused thereby. This educative treatment which at the same time brings the children to the conviction that they themselves are coöperating in their recovery, is to be preferred above all other methods of hypnosis and quickly active suggestive treatments.

The differential diagnostic symptoms in general use for distinguishing between hysterical and epileptic patients do not agree with the findings of practice. The standpoint still taken by some people that the diagnosis "hysteria" may not be made if no stigmata are demon-

strable is untenable. In the many cases that I handled, stigmata were absent in the great majority, and are found very rarely in the monosymptomatic forms.

Affections of the sexualsphere were also rare in anamnesis. Freud's theory is far too partial, it makes the mistake of trying to fit the most common and simple things into the sex complex, on theoretical grounds. Why should all "lust feeling" have a sexual basis? In all my cases (and this applies also for hysteria in adults) I could determine tropical and vasomotor disturbances. Among these are to be mentioned: deviations of the teeth (deferred dentition both of the milk teeth and the other teeth, precocious caries, inequality of the teeth, and notched edges), deviations of the nails (insufficient growth, white spots, decreased gloss and brightness).

The vasomotor disturbances are found in dermatographia, quick blushing and turning pale, continuous cold hands and feet, general paleness not due to anemia. Chillblains on the hands and chapped skin on the fingers that recovers slowly are also features of vasomotor origin.

This group of symptoms, to which also belong the oft recurring spastic constipation, urticaria, Quincke's edema, is regarded by me as an expression of a hypotonia of the sympathetic nervous system. This view is supported by the fact that the aforementioned symptoms can be caused to disappear by preparations of the thyroid gland, which gives tone to the sympathetic.

The constant display of sympathetic hypotonia symptoms in cases of hysteria denotes that the sympathetic system—and maybe the whole vegetative nervous system—plays an important part in the producing of a hysteria.

Next to the disturbance of the imaginative life, the condition of the vegetative nervous system is undoubtedly of the greatest importance and more attention should be given to it.

In a detailed publication (*The Vegetative Nervous System in the Neuroses*) which is to appear shortly, I have treated the rôle of the vegetative nervous system for the pathogenesis of the neurosis. In this work I reach the conclusion that a hypotonia, especially of the sympathetic, is of prevailing importance. [Author's abstract.]

Monrad-Kohn. HYSTERIA IN CHILDREN. [Ugeskrift for Laeger, Jan. 8, 1920, J. A. M. A.]

Monrad-Kohn gives a review of the recorded history of hysteria in children, the etiology and the pathogenesis and then describes the extremely varied manifestations of hysteria in children. He emphasizes that in children it is monosymptomatic, that is, there are merely single or a few manifestations while there are none of the permanent symptoms, the so-called stigmata. Over 200 cases of hysteria in children have been encountered in his practice in the last ten years. It simulated in the different cases almost the entire range of organic pathologic

conditions in the nervous system, the urogenital and digestive apparatus, and the abdomen, besides various surgical processes. Numerous instances of each type are described and the treatment found most effectual. The prognosis of hysteria is far more favorable in children than in adults. Treatment has to be exclusively psychotherapy and this requires skill and tact, and usually removal of the child to some wholesome environment where he will not be the central figure. The transference to a hospital may make the child forget his hysteria completely. The psychotherapy may be masked with some local application to cause a little pain or shock, but the main thing is to impress the physician's authority on the child while convincing him that the doctor is his friend. Sometimes a child with atasia-abasia can be cured by standing him up on the floor and categorically commanding him to walk. A promised reward may aid in some cases. A sudden cold douche or electric shock on the region affected may succeed, but Monrad-Kohn warns that when any of the above measures fails, it is useless to repeat it.

In a paroxysmal form of hysteria, systematic ignoring of the child often proved effectual; especially when the child was allowed to overhear the persons in the room speaking of what would have to be done to him if the attacks continued. Examination under a general anesthetic, besides roentgenoscopy and tuberculin tests, may be necessary to exclude organic bone disease. One little girl had a hysteric sacrocoxitis, others hysteric neuralgia in the knee, hip joint, heel or spine. There was usually a history of some trauma attracting attention to the region and the cure is often tedious then as the local measures applied had anchored the hysteria more firmly. In the case of one girl of 5 a specialist had diagnosed cervical spondylitis and insisted on orthopedic treatment. The symptoms became so alarming that the child was taken into the general hospital where the diagnosis was changed to hysteria from the negative tuberculin and roentgen findings, the history of pediculosis with impetigo and swelling of the glands in the neck, causing pain when the head was moved. The torticollis, etc., were only the hysteric prolongation of a previous reflex torticollis, and the cure was complete in a few weeks. In infants about a year old, hysteric anorexia may be connected with weaning or be a hysteric prolongation of some gastro-enteritis. Removal to another environment usually cures it at once. One girl of 11 had become so emaciated and weak from the hysteric anorexia that the pulse was only 40, respiration 16. Isolation in the hospital did not help until she was told that she would have to be fed through a "snake," the Danish word for "snake" and "tube" being the same. Then she began to eat normally until she coaxed an attendant to show her the "snake"; no more eating after that. Finally Monrad told the nurse in her presence that if she did not begin to eat soon she would get decubitus. The girl inquired about decubitus and was shown the large loathsome sores. This cured her anorexia, and

she gained 1,900 gm. in weight in two weeks, but the anorexia returned a few months later. In three cases there were hysterical strictures in the esophagus. Hysterical vomiting is usually cured by removal from home, even when the vomiting has kept up for years. In five cases the hysteria simulated appendicitis, the children having heard older people describe the symptoms.

Wechsler, I. S. HYSTERIA SIMULATING BRAIN TUMOR. [New York Medical Journal, Vol. CX, No. 21, Nov. 22, 1919.]

The patient was a young woman of 23 who complained of spells, lasting a few seconds to one minute, during which she lost all power of speech and had weakness of the right hand and arm. Her condition began suddenly with headache, dizziness, and the spells. She gradually became drowsy and sleepy. Physical examination showed a slight right apraxia, interference with handwriting, some motor aphasia, slight diminution of strength in the right hand and concentric contraction of the fields of vision. Subsequently the spells increased in frequency, there set in weakness of the right leg, twitchings were noticed in the right fingers during the spells. She became more drowsy, yawned a good deal, and began to drag her right leg. The diagnosis of the left cortical or subcortical neoplasm was made mainly on account of the developing right hemiplegia with the aphasia; but owing to the absence of more definite signs of intracranial pressure operation was deferred. The patient was observed for two months, then lost sight of for a time, after which she returned completely cured, thanks to some herbs which she received. A closer investigation of the psyche of the patient revealed an obsessional neurosis and a fertile hysterical background, which together with the sudden disappearance of the symptoms left no room for doubt that her symptoms of brain tumor were those of hysteria. The object of this report is not so much to show that hysteria can simulate brain tumor but that in the present instant it gave a picture of actual anatomical involvement and corresponded to strict cerebral localization, a picture which hysteria is never credited with. [Author's abstract.]

Schuster, Paul. THE MECHANISM OF HYSTERICAL SCOLIOSIS. [Neurol. Centralbl., September 16, 1918, No. 18, Vol. 37.]

One of the little known symptom pictures in which hysteria presents itself is that of hysterical scoliosis, accompanied by an elevation of the pelvis and a dropping of the shoulder of the same side. Notwithstanding the fact that the author had an extensive traumatic material at his disposal, he has met with few cases of this sort. The muscle mechanism which is responsible for hysterical scoliosis has been little studied and writers are content to refer it to a convulsive tension or contraction of the muscles of the back, considering the muscles to which the primary contraction is due to be the M. erector and quadratus lumborum, and

perhaps also the gluteal muscle. The author had a singular opportunity of studying the mechanism of this disease, not in a person affected by it, but in the "Musclemsch." B., well known in German clinics, who has learned from years of practice to set every single muscle in his body in motion, in a manner which would be absolutely impossible for any ordinary person; he was able to produce a scoliosis resembling true hysterical cases. Wertheim Salomonson believes that the scoliosis is produced by a subluxation of the hip joint and, from the sudden manner in which hysterical scoliosis is cured, that this subluxation can be brought about voluntarily. Having studied the manner in which B. imitated the positions of hysterical scoliosis, the author thinks he can give an approximate picture of the mechanism. The primary factor in hysterical scoliosis—and in this the author agrees with Wertheim Salomonson—is a process in the hip joint, but not as Salomonson thinks a dislocation or partial dislocation of the same, but only a turning of the pelvis on the head of the femur. The turning takes place around the fronto-occipital axis of the hip joint of the side of the pelvis which stands lowest (The author assumes in his description that the left side of the pelvis is elevated and the right has sunk down, so that the vertebral column describes a scoliosis convex on the right). The turning of the pelvis around the head of the femur of right side (the side of the lowered pelvis) is produced in such a way that an abduction of the pelvis ensues. Simultaneously with the turning of the pelvis on the head of the right femur, there follows a turning in the opposite direction of the pelvis on the head of the femur of the left side, that of the elevated pelvis. This last named rotation must follow, because the left leg influenced by gravity hangs in a vertical position and in standing, the leg must preserve a position essentially parallel to the other leg. Just as in the hip joint of the right side an abduction of the pelvis away from the head of the femur ensues, in the hip joint of the left side there is produced an abduction of the pelvis toward the hip joint; that is, the distance of the symphysis from the neck of the femur is diminished on the left, while on the right it is increased. The pelvis is made to rotate on the two femur heads because the distorted abdominal muscle and the large erector spinae on the one side are set into forceful activity and thereby raise the crest of the ilium against the costal arch and the vertebral column. The vertebral column, in consequence of the turning of the pelvis, inclines in its lower part to the side of the lowered pelvis, but with its upper part must make a compensatory movement to preserve equilibrium. Thus when the left side of the pelvis is elevated, a scoliosis is produced. The distorted position becomes lasting because the model, or it may be the hysterical individual, fixes or preserves the strained attitude of the pelvis and also the secondary curvature of the vertebral column whether standing or lying down or seated. If he supports himself on one leg as in the natural station *hanchéé* (for ex-

ample on the left), then the right leg, which on account of the elevation on the left and the lowering of the pelvis on the right has become too long, must be flexed and held in position of abduction. If the opposite position is taken, the tip of the foot and the whole foot must be twisted, so that the apparently shortened leg on the side of the elevated pelvis can reach the ground. But in the process the head of the femur always remains in the hip joint, and the view of Salomonson that luxation or subluxation is produced must be abandoned. The head of the femur fits so firmly in the socket and is so tightly held in place, both by the atmospheric pressure and by the ligaments, that dislocation either by the hysterical diathesis or through special practice seems almost impossible. After the significance of the turning of the pelvis on the head of the femur in the production of scoliosis is understood, it is also easily understood why B. had difficulty in producing an imitation of it when he was sitting or lying down. The author is of the opinion that he is fully justified in assuming the same mechanism is used for the production of the hysterical scoliosis as B. made use of in producing the imitation. The author adds a few words concerning the psychic mechanism of the hysterical scoliosis. This mechanism may be best studied in the scoliosis produced by trauma. Usually that side of the pelvis is elevated which corresponds to the side of the body affected by the trauma. The patient has apparently an instinctive tendency to withdraw the part of the body affected from the influence of the trauma, for this purpose making a movement of defence (somewhat like the movement of flight in the so-called retraction reflex of the leg). The elevation of the one side of the pelvis and the consequent turning of the pelvis on the fronto-occipital axis of the femur head is, therefore, the primary movement, and the scoliosis is produced secondarily by the turning of the pelvis. The real purpose and object of the altered posture is the subjectively attained fixation of the injured half of the body by means of the elevation of the pelvis. [J.]

Froment, J. HYSTERIC PARALYSIS. [Lyon Méd., Dec., 1919, J. A. M. A.]

Froment reiterates the importance of treating promptly and curing, usually in a few hours, hysterical paralysis, as otherwise it may drag along and become indelibly fixed. The opportunities for such "miraculous cures" as are possible with hysteria are too few and far between for any of them to be neglected. There is no use wasting time in seeking for stigmata of hysteria; the search is liable to impress unfavorable ideas. They are far from constant in hysteria, and the search for them may do harm by its effect as suggestion. It must be borne in mind that although hysteria may simulate all kinds of nervous disturbances, it generally simulates them in an incomplete form, and the absence of certain phenomena which we have reason to expect in a given clinical picture will reveal its hysterical nature, and show that it is pure fiction, although

unconscious fiction, and often sincere. The subject is merely the victim of a simple illusion. The paralysis varies in its intensity from moment to moment, and according to the act required, and it may disappear completely at certain moments. In some movement, for example, or some attitude, we may detect the intervention of some group of muscles which seemed before to be totally impotent. Such paradoxical findings, along with the anatomic and physiologic integrity of the limb affected, speak in favor of hysteria. It is important, however, to detect any associated organic disturbance which would hamper or annul the measures directed to the hysteria. The treatment requires on the part of the physician an inflexible will, patience, tenacity, kindness, iron energy, absolute confidence in the outcome, skill and self-possession. It is useless to reason with the patient. By varying the points of attack we seek to detect some movement in the paralyzed limb and convince the patient of his ability for movement, and start on from this for further progress. The hysteric paraplegic, for example, should be stood on his feet, and by aiding and making him walk, demonstrate to him that he can walk. Skill and tact are necessary to keep from falling and from fruitless attempts, which confirm him in his conviction of his absolute paralysis. Sometimes it may take three or four hours to accomplish the result, but the session should not be concluded until some striking result has been attained, so that there can be no going back.

Goldstein, Manfred. WAR EXPERIENCES IN THE FIELD IN REGARD TO EPISODIC LOSS OF CONSCIOUSNESS. [*Archiv f. Psych.*, 1919, Vol. 59, p. 713.]

There was episodic clouding of consciousness in 21 per cent. of the cases brought to the field hospital for nervous and mental diseases with which the author was connected. Of these cases 57 per cent. were hysterical and 16 per cent. were cases of genuine epilepsy. It has been asserted by Ritterhaus and others that epilepsy can be caused by the conditions of life on the battlefield in persons who had never before manifested any signs of the disease. Judging from statistics analyzed by him, the author comes to the conclusion that war hardships as such are not sufficient to cause epilepsy in a healthy individual. On the other hand, it became apparent from this analysis that in nearly one half of the cases of epilepsy where for many years no attacks had manifested themselves, the phenomena reappeared under the severe physical and mental tests in the field. It is often difficult to make the diagnosis of epilepsy, for the usual distinguishing signs cannot always be depended upon. The Babinski may be absent during the attack; the loss of reaction to light occurs in hysteria also; in both epilepsy and hysteria the patients sustain injuries without manifesting any reaction to pain. Cocain injection yields no unambiguous results. Cases are adduced to prove that the hardships of war may be contributory to an outbreak of traumatic epilepsy in those who at one time, even many years previously,

had suffered brain injury, or may be the cause of such an outbreak. Only a very small percentage of the episodic disturbances of consciousness met with in the war are of organic origin; they are for the most part psychogenic, the numerous "shocks" incident to life in the field being of a nature to overturn the mental equilibrium of persons of weak volition accustomed only to a life of peaceful labor.

De Crinis, Max. HUMORAL AND BIOCHEMICAL STUDIES OF THE EFFECTS OF EXPLOSIONS ON THE HUMAN NERVOUS SYSTEM. [Archiv f. Psych., 1919, Vol. 59, p. 988.]

The researches here described were undertaken for the purpose of more exactly defining the serological features of the disease picture resulting from shock due to explosions; in order thus to gain understanding of the somatic foundation of the symptoms. The author discovered previously unobserved objective symptoms indicating profound alterations in the innervation of the sympathetic system and disturbances in the carbohydrate metabolism. There was a dysfunctioning of inner secretory glands, especially of the suprarenals, as well as of the liver and pancreas. The heightened irritability of the sympathetic nerve was proved by the dilatation of the pupils when adrenalin was dropped in the eye and by the vasomotor disturbances. The influence of psychic experiences (fear) on the suprarenals is illustrated by effects produced by explosions on the activity of these glands in animals. According to the author the disease picture resulting from explosions is composed, on the one hand, of the injuries due to extreme exhaustion and, on the other, to the effects of the constant inflow of the complex emotion-producing stimuli from explosions. These two factors lead finally to a disturbance of the endocrine activities. The symptom of heightened irritability of the sympathetic system is attributed to the correlation which is known to exist between the suprarenal activity and the tonus of the sympathetic system. The alimentary glycosuria which makes its appearance is also traced to the disturbance of the inner secretions of the suprarenals. Through their hormone, adrenalin, they have an influence on the carbohydrate metabolism. The disturbances of the liver and pancreas are also traced to disturbances of the suprarenal function, and these two organs also influence the carbohydrate element, governing its composition and decomposition in the organism. This coincidence of disturbances of function of the suprarenals with adrenalin mydriasis and alimentary glycosuria is not unique in pathology. In Basedow's disease, in which the dysfunctioning of the thyroid occupies the foreground there are also symptoms indicating disturbance of the suprarenals, adrenalinemia, heightened irritability of the sympathetic system (manifested in ocular phenomena) and alimentary glycosuria.

Carver, A. FORGETTING: PSYCHOLOGICAL REPRESSION. [British Medical Journal, Jan. 10, 1920.]

It is regrettable that in spite of the great advances achieved in psycho-therapy, so considerable a number of medical men continue to counsel "forgetting" as an effective means of cure in the psychoneuroses.

Analysis of patients shows that this so-called forgetting is nothing other than psychological repression, and that the severity of the morbid symptoms varies directly with the intensity and success with which "forgetting" is practised.

Taking examples from the war psychoneurotics one may distinguish roughly three grades of "forgetting" or repression.

First, that degree in which the idea of an event is so unbearable to the ego as to be immediately and completely repressed. As an additional security a protracted period of amnesia, in which the event is included, often results. Experience has amply demonstrated that the clearing up of such an amnesia is an essential step in treatment.

The second degree of repression does not come about so immediately, neither is it so complete. The patient may speak easily about most of the events of his military life, but certain of them are, on account of their highly disagreeable nature, incompletely repressed. All mention of these is studiously though almost unconsciously avoided. Such patients are particularly liable to deceive one and consequently to run a protracted course, for in them also recognition of the cause of their symptoms and failures must precede readaptation.

The third degree of repression is found among pensioners to be the most common and the most troublesome to deal with. In it there is no event of particular moment, but the patient attempts deliberately to extrude the whole period of his military service from his mind and live as though it had never been. The process is slow, and the latent period before the onset of definite symptoms is long: a considerable proportion of the men making no claim until the lapse of months after demobilization. Analysis of these patients generally shows that their powers of adaptation were never good and that all their lives they have manifested a strong tendency to demand that external conditions be made agreeable for them, rather than strive to adjust themselves and to dominate their environment.

As their environment is unsympathetic to this demand they turn from it and endeavor to forget the disagreeable.

Here again, then, the first step in our therapy is to bring our patient to a knowledge of what he is shirking.

But it must be borne in mind that the bringing to full consciousness of the forgotten—repressed—material is only a necessary first step, our ultimate aim being to readjust and reëducate the patient. In other words we must overcome a resistance, which is the obverse aspect of repression, before we can get our patient to adapt himself to external reality.

It would seem that failure to admit the unpleasant to full consciousness is the correlative of failure to adapt to external reality. The patient shirks, not the emotional but the cognitive component of his experience, because the latter calls upon him to "make good." Thus the underlying principle of the thesis advanced above differs from, though it does not contradict, the "abreaction theory." [Author's abstract.]

Myerson, Abraham. PATHOLOGY OF CONSCIENCE. [Boston Medical and Surgical Journal, 1920.]

The author states that many of the neuroses are characterized by an over-conscientious attitude of the individual towards himself so that his every act is very severely scrutinized and his own peccadillos magnified to an intolerable extent. He cites two cases of this kind. In one, a young man struggling to make his way through college, developed a horror of relaxation because it involved what he termed a waste of time. To him wasting time was a sin because one's duty was not fulfilled unless one utilized every moment for self-development and the good of others. As a result he overworked largely to escape his own reproaches whenever he idled. That this was not primarily a constitutional defect in his case was proven by the fact that by nature the young man was a good sport, enjoying what are commonly accepted as the good things of life and popular with his fellows. When it was pointed out to him that his headaches, dizziness, fatigue and lack of ability to concentrate were due to overwork, and this due in turn to a hyper-conscientiousness in respect to pleasure he promised to reform in the reverse direction than that usually implied by the term, namely to indulge himself more in the pleasure of everyday life and to regard such pleasures as measures for efficiency.

Case 2 concerned a young woman of a prim New England type who unfortunately was hyper-erotic during the menstrual period. By accident she discovered that manipulation of the clitoris brought relief from the distressing eroticism. Following the relief she was plunged into an agony of self-reproach, felt that she was a sinner of a very depraved type and that her act was uncommon and in proportion serious. The internal conflict brought about lowered her efficiency because it scattered her attention, brought about an obsessive circle of ideas and emotions of which self-reproach and depression were the predominating features. It was explained to her that her act was not uncommon, that it was largely reflex, and while unesthetic it could hardly be classed among the mortal sins. She was instructed that she should take her derelictions in this regard without too much self-reproach, and though she was not encouraged by any means to take advantage of the relief which the procedure gave, yet on the other hand she was not to view herself too critically and to regard her feeling as part of the peculiar human liability to err. Patient was tremendously relieved when she learned that her act was not unique, promised to take insofar as she

could, the prescribed attitude towards herself. Somewhat later she reported that all her symptoms had disappeared and that she was in excellent condition. [Author's abstract.]

Horn, Paul. FURTHER DATA CONCERNING SETTLEMENTS FOR NEUROSES RESULTING FROM ACCIDENTS. [Neurol. Centralbl., Jan. 16, 1919, No. 3, Vol. 38.]

The author comes to the conclusion that neuroses from accident where settlements are made have, if there are no severe complications, a thoroughly favorable prognosis, while cases of the same character and severity where pensions are granted run a considerably less favorable course. In order to secure these advantages it is important that the diagnosis should be clearly made, so as to exclude cases with severe complications in the form of lesions of the nervous system or of the internal organs; and that the settlement should be assured, if possible, within the first weeks or months. Fortunately the authorities, especially those connected with the railroads, are coming to a realization of the importance of these factors, both for the state and for the patients themselves, and are making efforts in the direction of bringing about settlements for a certain definite sum instead of granting life-long pensions. The author also has the impression that the authorities are inclined to abandon the views which formerly prevailed that neuroses from accident are severe and incurable injuries and, in fixing damages, to be guided by physicians who have studied these cases in the light of modern science, with the result that the suits for damages are being reduced, the sums demanded are being restricted within reasonable bounds, and the number of recoveries is increasing. The author was able to follow forty cases of neuroses after settlement for damages and found that there was full social recovery in 90 per cent., and improvement in 10 per cent., therefore 100 per cent favorable results. He comes to the conclusion that this high percentage was partly due to the fact that there were no serious complications in these cases, but partly to the fact that the settlements were made promptly and without long legal proceedings. [J.]

Smurthwaite, H. WAR NEUROSES OF THE LARYNX. [Jl. Laryng., Rhin., Otol., Jan., 1919.]

Most of the patients losing their voices from shell or gas shock, have it restored in a few days by rest or treatment by electricity, etc. From an experience of 260 cases of from three to twenty-four months' duration, comprising 13 cases of absolute mutism, 239 of aphonia and 10 of stammering or stuttering, the author says that, though a few are due to primary laryngitis consequent on the irritation of the gas, a larger number are caused by pure shock. He assumes that a patient unable to cough or speak has an organic lesion, nerve or otherwise, but if unable to phonate, but can cough normally, then he has some form of adductor

paresis, which is, as a rule, functional. In cases of the latter class four positions of the cords are found on attempted phonation: (1) cords elliptical (*thyro-arytenoides internus* paresis); (2) cords freely abducted, in cadaveric position; (3) both true and false cords tightly pressed together; (4) cords approximate in anterior two thirds, triangular space in posterior one third (paresis of *inter-arytenoides*). False cords meet in middle line due to air distension of ventricles from upward air pressure. When there is no organic mischief and the patient can freely abduct the cords, but an attempt to pronounce "ah" brings the cords into any of these positions, the case is almost surely functional, though myopathic paresis, from early tuberculosis, has to be excluded. The treatment is both moral and physical, the former being by far the more important. Having made sure of the diagnosis, the patient is got by himself and assured with emphasis that he has absolutely nothing of a serious nature in his larynx and that there is no reason why he should not speak normally, etc. With firmness, confidence and conviction of his adviser's ability to restore his natural voice, the power is instilled into him to make the initiatory effort to bring his cords into the proper position, or the necessary expiratory blast for voice production. Without exception all these patients breathe shallowly and must be taught to breathe correctly and then to attempt phonation only during expiration. The patient is made to expand his chest fully several times, then to hold the breath at full expansion and make a quick expiratory effort or cough. This generally elicits quite a good note. Sometimes the act of laryngeal examination—the tongue being forcibly pulled out and the patient told to say "ah"—is sufficient. In cases of increased laryngeal tension or tonic spasm the author assists the patient to increase the upward pressure of air by compressing the lower ribs, directing him to use his abdominal muscles forcibly to phonate the sound "ah." If this fails, he makes him forcibly groan, at the same time withdrawing the tongue. The placing of a laryngeal probe directly into the larynx has the effect of relaxing the pressure, if the patient be told to cough at the same time. By these means the first musical sound is eventually elicited. The muscles of phonation then require exercise to increase their tonicity. The patient must draw out his tongue forcibly himself and practise saying "ah." He must go through a course of deep breathing and practise humming tunes. Next the humming is interrupted with the lips and tongue and then the phonation of "ah" tried without the humming. The patient attempts counting, phonating each note slowly to keep the cords in natural vibration. He then essays reading aloud. Stammerers and stutterers must be taught to breathe correctly and deeply. The former must be shown how to sound his consonants, the latter must practise his vowels. The vowel sounds must be attempted staccato and later the consonants are added. Great patience and persistence are often required. [Med. Jl. Austr.]

Govantes, J. M. THE ALGIAS OF PSYCHASTHENIAS. [Rev. d. Med. y. Cir. de la Habana, v. XXIV, pp. 459-550].

The author describes a case of a young man, 22 years old, single with no personal or family history of unfavorable data. On admission, he was suffering intensely, tenderness in the right leg, convulsions and with evidences of great pain. On examination nothing justified the condition described, but the pain was continuous even when the patient was motionless. The author quotes Pierre Janet's *Les Nevroses*, p. 186, who claims that these algias may appear anywhere in the body but especially in the muscles of the extremities; sometimes this condition has been called by Moebius "akinesia algera." It may give rise to faulty diagnosis such as cancer of the breast when the muscles of that part are involved, or the genital organs may be the seat of the disease causing undue trouble should the patient be a hysterical woman. Physical measures and moral suasion were resorted to in this case, with success. No medicinal treatment whatever was used. [Author's abstract.]

Gordon, R. G. STAMMERING AS IT OCCURRED IN THE WAR. [Bristol Medico-Chirurgical J., Dec., 1919.]

Stammering is a common disability resulting from the war. It is generally accompanied by a certain degree of anxiety, which requires treatment as well as the special defect of speech. The disability is acquired under the stress of emotion, by imitation or in the course of recovery from other speech defects. Fear was the commonest emotion to induce stammering which is the direct effect of the rigidity of muscles thus induced, the condition being perpetuated by suggestion. Imitation is a more frequent cause in children but also occurred in soldiers. During recovery from mutisms the suggestion of voice disability is strong and easily accepted. The physical factors in stammering are:

- (1) Rigidity of respiratory muscles causing initial inhibition.
- (2) Rigidity of laryngeal muscles causing the monotonous voice.
- (3) Labial spasm causing the initial stutter.

Respiratory movement is always deficient and requires reëducation. There is always a mental factor consisting of a dread of stammering, apart from any other anxiety, and this is always the most difficult part to cure. In treatment it is always necessary to establish a bond of confidence between doctor and patient and encourage the latter to expect cure. Any accompanying anxiety condition must be sought for and if possible removed. The patient must be taught to reflex and breathe properly and then to produce words during easy expiration. At the same time he must be impressed with the importance of talking slowly. The monotonous voice is corrected by Scripture's "Octave Twist." The labial spasm may be corrected by training the patient to omit the first letter of a troublesome word, then to place the tongue and lips in the correct position without sounding the letter, and finally to say the whole word. [Author's abstract.]

Conklin, Edmund S. THE FOSTER-CHILD FANTASY. [*American Journal of Psychology*, Jan., 1920, Vol. 31, No. 1, pages 59-76.]

This study was undertaken to test by means of the questionnaire method the conclusions of psychoanalysts concerning the frequency of the foster-child fantasy, as well as to determine some further facts about it. Very complete returns were obtained under supervision from over nine hundred adolescents. The detailed presentation of the responses to each question indicate that 28 per cent. could immediately recall experience with the fantasy in this form. No opportunity for mediate recall was given and no effort made to obtain data concerning concealed forms of the fantasy; hence this is obviously a minimal figure. Twenty-five per cent. of these reported belief in the fantasy for varying lengths of time. The two stages of the fantasy reported by Rank are clearly indicated in the returns with the addition of a stage in which the child thinks of himself as of inferior parentage. This form of the fantasy appears almost as frequently as the later stage characterized by ideas of greatness. Two other stages of the fantasy development were suggested but not certainly indicated in the returns. The study verifies also Rank's statement that the immediate causes of the fantasy are feelings of parental neglect or lack of affection and romantic literature; but it also brings to light several other supplementary causes, such as, prolonged absence from the parents, marital infelicity observed by the parents, lack of companionship and the absence of mental and physical resemblance to the parents. Tabulation of the effects of the fantasy upon conduct as recalled and described by these adolescents shows that it was most frequently (50 per cent.) of a kind to alienate them from their parents. Domesticating conduct was rarely reported (6 per cent.). More than half of those reporting located their experience with the fantasy in the period from eight to twelve years of age. The duration of the fantasy for those who had actually believed themselves foster-children was reported to be more than a year by 49 per cent. Growth and the development of intelligence was most often mentioned as the cause of the removal of the fantasy among those who had believed it, but there are two thirds as many mentions of parental intimacy and a smaller number reporting discovery of convincing proof, such as physical or mental similarities and actual records.

Concerning Rank's presentation of the fantasy as undergoing development the writer says: "This questionnaire study not only supports but also considerably elaborates the psychoanalytic conclusion. All through the returns there are indications of the developmental stages of the fantasy. Concerning the forms of the fantasy there were those, a large group, who had but the vaguest if any idea beyond the thought of foster-childhood, some saying that they had never thought further than that. Then there were those who reported thinking themselves as different characters at different times. The apparent relationship of

the different form groups (incipiency, orphan, same social status, great parentage, supernatural being) suggests the same thing. The relationship of forms to causes carefully tabulated indicated the developmental interpretation of the fantasy as the only feasible explanation of the otherwise strange distribution of causes mentioned. The relation of the forms to the reported conduct effects pointed, if less clearly, in the same direction. Examination of the conduct effects indicated stages from meditation on a more or less fascinating idea to decidedly alienating conduct. Degrees of belief also appeared very clearly in the answers given. Even without knowledge of the psychoanalysts' conclusions it would have been difficult if not impossible to have interpreted this data otherwise."

After a comparison of the results obtained by the two methods of research the following conclusion is presented: "The study seems to have resulted in an amplification as well as a justification of the results of psychoanalytic investigation. Psychoanalytic conclusions concerning the foster-child fantasy have stood the test of checking by a different method of research. At the same time it throws doubt upon the statement of Rank that the psychoanalysis of psychoneurotics is the only tool by which the imaginings of childhood may be studied. It is possible that the questionnaire might by itself never have discovered the foster-child fantasy and the family romance, but this study has demonstrated its usefulness as a tool for the checking of the results of psychoanalytic study and also for their amplification." [Author's abstract.]

Book Reviews

Róheim, Géza. SPIEGELZAUBER. Internationaler Psychoanalytischer Verlag, Leipzig and Vienna, 1919.

A book on folk superstitions is too often pushed aside even by the psychiatrist as having no practical place in the work of today. A few, however, have become students of folklore because they have found in records such as this one that which explains much of the disturbance of the mental life of the cultured individual of the present time. This book on mirror magic, the uses made of mirrors or other reflecting surfaces and the taboos associated with them, is well fitted to turn attention to the practical value of such studies.

The writer's style is compelling. He arrays his facts with those rapid strokes which denote a mastery of the material. He has gathered widely but he keeps his material distinct as to its sources, its geographical distribution and its varied illustrative value for psychic facts. It may sometimes seem to the reader unversed in the individual psychology of psychoanalysis that his interpretations savor of the arbitrary. But more careful reading will discover that the ample footnotes always provide for research into the literature of those who have revealed the principles of such psychology upon which the interpretation is based. These explanations are to a large part confined to the footnotes except where they form a topical setting for the material under review. In either case they are richly suggestive without being intrusive and they are expressed with the directness of one clear in his own understanding of the matter.

It is true that Róheim makes emphatic the value of this individual point of view as the starting point for such study of folklore and myth. The beliefs, customs, fears, taboos which have to do with the mirror are all related he believes, to the narcissistic level of individual evolution and to the peeping instinct closely associated with that. Since childhood is the period for this narcissistic stage of development it is not strange that many rites or taboos should be found in direct relation to children. Taboo and magic use being merely the reverse sides of the wish one or the other is found to express the same thing. The taboos and the dangers they represent are everywhere evidences of the fear which results through the necessary inhibition of the wish to remain at the narcissistic level and exercise its rights there rather than to pass on to the lessening of the exclusive valuation of the self in the stage of "object love." Not alone the superstitions relating to children but all those which pertain to the reading of the future, the close association with the ruler, who is the realization of the childish phantasy of omnipotence, the manifestations of fear surrounding the break-

ing of a mirror or its concealment from the dying or the dead, all bear testimony in one way or another to the unconscious overvaluation of the personality and the reluctance to relinquish this childish grade of libido progress. Yet at the same time they reveal the libido actually turning outwards to the object of the next stage.

This is shown particularly in the customs and beliefs which have to do with love charms, discovery of the lover in the mirror and the like. Of these Róheim has given a host of examples with which he has interspersed those explanatory words which reveal the unconscious conflict represented. Of equal interest are his suggestive interpretations which accompany the other customs mentioned in their particular associations. A valuable chapter is added on the relation of the heavenly bodies to the mirror in folk superstition. In this chapter as elsewhere the writer's presentation has made it easy for the reader to agree with him that psychoanalytic psychology has furnished a fruitful starting point for investigation. This by accepting the fact of narcissism as a critical point in the psychic evolution of the individual supports rather than overthrows the fundamental results achieved by an earlier folk psychology. It does indeed appear true "that the new method digs deeper than the old that it explains more and also discovers the most secret impulses which determine the psychic life."

Hamsun, Knut. GROWTH OF THE SOIL. Translated from the Norwegian by W. W. Worster, 2 Volumes. New York, Alfred A. Knopf, 1921.

There is more psychotherapeutic value in such a book than in a sojourn at the most salubrious health resort. For to the invigorating quality of its atmosphere, restful too in its simple genuineness, is added the stimulus of human lives utilizing their environment, mostly wrestling with it to bend it to their service. Isak the man is an individual not in the least afraid to be himself, a type of character to form by contrast a healthful reminder of the fundamental difficulty which is involved in the psychoneurosis. It is easy for Isak simply to find a satisfying expression in the life immediately about him partly because up there in the lonely wilds there is little conflict with social restrictions but also because apparently his nature is free from such complexities of its own as are fitted to create dissatisfaction. Later when the encroachments of the social order make themselves felt it is never he who succumbs to any domination of them. He is never seriously deflected from the path in which he is satisfactorily established. He has work enough to construct a home, an increasingly productive one, away in the wilderness. He has a wholesome faith in Providence suitable to his range of development but it never stands in the way of his own effort to adapt nature to his needs as soon as he understands that there is such a way for himself. There is some reluctance when he realizes that his power is waning and the stone he tries to lift defies his strength. But he has given freely to the son like him of his knowledge of nature and they have worked

sympathetically in the same direction so although he must relinquish his former feats of strength in favor of the younger man there is no more than a passing natural envy of regret.

Others of the characters have felt more disturbingly either the pressure of the complexities of their own nature or the more complicated interests of a society making its way in upon them. The older son Eleseus presents an example of an unsolved conflict between these forces. He is not sufficiently forceful within himself to utilize the elements of his own character in bending these of society to his own constructive uses. There is subtle suggestion in his character of the influence of the double sided *Œdipus* conflict which acts as an inhibitive force against his success. As with other characters Hamsun has not too consciously explained him, has neither blamed him nor justified him. He has left him very human, such a youth as one might meet any day and would meet with warmer sympathy because he has been portrayed here in the book. There is Oline, too, a far less well intentioned character. But one finds her story touched each time with a just suggestive pity for the deceptive cloak of well-meaning by which she almost hides her ill intentions from herself. One is moved to accept her with that truer sympathy which profits from a recognition of both the bad and the good forming the strange complexity of a life. For all the mischief of which she proves herself capable there however, she remains, a character making a strong appeal to the student of human nature.

Inger's experience with society swung her for a time out of her true path. By a crime she first experienced society's power to punish and then to atone in introducing her to many accomplishments which made difficulty of adjustment upon her return home. Her crime had followed very simply out of the secret suffering caused by a deformity, a harelip, which had deprived her younger life of much healthy outlet. So she had at once taken the life of the babe who inherited her curse. She sincerely repented what she had done, missing the little life that would have grown with her. Toward her husband and toward the law she was straightforward when confronted with the realization of the seriousness of her deed. The injustice of society's extreme action toward her is in contrast to the genuinely self-reliant acceptance of reality even of the wrong doing seen both in herself and in Isak. The committing of a similar crime by another woman leads the writer to put into the mouth of a would-be reformer an exposure of the exaggerated attitude of society. In the author's primary interest, however, in merely representing human lives as they are this other instance is one associated with a less deserving frivolity of character.

Inger and Isak are peculiarly free from a masochistic regret for wrong things done or good things missed. Inger throwing into her later blooming years some of the exuberance missed in girlhood follows the "god of the heart" into some of his "crooked ways" but very naturally. When her troubled conscience seeks peace in a confession to Isak there is after all no unnecessary self-accusation

nor self-flagellation. Neither one wasted strength by looking backward. "Oh, Isak had a strong, sound way of taking things; straightened them out, he did, when they turned crooked"—and then they both go their ways, individually apart but in loving interest in one another, strong together. In every character, in every incident there are the elements of human weaknesses sometimes but barely suggested. They give glimpses of the sources of disturbances and hindrances. Only suggested as they are yet their meaning becomes clearer in the light of the background against which they are thrown. This on the other hand offsets them with its wholesome possibility of human happiness in human independence.

L. BRINK.

Hollander, Bernard. IN SEARCH OF THE SOUL AND THE MECHANISM OF THOUGHT, EMOTION, AND CONDUCT. Volume I, The History of Philosophy and Science from Ancient Times to the Present Day; Volume II, The Origin of the Mental Capacities and Dispositions of Man and Their Normal, Abnormal and Super-normal Manifestations. London, Kegan Paul, Trench, Trubner and Co., Ltd., New York, E. P. Dutton and Co.

Title and volume of this work might at first glance suggest that a task has been undertaken of too formidable dimensions. Clearness or direct service to practical medical or psychological problems might be questioned. It is the bigness of the chosen subject and its comprehensive treatment that invite both criticism and commendation. Hollander reveals a mind capable of a large conception of the action of mind and body together. The study of one must include study of the other and each separate division of such study is only an incomplete portion of the whole picture. Time has brought many partial views both of the soul and later of the action or condition of the brain as if each were of final absolute value. This writer is able to gather these together in a continuous historical presentation but even more in a grasp of the subject which sees the genetic relation of each partial activity or each field of activity to the complete working together of mind and body. Hollander accepts the conception of brain as the instrument, of mind as the force behind it.

Minor evidences of the incompleteness which must reveal itself in a work with so broad a field confront one in the early historical material. The author himself has forewarned us of that. It would be impossible in the necessarily brief survey altogether to avoid a certain lack of interpretative statement of the ancient conceptions of man. The result is that the continuously developing growth of ideas is caught in a somewhat arbitrary snapshot manner, which seems foreign to Hollander's own conception of the history he is writing. Allowing for this effect of the necessary brevity of statement one reads with much interest the broadening of the earliest formed concepts into a more scientific consideration of the

problems physiological and psychical into which man advanced. The early philosophical science of the Greeks is presented, the views of mind and brain which extended on down through the Middle Ages, falling at last under the freer exercise of reason and investigation after the Reformation. Even then though there is increase in first hand scientific knowledge, the mystical theories of the Middle Ages bind this closely with philosophical speculation. It is only toward the nineteenth century that brain physiology becomes a more truly exact science.

This volume is in large part an assertion and defense of the important place held by Gall in the development of a science of the brain. His work is given in great detail along with the statements of his critics and of those who supported his discoveries and theories by the results of their research during his life and subsequent to it. The book has a cyclopedic value in its review of the seekers of facts through physiological investigation or psychological and philosophical speculation upon the mind. The space given to Gall's work emphasizes the conception of the functional relation of mind and brain which is Hollander's own correlating point of view. He is intolerant of that eagerness for exact knowledge which imprisoned in its laboratories loses "the outlook over the whole field of life from its windows." He strikes at a source of narrowness of comprehension when he says, "It is surprising with what slender evidence inquirers are sometimes satisfied, so long as the meagre testimony harmonises with their beliefs."

The second volume is an exposition of the writer's own investigations upon the great subject of the relation of the mental or as he prefers to call it the psychic life to the body, chiefly the brain. He avoids that slavery to the power of his own beliefs which prevents reversing or enlarging one's knowledge as well as one's opinions. He has given his own experimental observations along with the testimony of others in the field. He does not believe that one can rightfully study brain physiology without psychology at the same time. In all that he has said he leaves the field open for future corroboration or future correction by fuller knowledge. His effort is merely to stimulate interest along the paths he finds are yielding fruitful results and thus to indicate the openings for such ever broadening work. There are certain personal convictions to which he holds not stubbornly but because to him they represent workable problems yet sufficiently unsolved to offer much fruitful territory. In the brain territory there is much to be done although here science has been able to make exact progress. He keeps at the front always the merely functional significance of the various brain localities serving the force of mind behind them. In his acceptance of localities for the emotions there is a note of arbitrary mechanistic localization but this is doubtless due to a lack of sufficiently full statement of the same functional relation of these areas to the play of the emotions.

Hollander's treatment of the various forms of mental disorder tends to the descriptive, the method which separates them out too

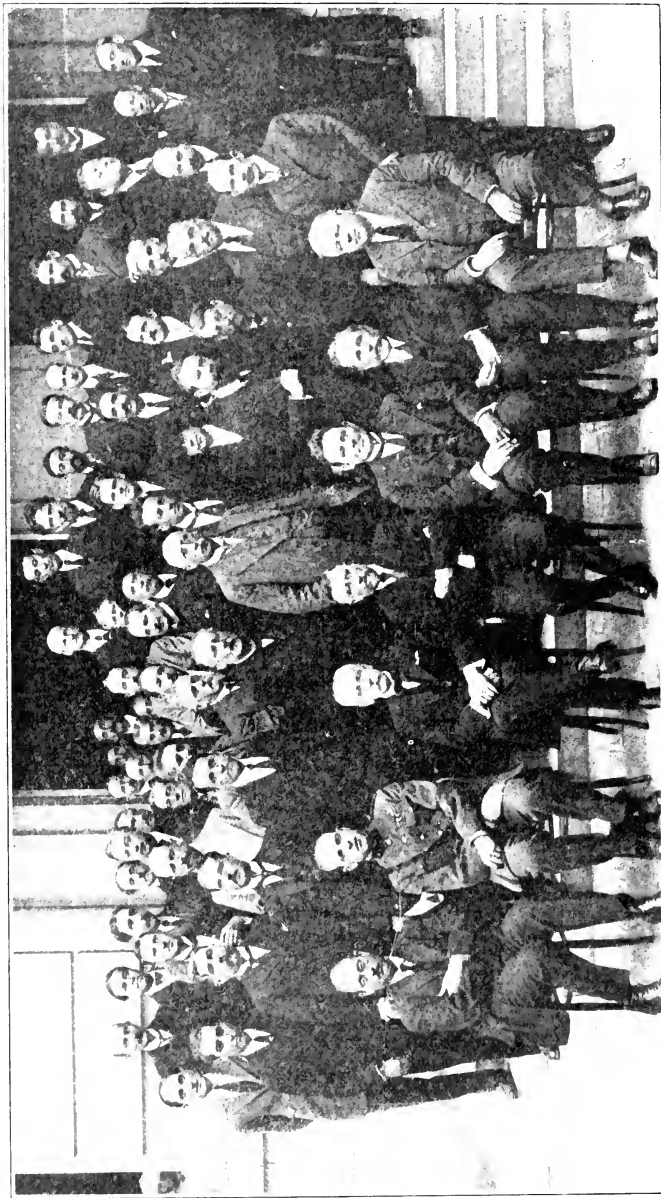
much as entities within themselves. He seems to support such an implication in his physiological statements. This is contrary to the spirit in which the book is conceived as a whole, but reappears in all his psychological discussion. Inspired as he is with the genetic point of view, he seems like so many thinkers unable to conceive fully of the origin and spread of psychic activity from a unified source out of which any variety and complexity may unfold itself. Here he differs with Freud's psychology and we hear as from other psychologists of the older schools of many instincts, of impulses or traits which seem to lack that connection at their root which Freud's simpler classification admits them to have. Hollander has not improved the situation by utilizing different terms to help out, instinct, propensity, impulse, nor has he added anything by reverting to the term ethology as a particular division of psychology which shall apply to human character and conduct. Failure to grasp the more synthetic dynamic viewpoint has left him in marked misunderstanding of the basis of Freud's theory and so astray as to the methods of psychoanalysis. He accepts the belief in the unconscious, although he usually speaks of the subconscious. He has not, however, cut himself or his readers off from fuller research or clearer understanding in any direction. His open attitude and the scientific direction in which his thought is directed are well expressed in his closing words: "Every particle of man is alive and adjusted in its function to the whole being, the self, and by his thought and emotion he can control not only his brain activity, but every function of the body, accelerating or inhibiting it. From this it appears to me that instead of saying 'man has a soul,' it would be more correct to say that 'man himself is a soul.' He is not a conscious machine, but a spiritual being."

Obituary

ERNEST DUPRÉ

The sudden death of Professor Ernest Dupré in September, 1921, removed one of the most active and original workers of the present day in French psychiatry. Although he had suffered from a prolonged illness he was able to participate in his former inspiring manner in the recent Reunion of the Neurological Society at Paris in June and Congress of Alienists and Neurologists at Luxembourg, in August. He was born at Marseilles in 1862 where his father was professor at the Lyceum. He received his education in Paris where the foundation was laid for his later exact and original work. He was well trained to pursue his work into the various channels into which his interest flowed as well as to exercise that perfect literary expression which characterized his published results.

His early career in medicine was distinguished by studies in biliary infections, in work on the parotid gland and the throat which already gave him a reputation for careful and original work. His early work in neurology was directed to a study of the meninges and was followed by research in practically every field of the subject. He felt however that all such work found its consummation in psychiatry. For he laid emphasis upon the somatic and psychic unity of the organism. He therefore firmly based his psychiatric conceptions upon the exact observation of facts anatomical as well as clinical which he collected widely with care. At the same time he perceived the affective basis of psychic disturbances believing that the imagination and the emotion were responsible for the pathological condition. His interest extended itself not only to the investigation of various syndromes manifesting these disturbances but it led him on into the fields of criminology and of sociology all as part of the broader psychology to which his studies belonged. He looked upon the study of the individual, whether as a pathological subject or otherwise, as only the beginning of a larger social psychology which should be the concern of all branches of social science. He presented his point of view in a most stimulating fashion as president of the Congress of Strasbourg in 1920 where he discussed the question of the interrelation of the mental disturbances and the en-



PARIS NEUROLOGICAL REUNION, JUNE 3, 1921. Dr. Ernest Dupré, third from left hand, front row.

vironment. He admitted the value of Freud's theories for certain isolated situations but in general rejected them because he believed them not sufficiently based upon fact.

Dupré has made many specific contributions in various psychiatric fields. A large volume embracing an enormous amount of research in the interrelation of psychiatric syndromes and anatomical lesions was published in the "Traité des maladies mentales" of Gilbert Ballet under the title of "Psychopathies Organiques." Other similar studies pertain to paresis, psycho-polyneuritis and presbyophrenia. His work on the relation of mental disability and lack of motor equilibrium includes a valuable study of the relation of psychomotor development and mental anomalies in the child.

Dupré's investigation of what he termed "mythomanie" led him to a conception of the hysterical state which is largely in accord with that of Babinski. Dupré has given special attention to the deliria of imagination, both those which are chronic and systematized and those which are acute and transient. He describes "puerilism" as a syndrome occurring in various mental disorders as either constitutional, transient or progressive. He has isolated in his study other syndromes which occur on an emotional basis. He has attempted also to separate out some of the syndromes of hysteria and of neurasthenia and has isolated a syndrome which he names an emotional psychoneurosis.

His untiring activity has resulted in works upon various subjects of psychiatric and psychological interest as well as in important contributions to medico-legal affairs. His work, original and creative as was its nature, was always founded upon observation itself rather than devoted to theory. As a teacher he embraced his subjects in a broad manner awakening the interest of his students and winning their affectionate coöperation. In his career as professor he brought his school to a position as a psychiatric center whose force was felt throughout France. He received various appointments to positions of honor and influence. He became associate professor in 1898, hospital physician and expert for the Paris Courts in 1899. His medico legal clinics at the Prefecture of the police were most fascinating for Dupré had a very brilliant style in his extemporaneous clinical expositions. Chief physician of the special Infirmary in the Prefect of Police in 1913. At the death of Ballet he was made professor of the clinic of mental diseases in 1917 and organized the service at St. Anne made memorable through the work of Magnan. The war made it impossible to get his service

into as satisfactory running order as he would have liked, but in the present year his laboratories under Pinel's guidance were beginning to take up the broken path of research. In 1918 he was made a member of the Academy of Medicine.

The present writer remembers him as a most charming host, a polished and courteous gentleman, and a student of psychiatry who was always receptive to new ideas and ready to discuss them which he accomplished in a free and singularly felicitous manner. French psychiatry has lost a singularly cultivated and charming representative.

SMITH ELY JELLIFFE

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Original Articles

THE PSYCHIATRY OF THE GREEK TRAGIC POETS IN ITS RELATION TO THAT OF HIPPOCRATES

BY JONATHAN WRIGHT, M.D.

For reasons which will become obvious as I proceed, it is quite impossible for me fully to meet the demands of an inference which the title of an essay, *The Psychiatry of Hippocrates*, would warrant. I must confine myself to a more modest endeavor, more in accord with my serious limitations. I have therefore thrown restrictions around my title and fall into line with what the editor has once or twice before admitted to these pages. In the last of two articles¹ which were fortunate enough to find places in this journal, dealing with prae-Hippocratic notions of mental disease, there was an excursion into paths of thought traced by the lines of the Greek tragedians, and in Euripides we came within sight of the beacon light of Hippocrates. This in form met the intimation of the title, but we have come to realize as the result of long and earnest study on the part of philologist, archaeologist and historian alike that practically Hippocrates stands for all Greek medicine before Aristotle. Some of the Hippocratic Corpus is perhaps older than Aeschylus and some of it plainly as young as Aristotle at least, probably younger. If in Aeschylus we get something almost matching the song of healing sung over the wound of Odysseus,² on the other hand we get in the younger but cautious and conservative Sophocles, still older than Euripides, himself twenty or twenty-five years older than Hippocrates, a sneer at the thought of it. In the

¹ Volume 52, Nos. 2 and 5.

² *Odyssey* of Homer, XIX, 1, 458.

Ajax we hear "It is not for a skilful leach to whine charms over a sore that craves the knife." In the rugged Aeschylus a few decades before we found him bowing to the knowledge of its popularity with the multitude and saying: "Over the victim is chanted this ditty to madden the brain." The audience, we may well believe, was different in its feeling from the one Sophocles so successfully appealed to. Already the latter foreshadowed the invectives of Hippocrates in the *Sacred Disease*. "By such sayings and doings they profess to be possessed of superior knowledge and deceive mankind."

Wilamowitz-Mollendorf,³ more than thirty years ago, wrote two portly volumes on the Greek tragedians with its central interest fixed on the *Hercules Furens* of Euripides. Much of the matter does not concern us and some that does I have already alluded to, some of it seems to me to force the analogy drawn by him with the sentiments of Hippocrates, but this is especially marked in the very valuable Kiel dissertation of Herman Harris,⁴ largely resting on the profound research of Wilamowitz. I am indebted to many suggestions to be found in both these admirable monographs. In the *Hercules Theseus* (l. 1232) makes this remonstrance against magic: "Why mortal! thou canst not pollute the heavens." This, as is pointed out, very closely parallels the feeling of the Hippocratic author of the *Sacred Disease*: "It appears to me their discourse savors not of piety as they suppose, but of impiety." Wilamowitz conjectures the *Hercules* must have been written somewhere near 424 B.C., when Euripides was perhaps sixty years old and Hippocrates thirty-five. I shall have something to say of it further on, but we may imagine the date of the *Sacred Disease* was later than this; perhaps it was from the hand of a son or a son-in-law or faithful disciple of Hippocrates, knowing a little more anatomy than the Master. He may well have derived from Euripides that bolder tone in the *Sacred Disease* which appears, though less prominent, in some of the older books, but he was plainly a greater radical than the cautious practitioner reveals himself in these. Indeed, Euripides was far more modern in many of his ethical views than any of the ancients. In the previous papers I have already referred to the responsibility he laid on the gods in the eternal religious question of the mystery of evil. Modern society taking the place of the gods, entertaining the views science furnishes it as to the rôles of heredity and environment in the drama of human life, is now perforce tacitly assuming

³ Euripides . . . Heracles, 1889, 2 vols.

⁴ Tragicæ Graeci qua arte usi sint in describenda insania. Diss. Inaug. in Academ. Kiel. Hermannus Harris, 1891.

that responsibility. Life easily became unbearable for the ancients under the stress of mental and bodily evil and in these conditions suicide was generally applauded, though not by the universal consent of ancient ethics. Ajax, in Sophocles's play, falls upon his sword at the dawn of day, following the tradition of the *Acthiopis*, but Euripides in the *Hercules* strikes the modern note after the frightful tragedy of the murder of his wife and children in his insanity: "Shall I quit life and haply prove me craven? . . . I will be strong to await death," and face "without flinching, misfortune's blows."

Sophocles, when a young man, was a rival of Aeschylus, and when he was an old man he triumphed over Euripides, and he may have learned something of Hippocrates even in the latter's life time, but I doubt if it was from the text of the *Sacred Disease*. Psichari,⁵ indeed, supposes that Sophocles, who was born in 495, and because of his long life, dying in the same year with Euripides (406), he was a contemporary of Hippocrates, knew the latter's works, being himself a priest of the god of health. He composed a paean in honor of Aesculapius and, the legend says, harbored him as a guest when he first came from Epidaurus to Athens. As a general he, too, had seen the sick and wounded, but still it is not to be lightly inferred the passage referring to whining a charm over a sore was inspired by the matter in the *Sacred Disease*. It is said by Daremberg,⁶ according to Psichari, though I have failed to make note of it in the works of that author, that such sentiments may be found in Alcaeus and Homer. As to the former ancient poet I am unable to say, but as to Homer it requires the enthusiasm of Daremberg to find them. We have long known sleep as nature's sweet restorer, but that "Hypnos knows not pain" is a reminder in the *Philoctetes* by Sophocles of the application of hypnotism in our day; to seek any more than an etymological suggestion in our day is no more futile than to attempt to find an analogy for it in Hippocrates, as Psichari does. Yet after a careful study of the evidence, urged by the writers referred to and from an opinion independently, though with some reserve, arrived at before I was acquainted with their comments, it seems to me that Euripides so often coincides with Hippocratic sentiment and doctrine, and even occasionally in phrase, it is impossible not to infer that the poet or the Hippocratic author borrowed one from the other, it being, of course, quite impossible

⁵ Psichari, Jean: *Revue de Philologie*, XXXII, 1908, p. 95. Sophocle et Hippocrate à propos de Philoctète à Lemnos.

⁶ Daremberg, Charles. *La Médecine dans Homère*, Paris, 1865. *Daremberg, Charles, État de la médecine entre Homère et Hippocrate*, Paris, 1860.

to say anything more than that Euripides was the older man and his works doubtless were very much more widely known throughout the Aegean than those of Hippocrates. Not to recognize there was an advance in the scientific methods of thought between Aeschylus and Hippocrates or Euripides, as Harris (l.c.) intimates, or as we might infer from others quoted, seems a blindness to the evidence. It is traceable—for instance, as to the use of the knife—from the Papyrus Ebers and the stele of Hammurabi through the Rig Veda and the Zend Avesta, on through Aeschylus and his followers, through Hippocrates and Galen, to falter only at the total collapse of the later Greek civilization. Then they began to sing songs again over wounds and juggle with amulets, but in the *Sacred Disease* this is anathema.

Not in ethics and religion alone do we find Euripides an iconoclast, but we see his thought running over into the domain of his younger contemporary in very many places and he met such serious hostility that he had to flee from Athens and the sentiment there of the conservative populace. In the history of science as the records of the ages are unfolded before us one by one the tiny sparks appear, which we recognize as our beacon lights. They flicker and go out and perhaps again and again appear, more luminous until they no longer sink beneath the horizon. We perceive them slowly spreading light around them. It is not a matter of one civilization alone, it is the recession and advance of many, each transmitting much or only something to its follower. It is a long trip from the dwellers on the Nile and the Euphrates, five thousand years ago, when magic reigned as supreme as science does now. It is only here and there along the road we pick up more and more the signs of advancing scientific differentiation. On the authority of Eustathius commenting on the *Iliad* (XI. 515),⁷ we have it that Arktinus in the *Sack of Troy*, written possibly before, more likely after the *Iliad*, but antedating the tragic poets and even the establishing of the Olympiad, represents Podaleirus as the first to note "Aias' flashing eyes and clouded mind, when he was enraged."⁸

In the *Hercules* the hero's countenance (l. 932) suddenly

"Was wholly marred with rolling eyes distraught
With blood shot eye roots, starting from the head
While dropped the slaver down his bearded cheek." (Way.)

⁷ I correct the reference to the lines in the *Iliad*, made in this volume of the usually carefully proof read Loeb's Classics. It was evidently Book XI (l. 515) not Book XIII, Eustathius was commenting on, where a leech is said to be worth many other men.

⁸ Hesiod, the Homeric Hymns and Homeric, tr. H. G. Evelyn White, Loeb's Classics, 1914.

This picture has been the standard poet's fancy of madness down to our own day, but I suppose it only occupies the mind of the modern psychiatrist as a small part of the composite of one of many varieties of mental aberration into which science, in an ever-extending differentiation, has divided it. It is not strange, then, or even a coincidence, that in the *Sacred Disease* the eyes diverge, the foam rolls from the mouth, the countenance is inflamed and the eyes are red, but in this treatise we find the picture of epilepsy often strangely confused with many other convulsive states. Indeed, in these citations we note only passing phases of many of them.

In the preceding papers I touched upon the question of heredity as it appealed to the ancient mind; in this I shall have occasion to note the perhaps unconscious differentiation of the tragic poets in the portrayal of the *Ajax* and the *Hercules Furens*, the latent insanity and acute mania, the mind perverse and morbid and the sudden violent idiopathic (?) ravings of a mind temporarily deranged. In the *Sixth Epidemics* of the Hippocratic Corpus (sec. 8, no. 31)⁹ we find it stated that "those having melancholia usually become epileptic, and epileptics are often melancholy; of these two diseases the form depends on the direction the disease takes; if it affects the body, it is epilepsy; if it affects the intellect, it is melancholia." It is quite evident from this that at least the connection between convulsive states and mental aberrations is established in the mind of the author, who, by the way, is supposed to be other than the great Hippocrates; his line of differentiation, I suppose, is rudimentary and theoretical in the extreme. Scientific analysis has not gone very far and perhaps had taken the wrong road. We get a nuance of things material and things divine still, but plainly differentiation had begun. It would seem also that in the *Sacred Disease* epilepsy is not only differentiated from some other convulsive states, but from mania itself and other forms of insanity. Though there is evident confusion in the thought in many places it is clear this gross distinction is made, for in elaborating the familiar theme that it is no more sacred than other diseases it is declared there are others where the etiology is as obscure, the daily, tertian and quartan fevers, for instance—"also I see maniacal and delirious men without manifest cause do a number of senseless acts, so in sleep others give vent to groans . . . and rave till awakened," and thereupon he gives vent to invectives against the magicians and charlatans who call the disease sacred, as though he grouped all these convulsive and maniacal manifestations in one category, within which further discrimination is

⁹ I use the Littré edition.

attainable. Since our knowledge of medicine of any kind existing before the Hippocratic era is so scanty, when we enter that era the student of medical history is impressed at the profusion of the records of theory and practice he finds in what has been preserved to us. So important, even though so specialized, a field as that of insanity and allied states we find already much occupied with analysis and discriminations which in themselves point to a stretch of time long antedating the Hippocratic epoch in which observations and classifications, rudimentary though they may have been, had been accumulating. To make even a summary of this with the discussions it would suggest would require a volume. Perhaps one already exists. The dissertation of Nasse,¹⁰ a hundred years ago, might with profit be employed as a memorandum from which to write one at least. To attempt such a thing would be preposterous for me, not only because of the exigencies of space, but of my capacity in psychiatry. I can only refer to a very few passages in the books of the Hippocratic Corpus, those chiefly attracting my attention incidentally in reading them as a matter of general historical régime.

It is unsafe to postulate evidence as to the extent of knowledge of the author of one book in the Hippocratic Corpus from the knowledge displayed in another book. In the *First Epidemics*, commonly regarded as a genuine book, we find reference to a decline in the systemic powers (the innate heat) as liable to result in paralysis and manias and blindness (second constitution, no. 6). So in the *Second Epidemics*, supposed to be spurious, biliousness and gout are responsible for manias, and it is quite clear, while this latter term lacks any precision or exact definition itself, epilepsy is not usually confounded with them, though also here the idea that they may all be the manifestations of some common cause does emerge now and then. We see them inclusive of delirium tremens in *Fifth Epidemics* (no. 2). It is noted in various systemic diseases as to the epilepsies and the manias, the former especially in children. Even in some of the older books of the Corpus (*Coan Praenotions*), possibly influenced by the ancient and correct doctrine of Alcmaeon, who placed the intellect, at least the centers of motion, in the brain, a doctrine from which the majority both before and after him so perversely differed,¹¹ it is commotions of the brain that give rise, not alone to the manias, but likewise to the epilepsies, as in the

¹⁰ De Insania, Commentatio secundum libros Hippocraticos—In alma literarum Universitate Borussica Rhemana MDCCCXXIX.

¹¹ I need not remind the reader that commonly the intellect and the passions had their seat in the heart—so also the centers of motion.

Sacred Disease, a much later book, and, as I have remarked, probably later than Hippocrates himself. The brain, it is there declared, is the origin of epilepsy and of other important affections. There are other than these anatomical reasons, however, for regarding it as later than Hippocrates II.

Religious mania has become an integral part of the study of psychiatry, although there are certain embarrassments encountered not infrequently in taking that view, and these latter we find much accentuated in antiquity. It must then have merged as often as now with other manias, but however bold some of the Hippocratic authors are in declaring epilepsy no sacred disease and in attributing other manias to materialistic causes, we get no suggestion that the religious furor of the Bacchantes and the innumerable sects, associated with Orphic legends by archaeologists, belong in the same class with them. Thus far apparently Hippocrates durst not go. The multitudinous references we get to such phenomena in the Mediterranean basin, going back evidently to the Brown Race and, we may reasonably surmise, to a negroid population, are very suggestive to us, not from studying the European Middle Ages alone, but they are very striking to those of us familiar with the ravings of "revivals" among the negroes and the conversions of our hardy frontiersmen in the Middle West, who feared no man or beast of the forest, but grovelled in the dust before the menace of an angry God and a burning Hell. They rolled in ecstasy on the ground or leaped with joy at the camp meetings at the prospect of salvation. The frenzy of the ancient Bacchantes thus becomes intelligible, and also, let us confess, the reluctance of the men of science of old to refer to such actions as craziness like unto other manias.

One is moved to say Euripides is the greatest etiologist of all time. He lays bare to us the great underlying causes in the cosmos which sway the lives of men as no one else has done, but he can make use of conventional ideas, whose errors in one play he has exposed, to exhibit in another a fresh display of the springs of human emotion. In the *Orcstes* and the *Hercules Furcus* he deals with insanity as a primary motive, in the *Bacchae* he accepts the primitive idea of the affliction sent direct from a god in order to expose in the most daring way religious frenzy. Near the end, after the tragic and horrible death of Pentheus at the hands of his mother and her sisters, the daughters of Cadmus, the latter exclaims (l. 1295): "Ye were insane and all the city frenzied." (Kerr.) Notwithstanding this modern standpoint, it is quite apparent that at the beginning of the play he is appealing to the prevailing ideas of

his audience to enlist their sympathies and their interest in representing the contagious ravings of the Bacchantes, when he makes the god Dionysus say because of the insult to his mother by her sisters, who said, not to Zeus had Semele born him, but to some mortal.

“Therefore I drove them raging from the house
 And frenzied now they hold the mountain height
 * * * * * *
 And all of woman kind among the Thebans
 All women maddened from their homes I sent.”¹²

“ . . . non cursu segnior illo
 per medias urbes agitur populosque feroces,
 quin etiam in silvas, simulato numine Bacchi,
 maius adorta nefas maioremque orsa furorem
 evolat. . . . ”

It is plain that at the end, after the story has been told, Cadmus sums up the poet's views in the line (1295) previously quoted and makes another differentiation of mental aberration, one not included among those physicians were supposed to deal with.

“They rush like furies honoring with dances
 Bacchus, the new made god . . .
 . . . but in sooth they worship Aphrodite more than Bacchus.” (l. 218-9)

We here get trace of the sexual excitement so often a feature of this infectious sort of religious mania, which it is still possible to study along the upper reaches of the Nile. As the scoffers used to say of the old camp meetings, so the rash Pentheus exclaims:

“One here, one there, they yield to secret love.” He cries shame to his grandfather Cadmus that he should “be sitting mid the Bacchanals bound,” and the chorus of the latter cry out: “Words impious!” The whole situation is familiar to us. Though the scoffers have not been torn limb from limb in modern days, as was the stupid Pentheus, it is largely owing to discretion in modern physicians, much accentuated in the ancient physicians by the greater danger, that trouble does not more often ensue. The will of the female fanatics towards such extremities is not always lacking. Pentheus's elders admonish the young radical not to venture on such dangerous ground and all politic men, especially political men, have avoided it. Euripides did not always act as prudently as he counseled in the antistrophe:

“Wise is it mind and heart safely to guard against
 Men who have over much learning attained.
 But what the scantily taught multitude
 Always sanctions and practises, this I too would accept.

¹² Doubtless the lines in Virgil, *Aen.* VII, 384-6, are reminiscent of this madness after the wonderful simile of boys whipping a top:

Such Bacchic frenzy came from Asia, the home of religions, as Africa is the home of the religious. It is interesting to note its greatest prevalence in the primitive times of Greece, when probably the traditions and the blood of the brown race filled the basin of the Mediterranean more fully than later, and also to find it cropping out in our African fellow citizens in their more primitive state during and after slavery times, but still persisting as a characteristic of the race.

To return to more orthodox forms of mental aberration, madness takes Hercules by surprise, but Ajax, apparently from experience, in the play of Sophocles, seems conscious of its paroxysms coming on him sent by Pallas, so much his enemy:

"The strong goddess torments me to the death" (l. 401). So the attack of epilepsy and the madness Aeschylus in the *Choephoroe* (l.l. 1018-9) strangely suggests with it is felt by Orestes to be approaching, and it is supposed by Harris that in the *Prometheus* in the form of the verse Aeschylus portrays the rising flood of madness in Ion, but the attack seems sudden enough, when in the midst of her first discourse she exclaims (l.l. 588-9):

"Ah, ah, there is a sting fly fretting me again,
the ghost of earth born Argos,—O, forbend—
as I behold the myriad visioned Herdsman. . . .
And the wax-compacted reed keeps humming in
my ears a drowsy strain."

Is this tinnitus aurium a prelude to a paroxysm? Evidently that is the significance of the phrase, but with this objectivity, so admirably and so often found in Aeschylus, goes the primitive man's theory:

"What is it O, son of Cronos, what offense that
thou hast found in me to harness me in these
afflictions and to harass a poor maiden thus,
distraught with terror of the driving sting?"

He also makes the presence of the Errinyes felt by Orestes rather than seen in the *Choephoroe*, but in the *Eumenides* he brings the Furies on the stage and has them hover around him, much more dramatic doubtless before his primitive audience, but less true to nature we moderns are free to admit. Have we, then, even in Aeschylus the split beginning between the old and the new etiology? Probably not. It is more reasonable to suppose some gained experience of efficiency, some exigency of art rather than science, which makes the divergence. For Aeschylus was first and last the artist, the greatest of dramatists, if we take account of how one

whose native tongue is that of Shakespeare is moved by his lines in these days, so remote from the passions and the point of view of antiquity. However, the point may not be devoid of interest in the history of the evolution of psychiatry. It may serve to remind us that even then there were two points of view as to the etiology of insanity, one the external or primitive view and the other the internal or modern theory. It is the same problem, often discussed, as to whether Hamlet really saw his father's ghost or only thought he saw it. Two admissible ways have probably always been in possession of the artist for use according as the exigency of circumstance of time, place and feeling dictates. Are we justified in thinking the feeling had so changed in the time of Euripides that, bold iconoclast as he was, he banished the Furies from the stage, and put their images only in the mind of Orestes in the *Iphigenia on Taurus* (l. 283), and in the case of Hercules veils the agency of Juno? It does not seem permissible to seek out a scientific consistency which had no place in the mind of either artist.

It is otherwise with the authors of the Hippocratic Corpus. In the *Sacred Disease* the point is made (no. 14) that it is by disorders of the brain we become insane, are delirious and fears and terrors besiege us. It is, however, clear that Euripides is nearer this standpoint than the older tragic poets, but he would not have been the great artist he was if he had failed to appeal to the ancient feeling in the interest of his art. The materialistic details of the new doctrine, as the science of the Hippocratic author gives them, do not lend themselves to dramatic treatment. Moreover, despite the break Euripides so often makes with tradition, the German critics more often force an analogy with Hippocrates where none exists. It seems almost sacrilege to place alongside these wonderful old lines the declaration of the author of the *Sacred Disease* that fundamentally cerebral disturbances of this kind are due to the bile or to a too great humidity of the brain, predisposed to it by the prevalence of certain winds and the coincidence of certain seasons. For us there is no great gain for science either.

Undoubtedly there is a bolder tone, a greater readiness to declare magic a sacrilege in the *Sacred Disease* than in the earlier treatise on *Airs Waters and Places*. As a matter of fact, the materialist agencies adduced in the former are open to derisory criticism now that we are out from under the spell of humoral doctrines. The author draws a sharp line, which in fact never had any existence between things divine and things material. The gods, we are to

infer, have nothing to do with the bile or the moisture of the brain or the winds. For my part, I much prefer the way it is put in the *Airs Waters and Places*. It is not only more cautious, it is more rational and consistent, more temperate, more in accord with the wonderful equilibrium of the Greek mind at its best in its best epoch. (Sophrosyne.)

The author of the *Airs Waters and Places*, which Jacoby¹³ and other critics believe is made up of several additions by other hands to some original book of Hippocrates, says: "I think this disease comes from the divinity like all diseases, of which one is no more divine than the other." In the *Sacred Disease* the phraseology is a little different: "It does not appear to me to have anything more divine or more sacred than the others." But the primitive belief is not expressed that all disease, like everything else, is divine; everything comes from the gods, and the implication of the passages that follow points to the view that there are many things not divine at all, among them disease. All things are divine, says Hippocrates himself, perhaps because it was not so safe to deny it in his day as in that of the author of the *Sacred Disease*, but we have other reasons for crediting him with the conviction that this is the logical conclusion, if we say anything is divine.

If there is a divinity behind anything in the ancient or the modern conception of that term, in a civilization arisen high enough to recognize the world is governed by law, relative or absolute, then it is only a question of how many subordinate agencies intervene between the first and the ultimate phenomena. On the assumption of the rational and fundamental conception, whether it means anything or not, thus formulated, it seems to follow that the consistent point of view is the primitive one; there is no line possible between matter and spirit which is not an arbitrary one. Science in modern days has strengthened rather than invalidated that assumption, however often that line has been drawn in some passing exigency of science or religion since Hippocrates' day. That underlies a part of the argument for the ascription of the *Airs Waters and Places* to an author who thinks straight, which is our ideal for him. This central thought is obscured, not perceived apparently in the *Sacred Disease*, and the supposition that it issued from a mind which, while more defiant to ancient conventionalities, wavered in its pursuit of the truth and faltered in circumlocutions and tautologies, though in possession of more anatomical information than that of the Master, is justified. We may be ready, if not eager, to bow to Mr. Einstein

¹³ *Hermes*, No. 46, 1911, p. 518.

and admit that all things are in reality relative, and the etymology of these two words suggests that this was known before his day; but so far as the human mind, when undismayed by apparatus revealing the extra-mundane arrangements, can go in this world, it should go straight, as the evidences of the senses direct, not curved to one side or the other by the attraction of novelty or repulsed by pique against conventions or by a hunger for the fame of originality and progressiveness. Personally I know nothing about the ultimate truth of any of these doctrines. I only want to point out the strength of the logical position assumed by the author of the older book in this matter of psychiatric interest and how it differed from that of the author of the *Sacred Disease*. It is one of the points used in the controversy as to the spuriousness of the latter that it shows the author had a mind inferior to that of the author the *Airs, Waters and Places*, but to pursue that argument would lead far beyond the confines of psychiatric interest and into territory in which I can claim no very expert knowledge.

A CORRELATIVE STUDY OF ENDOCRINE IMBALANCE AND MENTAL DISEASE

BY NOLAN D. C. LEWIS AND GERTRUDE R. DAVIES

(Continued from p. 405)

CASE 9.—American, male, aged forty-two, single, electrician.

Mental Diagnosis. Schizophrenia with paranoid developments.

Endocrinosis. Mixed thyrotrophic type.

History.—His parents were both alcoholic. He was the eldest of six sons and his father was cruel to him. His mother tried to protect him. The second son was a pet and the patient was jealous of him and abused him.

When he was ten he slept with his mother's sister, rolled against her, got an erection, and made copulative movements, at which she pushed him away. At puberty he began masturbating once or twice a week, but slowed down in later adolescence.

He was a daredevil and leader in stunts and mischief. At seventeen he was caught stealing coal from railroad cars and sent to reform school. He was unruly there and his one year term lengthened to three. He got a thorough education in crime but never made use of it. He learned perversions there, committing active pederasty and allowing fellatio and coitus inter femora.

At his father's death he was released from reform school. His mother sent him to her much respected confessor for spiritual advice, and the priest tried to commit pederasty on him and did commit coitus inter femora. This from such a source was a great shock to the boy, and he began to wonder if the priest tried to seduce his mother also. He never felt the same towards her again. He classed all the clergy together and lost his respect for the church.

After this experience he sought his first heterosexual intercourse, but never got much satisfaction. He had great fear of venereal disease. He felt inferior to his father and that he could never fill his place. At the outbreak of the Spanish war he enlisted, glad to get away.

After the war he returned to live with his mother, the other two sons either working elsewhere or being in charity institutions. He felt that humanity was cruel and life was a hard fight. He contracted gonorrhoea and feared his mother might catch the infection, so he ran away, leaving her in desperate circumstances. She died soon after, and his abandoning her weighed on his conscience.

He indulged in homosexual acts, always taking the male rôle. At twenty-five he married and had two children. He failed to get real satisfaction in coitus with his wife. Once he committed cunnilingus on her, and she committed much fellatio on him, but would not allow pederasty. He drank and gambled and had a hard time supporting his family. He decided he needed all his strength for work and stopped sexual relations. Then he began to suspect his wife of infidelity, and believed his employers were persecuting him. The records state that she said he refused to support her, accused her of immoral practices, tried to choke her once in her sleep, accused her of infidelity and swore the little son was not his.

He went into a psychosis and spent over a year in this hospital. He was depressed and suicidal and greatly feared impotence. He thought a good and bad spirit had possession of him at different times but his belief in his delusions was inconstant. After an operation for varicocele which he held largely responsible for his fear of impotence, he improved rapidly and was discharged as a social recovery.

For three years he was resident electrician in a soldiers home, but at the entry of the United States into the World War he got restless and worked in camp construction. After the war he returned to the employ of the men who he previously believed had persecuted him.

He met a poor widow with several children whose plight reminded him of his mother's and he was good to her as a sort of retribution for his neglect of his mother. Then he got erotic and tried to seduce her. After long resistance she finally ceded, but he found himself suddenly impotent. He projected the blame for this and became so excited that the police were called and he began his second visit to St. Elizabeths.

His delusions were not constant and he was usually willing to

discuss them. The main trouble was that his sex power had been sapped and he was sure it was due to something outside him. He busily invented hypotheses as to what had reduced his masculinity. He felt he had been hypnotized and driven insane for some foul purpose and he saw disguised secret service agents all around him. He sometimes suspected us of being they. He often suspected his difficulties were within himself, and once he said he didn't want to have any more talks with us for he feared we would destroy his belief in his delusions and he preferred to keep them. He dreamed of men masturbating him and committing fellatio on him.

His greatest temptations had been to murder his wife and the men he believed she had had relations with, and to commit fellatio and cunnilingus. He felt great remorse for his one experience with his wife. Passive pederasty had no attractions. Active pederasty and allowing fellatio he considered permissible and he had indulged in them weekly. He tried to be more masculine and with this idea in view let his beard grow and wore an army uniform he found. In his periods of partial insight he made such a good impression that he was given parole. He escaped and was heard of no more.

OUTLINE OF CASE 9

Behavior	Physical	Laboratory
Participant in overt sexual perversions.	Medium size with well developed muscles.	Wassermann negative.
Pederasty and fellatio.	Hair grey—scanty.	Blood pressure 140/90.
Reformatory school record.	Submasculine genital hair.	Blood uric acid 1.40mg.
Assaulted by priest.	Body hair scanty.	Blood urea 6mg.
Sensitive, unreasonable, worried.	General distribution of brown pigment over back.	Blood creatinine 2.50 mg.
Feelings of inferiority.	Perspires easily.	Thyroid test: Hypothyroid reaction.
Wife suspected of infidelity.	Hands and feet cold, slightly cyanotic.	Sugar tolerance: Mild hyperthyroid type.
Persecutions by employers.	Pulse 82—regular.	
Violent attacks upon wife.	Eyes protrude.	
Depressed—suicidal.	Pulse active.	
Fear of impotence.	Fine tremor of outstretched hands.	
Delusions inconstant.	Thyroid gland slightly enlarged.	
Hypnotic influences, sapping strength.	Troublesome diarrheas.	
Frequent misidentifications.		
Frank homosexual dreams.		
Periods of partial insight.		

There was no response to the thyroid test, thus showing that although the patient has a few of the characteristics of the hyper-

thyroid state, the thyroid testing rules him definitely out of this class. The highest pulse rate reached at any time was 96—98—90, the first one being on the first day and the last two higher points were reached on the day after, so were not particularly significant. The sugar tolerance test pointed somewhat more towards a mild hyperthyroid disturbance which may be temporarily compensatory to a more prolonged submyxedematous state. The patient was placed on 2 grains daily of thyroid gland for a short time during which he appeared lively, well extroverted, but insisted upon fasting a great deal of the time without giving a reason. His elopement from the institution terminated the treatment, before definite results were realized.

CASE 10. American, male, aged twenty-three, single, soldier.

Mental Diagnosis. Schizophrenia with projection on low grade moron basis.

Endocrinosis. Hypothyreosis with hypoadrenia.

History.—He lived a normal life on his father's farm until drafted into the army, and had never been separated from his relatives before. He was a great mother boy and used to stay in the house to help her.

He began masturbating at puberty two or three times a week. His first coitus was at eighteen with a prostitute. He had several more. Wet dreams were of normal intercourse.

In the army he found it very difficult to adjust to the new conditions. He reached France and was employed unloading freight cars. He got very tired sometimes. The first symptoms of his sickness were a numbness and coldness of his hands and feet, then trembling. These spells lasted an hour or two, and he claimed his mind was always clear. Then he felt smothered, couldn't breathe, didn't dare lie down, he thought he would die. Every bone in his body ached. Between spells he felt all right.

The army records state he grew depressed, emotional, resistive, worried over the recent death of his mother from pellagra, and feared he would die of it too. He begged them not to grind him to pieces in a machine.

On admission to St. Elizabeths he was disoriented, preoccupied, and resistive. He stood by a window for hours. He denied hallucinations.

For weeks after he entered our ward he stood by a window reading. He usually refused to answer questions and snickered a great

deal. By offering extra food the nurses induced him to work in the pantry. Two weeks later the occupational therapist got him to do wood carving, and he worked industriously and well. In January his intelligence quotient by the Terman test was fifty per cent., on the border between moron and imbecile. He denied having had any mental upset but admitted having felt nervous in France and suffering from shaking spells. He emphatically denied all the statements attributed to him in the records and insisted his mother was alive. His memory for recent events was excellent. In a physical examination he was very nervous, giggled hysterically, and all his reflexes were much exaggerated.

As he steadily improved, his snickering grew less and less, and he talked more freely. In May his intelligence quotient had climbed to fifty-eight per cent., middle grade moron. He was friendly and showed no resistance or fear any longer. He said that when he first entered this hospital he felt strange and lazy and wanted to be left alone, he didn't know who the people around him were and it was hard to know what to say to strangers anyway. He now felt better than he did at home before beginning army life and he weighed twenty pounds more.

OUTLINE OF CASE 10

Behavior	Physical	Laboratory
Original mental defect.	Short heavy type.	Wassermann ++.
Early difficulties of adjustment.	Face plethoric and hairless.	Blood pressure 115/60.
Hysteroid thoracic attacks.	Chest and abdomen hairless.	Blood uric acid 1.40mg.
Emotional—resistive.	Genital hair submasculine.	Blood urea 22 mg.
Worrying over death in family.	Erythema of local distribution.	Blood creatinine 1.60 mg.
Memory excellent.	Sexual organs normal size but flabby.	<i>Thyroid test:</i> Hypoglandular type of response.
Stereotypy of position.	All reflexes hyperactive.	<i>Sugar tolerance test:</i>
Hallucinations probable.	Podgy hands and feet.	Hypoglandular type of response.
Reads considerably and laughs to himself.	Anhydrosis.	
No insight.	Fatigue without energy expend.	
Gluttony.	Subnormal temperature.	
Intelligence 50 per cent. (Terman Scale).	Low blood pressure.	
Shaking spells.	Dermographia signs.	
Mirthless giggling.	Cold clammy extremities.	
Childishness.	Instability of sympathetic nervous system.	

His father came to take him home and told him his mother died while he was in France and they wrote him of it at the time. His amnesia for her death was complete so he had to go through the

agony of it a second time. His explanation of this was that the doctors, fearing the effect of the news on him must have intercepted the letter, but put the news in his records. He grieved deeply and said home would not seem the same without her.

On the third day of the test the pulse went as high as 120 but this rate was not characteristic of the fourth day, so was not significant. His efforts were all accelerated, he claimed to be feeling much better, began playing ball a great deal and began paying attention to his clothes and toilet. Recovery was quite rapid and he was discharged a cure, after two months thyroid and suprarenal treatment.

CASE II.—American male, aged twenty, single, laborer.

Mental Diagnosis. Schizophrenia.

Endocrinosis. Hypothyroidism plus hypoadrenia.

History.—Nothing can be learned of his family except that the father is a musician and the patient is the second of five children. A photograph of the mother shows a tense, high strung look. He reached the eighth grade at fourteen, then worked as an office boy and attended night business school for two years. He never failed in school work.

He was very imaginative as a child but also liked athletic sports. He craved money and pleasure and envied the rich as they rode by in their automobiles. He was sexually precocious and attempted heterosexual intercourse and fellatio at the age of eight, and struggled ineffectively against masturbation. As a child he had many fear dreams.

He joined the army at the outbreak of war and saw service at the front in France. It made a horrible impression on him, the noise, the maiming, the blood, and the danger of death. He was in the army of occupation in Germany, and it is evident that his psychosis began there, but it was not noticed and he returned home discharged, and went to work. During this period he was tempted by thoughts of sister incest and pederasty on his little brother. He tried coitus with prostitutes but only once was able to ejaculate. He indulged much in sexual fantasies and could get orgasms through fantasy. Finally he entered a local hospital voluntarily, saying his mind was getting torn up and he couldn't look people in the face, that there were all kinds of funny things in his head and voices just like conscience. He had many somatopsychic delusions. He was later transferred to St. Elizabeths and confined to bed. After a few weeks he improved and entered our ward.

He had partial insight into his voices and sexual delusions and said they might be only imagination. Sometimes he thought the strain of the front had made him "unnatural" and other times he thought his troubles were due to a period of life that every male goes through between youth and manhood and that he had emerged sufficiently from this period to be allowed to go home. He continually demanded his freedom and made attempts to escape.

He suffered greatly from fear, and a fine tremor was always noticeable. This fear was caused by what other people thought of him and wanted him to do, he said. He called on the Maker, the Creator for help when this fear assailed him. He had many symbolic delusions and fantasies of homosexual acts and became very agitated at any mention of such subject. It was evident he was both repressing and suppressing these ideas. Emotional blocking was frequent, sometimes wiping out fairly recent memories entirely. These fantasies both fascinated and repulsed him, and one could see the quick changes of emotion in his behavior.

In occupational work it was difficult to keep his interest. At the least obstacle he got discouraged and quit. He never finished anything. He cried over the harshness and cruelty of the world and reverted to calling his parents papa and mamma. He thought even they were too harsh toward him, and began to build up a fantasy of his not being their child at all.

OUTLINE OF CASE II

Behavior	Physical	Laboratory
Early day dreamer.	Small type of skeleton.	Wassermann + + .
Sexually precocious.	Skin poorly nourished,	Blood pressure $115/70$.
Fellatio at age of eight.	with dry scaly lesions	Blood uric acid, 1 mg.
Numerous fright dreams.	over face, neck and	Blood urea 24 mg.
Frequent incest thoughts	back.	Blood creatinine 3.6 mg.
and erotic fantasies	Hair scanty.	<i>Thyroid test:</i> Patient
with orgasm.	Pubic hair submasculine.	refused.
Auditory hallucinations.	Extremities cold and	<i>Sugar tolerance test:</i>
Somatopsychic delusions.	cyanotic.	Hypoglandular type
Partial insight.	Pupils dilated but react	of curve.
Numerous fear reactions.	quickly to stimuli.	
Notable religious color-	Reflexes all very slug-	
ings.	gish.	
Frequent emotional	Syncope during exami-	
blockings.	nations.	
Feelings of unreality.	Faints frequently.	
Fluctuating interests.	Protuberant abdomen.	
	Anhydrosis.	
	Headaches and giddiness.	
	Hypotension.	
	Myasthenia.	

His chief desire was to get home, and one could see he reasoned

that if he were not sick there would be no cause to hold him here. Consequently he refused to cooperate in a psychoanalysis or in glandular therapy, maintaining he was not ill and needed no treatment. Finally he could not face the fact that he was practically incarcerated and he imagined he was free to leave when he pleased and asked for a ring of keys. Constantly reiterated explanations that a patient of course could not have keys made no impression on him, and within a few minutes he would courteously ask for his keys again.

Apparently because of some delusion the patient politely refused to take the thyroid test capsules, arguing that there was nothing the matter with him mentally or physically and that the ingestion of these medicines would be only a waste of time to the experimenter and subject. No amount of persuasion could alter his judgment in this matter.

He cooperated readily in the sugar tolerance test. As the patient could not be persuaded to take medicine in any form, treatment was not arranged, and he remained in the above condition. However, the case is still one of great interest, as it well illustrates the type in which one would expect results from glandular therapy.

CASE 12. American, male, aged twenty-nine, no occupation.

Mental Diagnosis. Defective epileptic with schizophrenic features.

Endocrinosis. Dyspituitarism.

History.—Being the first child and born defective he received more care and devotion from his mother than would a normal child. The family tried to protect him from teasing, and taught him at home, not sending him to school. He can only read large print. His first seizure occurred at nine when his father was expected home after a two-year absence. His arrival was delayed day by day, and finally the patient cried in vexation "I'm tired of waiting for him," and fell into a fit.

At eleven a girl over twenty tried to have him perform coitus and pederasty on her, but he was unable to do so. He never had another heterosexual experience, and was bashful with girls. He felt that an erection pulled his brain but that after circumcision at twelve it didn't pull so much. Sometimes at the moment of orgasm he felt a pulling on the brain and temples and a little pain over the eyes. At twenty-four he played sexually with a brother nearly his age. They masturbated each other and he committed pederasty on

the brother but when the brother tried it on him it was too painful and he forced him to change to coitus inter femora. He also committed pederasty on a small boy.

All these years he lived with the family, the constant companion of his mother. Three years ago during the war he got to worrying over his father's danger in France and hallucinated his dead face in a coffin. His increasingly severe seizures culminated in a very serious one followed by a psychosis. He was removed to a sanitarium. He attributes this breakdown to worrying over his father and to masturbating daily for a year. After recovering from the psychosis he reduced masturbation to once a month.

During the psychosis he imagined he was a female in coitus with her husband, an unknown male, or the sun. He could feel the male's semen enter his body. He believed that male and female were joined together in his body, and he drew in illustration a sort of swastika of two arms and two legs united at his abdomen, and he named the limbs north, east, south and west. North, east were above and to the right, and were of heaven and good; south and west were below and to the left, and were of hell and bad. To the right were five circles of stars and to the left one line of stars. The swastika became a nude man, himself standing in a box, and the pores of his skin were as big as if punched by a finger. Through these pores the devil tried in vain to inject evil into him.

Then his mother died, and he heard her calling him out of the West and he answered he was coming. He saw her standing beside God in heaven. Angels transported him thither, and God said that he was one of his finest creations while his mother beamed in pleasure, an obvious compensation for his actual sorry condition.

He recovered from the psychosis, but still had the epileptic seizures. They are always preceded by an aura, "first the nerves of my fingers and feet grow dead, then my head buzzes and roars like a train of cars inside you, lights whirl in front of me like giant pin-wheels and the numbness gradually covers my whole body."

He is very religious, always has a bible on hand, reads it to ward off ill luck, is scandalized at swearing and reproves it severely. He takes it upon himself to supervise the morals and behavior of other patients and frequently gets into trouble as a consequence. In spite of his terrible affliction he is happy. Fortunately he has repressed the realization of his inferiorities. His looks and behavior are younger than his age. He follows one around like an inquisitive child, interrupting any conversation with an always ready opinion on every subject. His sense of humor helps him over many rough places.

Since his mother's death he has begun to emerge from the bisexual, mother fixation stage and is becoming heterosexual. He became infatuated with one of the occupational therapists and dogged her footsteps, dreaming he was to marry her, or that he had married her and had died, and that she was looking at his corpse in sorrow. He now believes that young women are crazy over him. He has never had a heterosexual coitus dream in his life.

OUTLINE OF CASE 12

Behavior	Physical	Laboratory
Epileptic youth with grand mal attacks.	Slender skeleton. Oxycephalic head.	Wassermann negative. Blood pressure $120/60$.
Numerous homosexual perversions.	Arrested body development.	Blood uric acid 1.80mg. Blood urea 18 mg.
Pederasty with both sexes.	Teeth irregular and notched.	Blood creatinine 1.50 mg.
Bashful—self conscious.	Gothic palate.	<i>Thyroid test:</i> Hypoglandular in character.
Visual and auditory hallucinations.	Rounded limbs. Tapering fingers and toes.	<i>Sugar tolerance test:</i> High at end of second hour and dropped normally.
Compensation dreams and visions.	Morel ears.	
Extremely religious.	Smooth delicate skin.	
Feels responsible for morals of other people.	Chronic otitis media.	
Pronounced erotic day dreaming.	Tonsillar hypertrophy. Bilateral internal strabismus. Pulse 92—soft and compressible. Coarse finger tremor. Deep reflexes are retarded. Abdomen protuberant. Incoordination of muscular activity. Numerous facial tics. Shambling gait. Congenital speech defect. Increased salivation.	

This patient has been on whole gland pituitary for about two and one half months with a reduction in the epileptic seizures from several weekly to two per month and those rather mild in character. In general he appears better nourished, and an improvement is noticed in his muscular coordination.

CASE 13. Italian, male, aged twenty-five, single, cobbler.

Mental Diagnosis. Schizophrenia with affective features.

Endocrinosis. Periodic hypoadrenia.

History.—Nothing is known of his family. He was born in Italy, had some schooling, and worked as a farm hand, tailor, and shoemaker. At seventeen he came to America to see the world, and

worked as a shoemaker, wandering from city to city. He felt lonely and homesick and worried a great deal. What would become of him if he should get sick with no one to look after him?

He admitted masturbation but said it was bad for one. He had never had heterosexual intercourse for fear of disease. When he was old enough he had intended to marry. He had had wet dreams as often as every night and they frightened him very much until a druggist told him not to worry about them, that they wouldn't hurt him, and gave him some pills. He denied perversions.

He was drafted into the army and deserted twice. The second time he was found wandering in a confused mental condition and taken to a hospital. Two years ago he reached St. Elizabeths. The records state he was catatonic with waxy flexibility, disoriented, and showed echolalia. He bumped into objects unless guided. Four months later he became excited and went naked, then again became catatonic. Later on, he showed signs of delusions of persecution, and was slow and negativistic with occasional periods of excitement and combativeness. At first he heard insulting voices, but they changed finally into harmless ones that said only good things. He tried to think only of good things.

At first he alternated rapidly from happy to depressed states. Often the periods changed daily. While euphoric he played games, laughed, sang and worked industriously. While depressed he worked slowly and silently or sat or stood idly in one place for hours, often refusing to eat. He was always wilful and stubborn with no idea of adapting himself to the people around him. He was very saving and stuffed his clothes with all sorts of trash.

After the first glandular feeding he went three weeks without a depression, while hitherto they had come nearly every other day. Then they came somewhat more often but not nearly so frequently as before, and they were not so deep. Usually he would still work during them.

He has a dainty, effeminate walk which is very noticeable. He complains of headaches and says he had them before entering the army. He says he no longer hears voices. On account of his very poor English it is difficult to learn much from him except by observation.

A notable feature of this patient's condition is the periodic appearance of large irregular patches of bronzing which are distributed particularly over the face, neck and chest. When he is in a depressed state these spots are vivid, but when in excitement the pigments are very pale and sometimes absent, thus acting as an indicator of the affect in control.

OUTLINE OF CASE 13

Behavior	Physical	Laboratory
Lonesome worried youth.	Slender skeleton well muscled and usually in great activity.	Wassermann negative.
Army deserter.	Pulse 100.	Blood pressure 188/75.
Mental confusion.	Feeble heart action.	Blood uric acid 1.83 mg.
Excited periods alternating with catatonic state.	Periodic appearance of large irregular bronze skin patches over face and neck.	Blood urea 15 mg.
At times picture was one of pure depression.	Dermographia.	Blood creatinine 2.86 mg.
Waxy flexibility and echolalia.	Reflexes exaggerated.	Thyroid test: Not performed.
Occasional delusions of persecution with combativeness.	Pupils dilated.	Sugar tolerance test: Curve of hypoglandular type.
Heard insulting voices.	Periodic asthenia.	
Often daily periods of alternating excited and depressed states.	Subnormal temperature.	
An industrious worker during excitement.	Anorexia.	
Willful—stubborn and hoarding.	Cold extremities.	

Because of the excitement and high pulse rate produced by any manipulation of the patient it was deemed somewhat dangerous to perform the thyroid test, so it was dispensed with. He was placed on two grains of suprarenal daily and at first showed an increased psychomotor activity with prolonged excitement. After twelve days he had a mild depressive reaction during the day and these depressions from then on became shorter and the manic reaction much lessened in violence. A few days later he became an extroverted, cheerful worker with hypomanic push in all activities. He now has short periods of depression lasting for an hour or so in which the pigments of the face show prominently. He is interested in games, and work, is more aggressive, and pugilistic and the depressions are becoming less and less in frequency and duration.

CASE 14. American, male, aged forty, married, army officer.

Mental Diagnosis. Schizophrenia.

Endocrinosis. Hypothyroidism.

History.—He is an old deteriorated patient and has been here six years. His father, a chronic alcoholic, died at the age of forty-one. His mother died at forty years of age of tuberculosis. A sister who visited him had peculiar mannerisms. She denied any mental disease in the family.

At twelve he was kicked in the head and had so-called brain fever for several months. He left school at fifteen and spent several

years at home, doing nothing. After working at different jobs he joined the army at twenty-three and remained in it ten years until his sickness, eight of which were spent in the tropics. At twenty-nine he married, but had no children.

His chief pleasure as a boy, he said, was masturbating. Around puberty he had all the intercourse he wanted with a thirty-five year old servant in the house. Two years before the psychosis he was sick for a month, restless and sleeping poorly, and having dreams that frightened him badly (subjects not stated). The psychosis started by his getting worried and depressed and feeling unworthy. One day he rushed out of the dining room in great excitement, saying his throat felt sticky and he was choking (probably a fellatio memory). He dreamed he had killed his wife, and then feared she had married some other man. Voices accused him of bad things, and he felt he would be killed.

During his six years stay here he had steadfastly maintained that he was unworthy to live. He said he was mad at himself and that he was the cause of his nervous trouble. He had a habit of "interrupting his talk to churn his tongue in his mouth, stick it out, roll it about on his lips, and then resume talking." He stood in one place for hours. He was an untidy, quiet patient except in occasional bursts of anger when he would roundly abuse some imaginary person, though sometimes looking at anyone near him. Conversation with him was impossible. He would gaze at one with a strange, impenetrable smile, start many sentences and seldom finish any. It seemed as if he wanted to divulge something but always stopped just in time. He constantly used the phrase "nice and clean." ("What about dirty?" I asked.) "That's all the trouble," he replied. Once he said a man called him good looking and wanted to marry him, and then added that I looked like this man. Another time he said he had been sort of married to everybody and that these "pimps" around here called him a fellationist. He dreamed of normal coitus, "nasty things" and of money with which he bought lots of clothes and other articles. When asked why he went around with trousers unbuttoned and genitals half visible, he replied that "they ought to look at it."

He could not remember any weaves in basket making, nor would he work more than a few minutes. He played cards but would play out of turn. His greatest delight was to get a pencil and scribble numbers on a sheet of paper. (He had acted as commissary in the army.)

After being fed thyroid he became much more irritable and some-

what more active. His wife said he talked to her more freely than for years. His scolding fits grew worse.

OUTLINE OF CASE 14

Behavior	Physical	Laboratory
"Brain fever" in youth.	Medium sized man with protuberant abdomen.	Wassermann negative.
Chronic masturbator.	Extremities slightly cold.	Blood pressure $145/80$.
Worried, depressed.	Pulse 64.	Blood uric acid 0.90 mg.
Feelings of unworthiness.	Body covered by discrete macular scaly lesions with apical bleedings.	Blood urea 26 mg.
Hallucinating insulting voices.	Erythemia of face and cervical region.	Blood creatining 2 mg.
Feelings of stickiness in throat.	Hair fragile—thin.	<i>Thyroid test:</i> Typical hypoglandular curve.
Peculiar mouth and tongue mannerisms.	Large amount of dandruff.	<i>Sugar tolerance test:</i> Hypoglandular curve.
Stereotypy of position.	Beard very scanty.	
Untidy.	Pupils extremely small (myosis).	
Occasional bursts of anger with cursing.	All reflexes sluggish.	
Peculiar staring facial expression with fixed smile.	Gait slow—regular.	
Thought that associates called him fellationist.	Slight arteriosclerosis.	
Unable to learn simple basket weaving.	Deficient action of sweat glands.	
Disinclined to exertion.	Constipation.	
Unoccupied.		
Answers unintelligently.		
Attempts correspondence unsuccessfully.		

During the thyroid test he became somewhat more irritable and more active. At this time his wife visited him and he talked more freely to her than he had done for years. Twelve days later after being placed on four grains of thyroid gland daily he appeared much brighter and conversed about Christian Science and paid more attention to his physicians. After receiving thyroid extract for two weeks longer he was able to pursue a connected conversation and answer questions fairly well. This improvement was not permanent, and he has gradually settled back into his old mental attitude, but his skin eruption and general physical appearance has remained decidedly improved.

CASE 15. American, male, twenty-six years old, single, sailor.

Mental Diagnosis. Schizophrenia with paranoid developments.

Endocrinosis. Hyperthyroidism.

History.—His family history is negative. He reached the eighth grade in school at the age of sixteen. He didn't get on well there

or in the various machine shops and factories he worked in later. No one treated him right, family, teachers, foremen, or fellow workers, they were all down on him and wouldn't help him. He had expected big jobs and big money but got only disappointment. He liked his father and brothers better than his mother and sisters. He felt particular resentment against his mother and her treatment of him.

He was bashful with girls and never had a best girl. That was all foolishness. A wife was only a moneysucker. He was too clumsy to dance. He had never had any sexual experiences except masturbation.

When in danger of being drafted into the army he enlisted in the Navy, and had a dreadful time. The other boys made fun of his short stature, his clumsiness, and his table manners. He felt inferior and that everyone was down on him. After a year's service he was removed from duty. He was tense, nervous, untidy, defecated in his trousers and thought the other fellows had it in for him and talked about him behind his back.

He thought he was sent here to be discharged from the navy and was furious to discover it was an "insane" hospital. He saw nothing the matter with his mind.

His attitude was one of suspicion and hate. He made friends with nobody and rebuffed every friendly advance. His eyes followed people around furtively and he often laughed to himself. It was with great difficulty that any information was obtained from him. Questions on sore subjects aroused almost diabolical hate. One expected him to leap at his throat, but he never actually raised a finger against anyone, though he cursed and looked as if he would enjoy torturing him.

He told with intense emotion how he had been "guyed" in the Navy. He still believed his mind was all right but he couldn't think as fast as he used to. In the Terman test his intelligence quotient was seventy-five per cent. When he reached the harder problems and realized he was failing, he got very angry. Apparently this has been his reaction to failure throughout life, and he then projects the blame for it on others.

He has been impotent since he entered the hospital. His wet dreams were of accidents to which he was an interested spectator. Wagons and motor cars ran away, tipped over, and spilled their meat passengers breaking their legs. There was much blood. He denied dreams of women. Another typical dream was of work, work, working in the shop.

In occupational work his shyness hampered him. He hesitated to ask questions and went to pieces when things were wrong. His work was fair. Sometimes he was so ugly that the instructor would ignore him for a few days.

In April he seemed less hateful and more contented and even said good morning once to the occupational therapist. In May he told the nurse that people didn't bother him as much as they used to. He seemed pleasanter. Then he masturbated a great deal and seemed depressed. In June he improved greatly. His mind seemed clearer, he became good natured, smiling and neat, took good care of his clothes, worked willingly, stopped his masturbation, and showed no more fear and hate. He said no one bothered him any more, and that was why he didn't swear. He never would tell in what way people had bothered him.

OUTLINE OF CASE 15

Behavior	Physical	Laboratory
Moderate mental retardation.	Short heavy type of body.	Wassermann negative.
Chronic masturbator.	Large head and neck.	Blood pressure $138/60$.
Bashful when near opposite sex.	Skin dry—covered with fine white scars and papillary eruptions.	Blood uric acid 0.8 mg.
Feelings of inferiority.	Trophic disturbances of nails and hair.	Blood urea 16 mg.
Postures tense.	Some scaliness over elbows and knees.	Blood creatinine, 1.20 mg.
Untidy—defecating in clothes.	Pulse 78.	<i>Thyroid test:</i> Typical hypothyroid curve.
Auditory illusions.	Extremities cold.	<i>Sugar tolerance test:</i> Hypoglandular reaction.
No insight.	Marked photophobia.	
Attitude of suspicion and hate.	Deep reflexes all markedly hyperactive and reinforced.	
Often laughs to himself.	Subnormal temperature.	
Projects blame of failures on others.	Protuberant abdomen.	
Quiet, sitting motionless for long periods.		
Alert facial expression.		
Speaks only when addressed.		
Disinclined to exertion.		
Occasional gestures.		

During the thyroid test his facial expression changed from evil to more pleasant features and he was considerably more active physically. After two months' treatment with one grain of thyroid gland twice daily his condition was strikingly in contrast to his former state, as during this time he had changed from an angry-looking, threatening lazy individual to a pleasant bright, spontaneously speaking, friendly person who paid more attention to the condition of his clothing, and appearance, worked more industriously at basket making and showed physical improvement. He has been discharged from the hospital.

CASE 16. American, male, aged twenty-nine, single, soldier.

Mental Diagnosis. Schizophrenia with projection.

Endocrinosis. Hyperthyroidism.

History.—He was a boy without much ambition and did not do well in school. He left when fourteen, having reached the fifth grade. He began masturbating when eight and did it daily at one time, but finally broke the habit off entirely. He was bashful with girls and never had a best girl. Sexual intercourse was not much of a temptation. He worked pretty steadily at various jobs but often lost them through physical illness.

At the outbreak of war he enlisted in the army and spent eighteen months in Panama. The hot climate enervated him. He had his first sexual intercourse there but got very little satisfaction from it, and greatly feared venereal disease. He never committed perversions. After discharge from the army he went back to work.

One night he felt as if in a trance, as if electricity filled his body. He saw visions, heard voices and loud noises, and had many queer physical sensations. His dead mother's voice said "This is my son." For a week he kept at work in spite of visions and voices then quit and was sent to hospital.

He was awkward, restless, and emotional, once bursting into tears when he had made a mistake in basket weaving. He said he often felt hateful, like springing at people and beating them, but his behavior was unvaryingly good.

He dramatized his good and bad impulses, and his talk was very rich in symbolism. The hallucinations came only at night, but no amount of argument, explanation or ridicule could shake his belief in their reality. The Masons, who were in league with the devil, came to his bed at night and tried to get him to join their order and indulge in their orgies of fellatio and cunnilingus, but he resolutely refused. Visions of saints and angels came to his assistance, and he developed a religious grandiosity. (His mother had been an Irish Catholic and his father a German Protestant belonging to the fraternities which the patient disapproved of as anticatholic.)

He was sure his eyes and testicles were removed in his sleep, and he thought his father had been similarly treated. He felt something go down his body from his head and out through the pubic region. Voices compared mouth to vulva and wanted them to kiss each other. He lost the power of erection and had only one night orgasm in six months.

Following a severe infection which resulted in the loss of a

thumb his psychosis disappeared. He saw no more visions and the voices gradually died away. He said there had been something inside him, talking, tempting, and trying to control him, but he had fought it. "There was a struggle on all the time but I won out and now it is all gone." "If I had not fought it, I probably would have gone and done those bad things they wanted me to."

A psychological explanation of the phenomena was given him but he obstinately rejected it. The visions, voices and feelings had been real, but now were gone, that was all. He preferred to regard them as supernatural.

In two months he was back in his hallucinations and delusions. They were not as yet so well formulated as before the normal interlude, but there was a woman inside him, something trying to drive him crazy, set him wild, and the voices were calling him a Protestant. His nights again became peopled with demons, bats, and angels. By day he was listless and indifferent, sitting alone on the grounds.

OUTLINE OF CASE 16

Behavior	Physical	Laboratory
No boyhood ambitions.	Slender type of body.	Wassermann negative.
Mentally retarded.	Muscles constantly under tension.	Blood pressure $145/80$.
Deficient potential.	Gothic palate.	Blood uric acid 2.4 mg.
Feelings of electricity through body.	Elongated head.	Blood urea 20 mg.
Auditory and visual hallucinations.	Flushing of skin.	Blood creatinine 1.92 mg.
Fantastic day dreaming.	Perspires easily.	<i>Thyroid test:</i> Hyperthyroid reaction.
Sexual perverse fantasies.	Pulse rapid.	<i>Sugar tolerance test:</i> Delayed absorption type of curve. (Hyperthyroid.)
Protective religious grandiosity developed.	Radial arteries slightly sclerotic.	
Symbolic castrations.	Nontransmitted systolic mitral murmur with occasional extra systole.	
Thoughts exceptionally rich in sex symbolism.	Thyroid enlarged about one-third bilaterally, isthmus easily palpable.	
Tired, listless—apathetic facial expression.	Moderate tremor of fingers.	
Rarely speaks unless addressed.	Reflexes greatly exaggerated, almost a clonus produced.	
Sits rocking greater part of day.	Moderate exophthalmos.	
Disturbing dreams.	Dilated pupils.	

On the third day, the thyroid test was interrupted owing to the marked irregularity and rapidity of the heart, the pulse reaching 120 per minute, and the occurrence of respiratory and general nervous phenomena which placed the individual definitely in the hyperthyroid group.

Treatment was suprarenal and pituitary glands together with

sodium arsenate, calcium oxylate and the phosphates produced decided change for the better in his physical syndrome, and mentally he did not appear as dejected, but was still governed by painful delusions. He had more insight, said the ideas were foolish, but he could not control them well. Worked excellently and read more.

CASE 17. American, male, aged twenty-one, single, sailor.

Mental Diagnosis. Schizophrenia with projection on low grade moron basis.

Endocrinosis. Hypopituitarism, and hypothyroidism.

History.—His mother was said to be nervous and had spells during which she “sat down and took things easy.” A sister had hysterical spells after which she was confined to bed for days. He was the youngest of several children and his mother’s pet. She and the church taught him a strict code of morals.

He reached the fifth grade in school at fourteen years of age, then worked as grocery boy, teamster, or expressman for various employers till he joined the Navy at twenty.

He masturbated two or three times a week, had his first heterosexual intercourse at seventeen and often since. He never committed perverse acts. In the Navy on account of his dullness he was much teased by other boys. They told him he must make a lot of money with his fat “rear.” This upset him badly but he “sassed them back.” Within four months he was in a psychosis. Navy records state he had auditory and visual hallucinations, somatopsychic delusions, delusions of persecution and of having syphilis, his speech was incoherent, he was disoriented, restless and obsessed with the idea he had been forced to commit some sinful act.

He told us he had felt he had committed some great wrong and feared damnation for it. He had seen heaven, angels, the devil, and his mother’s face in the sky and heard voices, but before entering our ward had “stopped all that stuff.” He was very emotional on entering our ward in January and ready to weep at thought of home and mother or of the way people treated him. He always had a new funny feeling or ache to ask about and examined his phlegm and feces, being much worried over his body. His intelligence quotient in the Terman test was 54 per cent. He sat and lay around, refusing to do occupational work. By rewards of extra food he was induced to work in the pantry. He had delusions that men committed fellatio and pederasty on him in his sleep, and he feared he might become pregnant in his rectum. Then he had

sensations of fellatio when he saw other patients move their lips and tongue. He thought they had improper wishes toward him and attacked two of them.

In March the three day thyroid feeding test worked an amusing transformation in him. He suddenly woke up, took up basket making, and worked industriously, and became correspondingly alert in other ways. He was placed on thyroid and pituitary extracts.

The homosexual delusions were things of the past, and he was rather amused at having had such funny ideas. He said he had had a little headache about that time and a tickling in his ears and thought his mind was being read, but now he felt perfectly well. He improved steadily and behaved quite normally. In May his intelligence quotient had increased to 63 per cent. He was discharged in June as cured.

OUTLINE OF CASE 17

Behavior	Physical	Laboratory
Moron.	Tall, weight 173 lbs.	
Auditory and visual hallucinations.	Small round head.	
Delusions of syphilis and of persecution.	Abdomen protuberant.	Wassermann negative.
Incoherent speech.	Large hips.	Blood pressure $115\frac{1}{5}$.
Partially disoriented.	Smooth pink skin.	Blood uric acid 1 mg.
Believes he had committed great wrong.	Dermatographia.	Blood urea 22 mg.
Emotional instability.	Hairless with exception of genital hair.	Blood creatinine 2.50 mg.
Lacrimosity.	Genital hair scanty and of feminine distribution.	<i>Thyroid test:</i> Hypothyroid type of curve.
Refused to work.	General obesity.	<i>Sugar tolerance test:</i> Somewhat atypical but pointed toward hypoglandular condition.
Introspective.	Facial expression of young child, small fat rounded cheeks and pale blue eyes.	
Gormandizer.	Pulse 80.	
Delusions of sexual perversions performed on himself.	Pupils slightly dilated, reactions sluggish.	
Combative because of homosexual delusions.	Enlarged adenoids and tonsils.	
Thought reading complex.	Reflexes sluggish.	
Childish reactions to situations.	Subnormal temperature.	
Stubborn and unobliging.		

This patient was placed on small doses of mixture of pituitary and thyroid glands which began to produce results within a very few days. He changed from an inactive, complaining, day dreaming individual to an active hard working, pleasant, and interested boy. His physical makeup also changed, in that he lost weight, muscles were more firm and not so easily fatigued, and his face became less flabby, taking on a more intelligent expression. Patient discharged as cured.

(To be continued)

A CASE OF EPIDEMIC (LETHARGIC) ENCEPHALITIS
WITH A TREMOR TYPICAL OF MULTIPLE
SCLEROSIS

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It is well known that epidemic (lethargic) encephalitis exhibits a great variety of clinical types or syndromes. Tilney and Howe (1) recognize fourteen types, while Wechsler (2) points out that twenty-five types figure in the descriptions and reports of this disease. Of these numerous types the most remarkable is the one characterized by the prevalence of motor restlessness, in the form of muscular twitchings and contractions (myoclonic type), choreiform movements or paralysis agitans. According to Wechsler's data, the myoclonic variety of epidemic encephalitis is the most frequent of all the atypical forms of this disease. In the case to be recorded motor restlessness of a peculiar type has been the sole manifestation of its initial stage.

Report of Case.—A 54-year-old married man, furrier by occupation, with a good previous history, took sick on January 8, 1921, with a rhinitis and a severe "sticking" pain in the head. The pain was, according to the patient, especially severe in the hairy portion of the frontal region of the head. Subsequently it spread to the occiput, right upper arm and down to the elbow. The pain in the head was continuous, the hair and the skin of the head having been sensitive to the slightest touch, while the pain in the shoulder and upper extremity was paroxysmal. In spite of the pain, which often deprived the patient of sleep, he kept at his work, did not feel weak, had no fever, enjoyed a good appetite and sometimes was quite comfortable.

Two weeks after the onset of the pain a tremor developed in the

right arm and hand. It was much more annoying than the pain and forced the patient to seek medical advice. Examination revealed no changes in the patient's mental or nervous condition. Thus the cranial nerves, pupils, sensibility, muscle power, the genito-urinary organs, temperature, pulse and mentality, all were normal. The sole abnormality was a pronounced tremor of the entire upper extremity and especially marked on movement. It bore all the features of a multiple sclerosis tremor, though the power in the muscles of the affected extremity was very well preserved. He was unable to button his clothes, use his hand in writing, eating or drinking, and had to be fed by his wife. At rest, the tremor was very mild and often entirely absent. The left hand did not exhibit any tremor, but it could not be used by the patient for skilled movements.

Three days after the onset of the tremor, and about two weeks after that of the pain, he developed a diplopia, began to sleep and became irrational. He had numerous hallucinations, sang in his sleep and talked incoherently.

The examination at this stage of the disease found the patient lying in bed, with the eyes half open, head bent over the chest, thighs and legs flexed and the body curved. Rigidity of the neck, as well as tremor, palsies and sweating, were absent. The half-closed eyes could be opened with difficulty. The pupils were regular but unequal, the left reacting to light sluggishly, while the right did not react at all. The eye-ball movements were normal; the face was symmetrical, but showed a masklike, blank expression; the tongue, pharynx, larynx, as well as the pulse, temperature, sensibility, respiration, deglutition and genito-urinary apparatus, were normal. The tendon and cutaneous reflexes were also normal, except the left abdominal, which was diminished. Babinski, Gordon and Oppenheim phenomena were absent. The urine examinations proved negative; the spinal fluid had not been examined.

The patient was very stuporous, lethargic, answered simplest questions with great difficulty, falling asleep without finishing his answers, and poorly cooperated in the examination. Thus the principal findings were: lethargy, pupillary abnormalities, expressionless face and extreme weakness. This condition lasted for seven weeks and ended in recovery, which, however, was not complete, as the examination, three weeks after his recovery, showed a slight facial paresis on the right side, a masklike expression of the face and there was still some pain in the right arm.

Discussion.—The onset of the disease was marked with *pain*,

which was followed by a *tremor* and *lethargy*. The initial stage can be termed neuralgic or neuritic, a term also applied to the entire symptom-complex of some forms of lethargic encephalitis, while the second stage, with the motor restlessness as the main symptom, strongly resembled a tremor of multiple sclerosis. This tremor was entirely different from the twitchings and tremors so often seen in epidemic encephalitis (myoclonia, choreiform movements, fascicular and fibrillary contractions). The tremor was very mild; in fact, it was even not noticed by the patient and his relatives when the affected extremity was at rest, but would become violent upon the slightest so-called intentional movements. It was so annoying and distressing that it rendered the patient almost helpless. The tremor was the sole manifestation of the disease at the time of the first examination, which revealed no other abnormal findings that might have been suggestive of some organic brain lesion. Only with the onset of the third stage of the disease—lethargy and pupillary disorders—it became quite apparent that the pain, the tremor and the lethargy were but stages of the same disease—epidemic encephalitis. Of these three prominent symptoms, the last two disappeared entirely, only the pain remaining, coming and going, but not interfering with the patient's work.

As to the pathogenesis of the foregoing symptoms, and the proper classification of this type of epidemic encephalitis, we might suggest that in the initial stage the pain was probably due to a dorsal root irritation by inflamed meninges; that is to say, they were meningeal in origin. The same explanation might be given for the tremor, which could be considered as a ventral root irritation by the inflamed meninges. In favor of such a view speaks the fact that the pain was stabbing in character, shooting, radiating from the occiput down to the elbow, and occurring in paroxysms. In short, they resembled root pains, such as seen in meningitis, tabes, extra-spinal tumors and other conditions in which the posterior (dorsal) roots are irritated. In this stage the encephalitis was of the neuralgic or neuritic, or still better, of the meningo-radicular type.

The presence of the lethargy and of the involvement of the intrinsic ocular muscles generally considered typical for the so-called mid-brain or polioencephalitic type, followed the meningo-radicular form. Had the patient exhibited myoclonic movements instead of a peculiar tremor, he would have had, in addition to the foregoing, two types, also the myoclonic type. It follows that several types may be combined in the same clinical picture of epidemic enceph-

alitis. In other words, the latter may show as many types as symptoms, of which one may predominate and stamp the disease as a distinct type. However, this can not affect the clinical picture as a whole, for lethargic encephalitis is a systemic infectious disease with the preferable localization of the morbid condition in the mid-brain, regardless of the type of the disease.

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COOK COUNTY HOSPITAL.

Society Proceedings

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MONTHLY MEETING, OCTOBER 20, 1921

JAMES B. AYER, M.D., President, in the Chair

THE SOMATIC ORIGIN OF CERTAIN SEXUAL DELUSIONS

DR. J. W. COURTNEY said that in the entire domain of mental disorders there is probably no delusional state more curious than that in which the belief is entertained by individuals of the female gender, that sexual intercourse is had with them, during their sleep, by beings either human or supernatural. According to the tenets of the oneirologic school of psychology, a delusion of this character is the product of an uneven conflict waged in the unconscious mind between erotic desires and moral inhibitions. The concept of it which is about to be exploited is based on fundamental physiologic principles—hence, excludes the unscientific notion of an unconscious mind, since, obviously, mind cannot exist without some degree of consciousness.

Dr. Courtney maintains that when those sensations whose summation is the sexual orgasm, are traced to their origins, it will be found that they are manifold and of several orders; tactual, muscular, visual, auditory, olfactory, thermal and so forth. As a result of the repetition of sexual congress at intervals over a certain period of time, the above sensational elements become so strongly integrated and correlated that their resultant ideational and emotional complexes may easily be reproduced by stimuli, however indirectly applied, which evoke but a single one of the sensational elements enumerated—and that in so minor a degree of intensity that, in its course along centripetal paths, it fails to reach the higher levels of consciousness.

With these physiologic facts at command, the genesis of the delusion under consideration is manifest. In the sleep state tactual and thermal sensations initiated in the external genitalia by bed clothing, thermal sensations in the same parts aroused by the pelvic congestion or vasomotor origin, which precedes menstruation, or the sensori-motor impulses sent direct to the clitoris by a full bladder through the medium of the pudic nerve, easily suffice to set in action the remainder of the group of integrated and correlated sensations, and these, according to the strength of their integration and correlation, determine the vividness of the ideational feeling of sexual congress to which, by sublimation in centers higher up, but still below the highest levels of consciousness, they give rise.

The concordance between the principles thus outlined and observed clinical phenomena Dr. Courtney believes is perfect. Where the deluded individual's experience with sexual congress is extensive, the dream coitus has an ideational content which embraces highly complex combinations—postural and dynamic—in the voluntary and involuntary muscular systems alike, intense tactual and thermal sensations and last, but not least, visual impressions of an order sufficiently vivid to give rise to the actual sight of a male figure, yet falling short, as a rule, of the degree of vividness necessary to identify this figure with that of a known person.

Where the deluded individual is *virgo intacta* and without personal sexual experience of any order or degree—hence, where her knowledge of the male configuration has been derived through effigies, and of the procreative act by reading and hearsay, the sensational elements underlying her delusion are so feebly integrated and correlated that the story she tells of her defloration during sleep lacks utterly in circumstantiality and congruity.

In both instances, however, the ideas initiated by the sensational stimulus follow well-established physiologic laws as regards durability. Their tendency to endure is, to be sure, enhanced by the general erethism of the organism, which coexists. Be this as it may, they do in fact persist with such tenacity that the reasoning powers of the individual's fully awakened consciousness are impotent to repress them. By their very persistence they soon dominate the mind as completely as if they were established facts—hence, readily excite its inferential activities.

In the case of the female with actual experience of coitus these activities seldom go further than to lead her to the conclusion that the partner of her nocturnal sexual activities is a human being, whereas, in the case of *virgo intacta* without any personal knowledge of the procreative act, the conclusion arrived at is infinitely more complex. For the reasons already set forth, she cannot identify her ravisher even as a member of the human species—hence, through the religious exaltation of which she is generally also the victim, her distorted reasoning runs upon supernatural agency, and she finally convinces herself not only that her dream defloration was brought about by such agency, but that its accomplishment is of vast importance to the celestial hierarchy.

Discussion.—DR. STANLEY COBB maintained if it were true that such dreams had a physiological origin rather than psychogenic, all women at certain times would have such dreams. He believed that there must be a psychogenic factor and an unconscious cause aside from the physiological. He did not believe that the physiological and psychogenic theories were mutually exclusive.

DR. J. W. COURTNEY replied that he did not consider the two theories mutually exclusive. He simply emphasized the physiological as the dependable one, the one dictated by common sense. It seemed to him highly illogical to exploit theories of pathogenesis in mental disorders, which in nowise conform to the laws underlying pathogenesis in general.

A PRELIMINARY REPORT ON THE TREATMENT OF PARALYSIS AGITANS

HUGO MELLA read this paper. Claude, Sicard Lhermitte, Quesnel and Rodriguez have reported excellent results with the use of sodium cacodylate in cases of spastic paraplegia and Parkinson's disease.

STANLEY COBB, at the Massachusetts General Hospital, gave sodium cacodylate in .5-gram doses (intramuscular) daily for ten days with no relief in two cases, one of paralysis agitans and one of amyotrophic lateral sclerosis—another case of paralysis agitans showing marked tremor and moderate rigidity with pain had relief from the rigidity and pain and the tremor diminished. At the Massachusetts General Hospital Dr. Mella gave it in one case of central nervous system syphilis with Parkinson's syndrome and no amelioration of the tremors or rigidity was noted. One case of very rigid post-encephalitic Parkinson's disease, after ten doses of one half gram and four of 1 gram showed only slight relief from rigidity. Another mild case of Parkinson's, after ten one-half gram doses walked better, wrote better and could move her arms more freely. The results in ambulatory cases not being satisfactory, four very advanced cases at the Long Island Hospital, Boston, were then chosen.

Case 1.—Rigidity commenced eighteen years ago, bed-ridden for last year, tremors of arms and legs, arms and legs markedly flexed and rigid, cannot feed self or raise arms. After fourth dose patient could raise right arm and feed self.

Case 2.—Rigidity and tremors commenced twelve years ago. Very rigid, cannot raise arms to level of shoulders. In April, 1921, ten doses of one half gram each were given with no relief, then six doses of one gram each were given after which the patient could raise his arms above his head, move more easily and showed only slight rigidity but associated movements in rising from chair and walking did not return. Has had no injections since then and is about the same as when treatment was stopped.

Case 3.—Practically helpless for last four years, had to be lifted from bed to chair and could not feed herself; marked tremors and rigidity. After fifteen one-half gram doses in April, 1921, patient could walk across ward unaided, raise arms above head and feed herself. One course of ten doses has been given since then and patient is still up and feeds herself.

Case 4.—Rigidity and tremors commenced four years ago. Has been confined to bed for eighteen months practically helpless. In April, 1921, after eleven one-half gram doses of sodium cacodylate, patient was up, walking about ward and able to feed herself, showing a slight tremor and only a moderate amount of rigidity.

A PRELIMINARY REPORT ON THE TREATMENT OF MYASTHENIA GRAVIS

HUGO MELLA said that in the fall of 1920 a young lady was seen in the out-patient department of the Massachusetts General

Hospital, who showed the signs and gave the typical electrical reactions of a well-developed and advanced case of myasthenia gravis. Just previous to this a patient under Dr. Mella's care had died of this disease and autopsy showed a large, malignant, thymus gland. X-ray of the case reported showed a rather large shadow in the thymus region. X-ray treatments were commenced by Dr. Holmes under great precaution, in sub-erythema doses (the patient reacting severely). After seven such doses the patient was entirely relieved. She has been free of all signs of myasthenia gravis since April, 1921. Her electrical reactions are now normal. A complete report of this case is to be given when at least a year has elapsed after the disappearance of all signs of the disease.

Discussion.—DR. STANLEY COBB said that their interest in these problems had been aroused by the work of the French authors mentioned. While the experience at the Massachusetts General Hospital had been somewhat unsatisfactory it might be said that these cases that had been given arsenic were all ambulatory cases. The most marked improvement had been found in the cases at the Long Island Hospital where there was often extreme rigidity of long standing. It seemed certain that arsenic effected the rigidity of paralysis agitans in some way. Investigation is being carried on in the Department of Neuropathology at the Harvard Medical School on locating anatomically the centers for rigidity and tremor. So far, the results correspond with the recent work of Wilson and Ramsay Hunt, *i.e.*, in all probability the pathology lies in the basal ganglia. The work on animals is not satisfactory because, since they are quadrupeds, their locomotor coordination differs from that in human beings. Dr. Mella's work is interesting and valuable inasmuch as up to the present time there has been no therapy to offer people who suffer from paralysis agitans.

DR. A. S. MERRILL remarked that the diagnosis of enlarged thymus is not an easy one to make. Occasionally a shadow can be seen which can be attributed to nothing else, but the thymus, as a general thing, is very transparent and casts but a slight shadow on the plate. However, when the thymus is suspected to be present clinically or from X-ray examination, it is known to be one of the most susceptible organs in the body to the effects of irradiation. Assuming the case owes its trouble to the hyper-activity of this gland it would be quite logical to presume that irradiation of this gland would have some effect on the patient's condition.

DR. WALTER B. SWIFT, in this connection, mentioned a series of exercises which he had brought out a year or two ago for the treatment of paralysis agitans. At that time he could not estimate just the value of these exercises but from an additional series of fifteen or twenty cases he judged the improvement to be from 10 per cent. to 60 per cent. of the elimination of the tremor. These exercises build up the central slowing-up mechanism, whatever that is or wherever it is located. When a man can be made to hold his newspaper still so that he can read it, which he could not do before, and when he doesn't take an hour or two to go to sleep it would

seem that the exercises were of some help. They are not a cure and some cases do not respond. The localization of the function that has been built up is an interesting question. Of course the cortex areas that are put into function during the exercises are the ascending parietal convolution and the ascending frontal convolution. But beyond that there must be a constantly conscious control. It would seem that the slowing-up area that has developed must be in the sensory and in the conscious area. That would rule it out of the lower levels that have been mentioned. The trouble seems due physiologically to some lack of conscious sensorial control.

DR. J. W. COURTNEY, speaking of the pathology of paralysis agitans, mentioned two necropsies which he had the opportunity to make a number of years ago at the Home for Incurables in cases of this sort. The most striking thing he observed was the apparent shrinkage of the cord in toto. In both cases it appeared not to be over half its normal size. In one of these cases Dr. Thomas made serial sections through the entire cord and about all that was found were universal perivascular changes of no marked extent. A study of the literature of the pathology of paralysis agitans made by Dr. Courtney at the time revealed an extraordinary lack of uniformity in the findings of different observers.

DR. SOLOMON FULLER asked if there was any reason for selecting the deep intramuscular method of injection.

DR. MELLA, in closing, remarked that the pathology of paralysis agitans was a broad subject to discuss and that there is a great difference of opinion as to whether the lesion is located in the globus pallidus which theory Ramsay Hunt has brought forth or in the locus niger as worked out by Trétiakoff. There are several structures sending impulses to the red nucleus of which even the physiology is not clearly understood much less the pathology. In answer to Dr. Fuller's question he said that the intravenous method could be used but the intramuscular injection had been found to be a simpler method. Furthermore, the arsenic preparations are excreted very rapidly when given intravenously but much more slowly when given intramuscularly. It is also less painful than if given subcutaneously.

SYRINGOMYELIA AND X-RAYS

GEORGE CLYMER read this paper. In 1907 a series of cases of syringomyelia, treated by X-ray, were reported by Beaugard Lhermitte. Their report was so encouraging that further observation seemed desirable. The present case, a young woman, twenty-four, single, has been under observation for a little over six years. The duration of symptoms when first seen was about eighteen months. The story was of weakness and atrophy of right hand, disturbance of sensation, chiefly heat and cold, and pains running from the spine into the right arm. Examination showed an area of diminished sensation involving inner aspect of right arm and hand, extending to back and chest, and also an area in right thigh. X-ray of spine showed bifurcation of spines of third and fourth cervical vertebræ.

suggesting congenital developmental defect. Under X-ray treatment the patient's symptoms have grown less, pains have stopped, and she had held a secretarial position for three years. Recent careful examination shows diminution in area of sensory disturbance. No evidence of the progress of the disease.

Discussion.—DR. A. S. MERRILL stated that the effect of the X-ray on cell tissue depends upon its approach to the embryonic form, that is, cells approaching the embryonic type with active cell division are more susceptible to the influence of the X-ray. Acting on this theory that this condition may be due to a cell proliferation of a neoplastic type of cell approaching the embryonic type it is reasonable to assume that they may be affected by the X-ray provided they can be reached at their depth by a proper dose for that type of cell. In this case of which Dr. Clymer speaks the attempt was made to act on that supposition. The case received treatment over the whole cervical and practically the whole dorsal cord. The irradiation was pushed to the limit of skin endurance. The French authors, as before mentioned, are very optimistic in their statements. However, the longest case which they mentioned as following was only eleven months. Dr. Clymer's case had been under observation for over six years. Improvement began promptly after the first few applications of the X-ray. The first disturbances which showed improvement were the motor. This follows the usual order of improvement, first motor then sensory. As might be reasonably assumed, there is a symptomatic residue which is probably due to the fact that certain nerve tracts have been completely destroyed but muscles showing evidence of beginning degeneration regain their power and the sensory disturbances are relieved. Several cases of fair duration have showed encouraging results. Dr. Clymer's case was irradiated very thoroughly over sixteen or seventeen areas over the spinal cord from the upper cervical to the lower dorsal on either side. At that time the method of cross firing was used to pick out the objective point from different directions and get a multiple dose at the spot where the growth focused and also to avoid injuring the skin on the outside. The French authors state with perfect reason that the cord should be treated over the whole extent indicated by the most careful neurological examination and by the superficial findings and, it may be added, then some. It is not wise to stop at the precise point where the superficial signs appear to indicate trouble. Another case which has been under treatment has given less encouragement. So far as can be seen there is very little change in the patient's condition. She has received a number of irradiations including only the cervical cord. It would be better if she could have further irradiation over more of the cord.

DR. J. B. AYER mentioned the case of a woman of 27 who came to the Massachusetts General Hospital in 1917 and was given X-ray treatment beginning in 1919. The picture was very similar to that of Dr. Clymer's case. She had a very weak, atrophic left hand and much difficulty in distinguishing heat and cold. Four months

previous to her coming she had developed distinct weakness of the right hand. The history, therefore, gave evidence of a progressive case. Blood and spinal fluid Wassermann negative. She became worse in 1919 and developed paralysis of the left vocal cord. In 1919, with the disease progressive, she began to have X-ray treatments. From December, 1919, to June, 1921, she had seventeen exposures by Dr. Merrill. Neither clinically nor on examination did she show progression in that time. On the other hand she has felt much better, has not developed further weakness or dissociation of sensation or spasticity in either leg. There were no changes showing degeneration below the area affected so that it seems possible that this case had been arrested although not much improved.

DR. CLYMER (in closing). Inasmuch as there has been demonstrated these two cases in addition to the cases reported from France in which there has been no progress of the disease the X-ray is, at least, a form of treatment worth considering.

RESULTS OF A BRIEF NEUROPSYCHIATRIC EXAMINATION OF 1141 STUDENTS

DR. STANLEY COBB read this paper. Dr. Roger I. Lee began in 1914 to undertake the physical examination of students entering Harvard. The examination was necessarily brief; later he called in certain specialists to take up various problems that presented themselves. Dr. Lloyd T. Brown made a study of the orthopedic aspect. Dr. Lee asked Dr. Cobb to study "nervous instability" because of the common occurrence of neurotic symptoms; he reported the results and the method of working on the problem of nervous instability as follows:

The cases were sorted out, first, by finding the number of men who could give a past history of any neurotic condition; second, those who presented physical signs indicating a tendency to nervous instability; third, those who showed evidence of any endocrinopathy; fourth, the following up through the four years of men on whom primary observations had been made to study their reaction to their problems. The correlation of these facts showed first the incidence of nervous instability. Eighty-eight had a definite past history of some form of nervous instability such as night terrors, sleep walking, stammering. This latter symptom comprised 23 per cent. of the neurotic symptoms. A comparison was made of the physical findings of those men who had a positive history and those who had no such history. The rapidity of the heart was studied, vaso-motor symptoms, knee jerk, posture, albuminuria, blood pressure and the vegetative nervous system. Tables were shown giving these comparisons. Of the total number of 1,141 students only 22 were found to show pathology of the glands of internal secretion and these were not severe cases.

The work indicated the following conclusions:

1. History is the best guide to nervous instability—family history, past history and present complaints.

2. In a short fifteen-minute examination it is impossible to get a history with accuracy and freshmen have few well-defined problems.

3. Vasomotor instability was found somewhat more frequently in the men with neurotic histories.

4. Tachycardia, blood pressure variation and dermatographia are often found associated with each other and with exaggerated knee jerks. Men with albuminuria are likely to show all these symptoms.

5. Endocrinopathy was rare, but the small number discovered showed more symptoms referable to the vegetative nervous system and less neurotic history and acne.

6. In men with bad mechanical use of the body tachycardia, sinus arrhythmia, high blood pressure and variable systolic pressure were more common.

7. The men with good bodily mechanics passed better psychological examinations than those with poor posture.

Discussion.—DR. LLOYD T. BROWN stated that the study represented in this paper was made on a group of educated young adults. The examination was carried out at the end of their vacation when they were in the pink of physical condition. In the literature it was possible to find no standard by which to judge of what constituted good and bad bodily mechanics. Therefore, tracings were made of each man, and according to the look of these tracings four groups were made. About 740 men were examined.

In judging the posture, or bodily mechanics, four points were taken up; the position of the head, the position and shape of the chest and abdomen, and their relation to each other, and lastly, the antero-posterior curves of the back. It was found that 7.5 per cent. fell in the A, or good bodily mechanics group, 12.5 per cent. in the B, or fairly good group, 55 per cent. in the bad mechanics group, and 25 per cent. in the very bad bodily mechanics group. These men were all asked certain questions about their health; among these was the occurrence of backache. No man in the A or B groups had backaches; about 7 per cent. of the C group and 9 or 10 per cent. of the D group had had backaches. The operation for appendicitis had been performed one and a half times as often in the C and D groups as in the A and B. Albuminuria was found in a considerable number of men. All cases in which it was found were followed up with great care, with the result that there were seven cases of persistent or orthostatic albuminuria. Of these seven cases, one man was in the C group and the other six were in the D group.

In judging the postures or the mechanics of the body, it is necessary to appreciate that there are very different types of individuals and that there cannot be one standard for the human race as a whole. Some people are naturally thin and have long, thin bodies and will never grow fat. Others are of the short, stocky type and tend to grow fat in spite of whatever they may do. Either of these two classes or the very large class that is half way between, mechanically may use their bodies very badly, so that it is neces-

sary to judge all people from a standard which can apply to one particular individual. (Pictures were shown to explain this point.)

The bad bodily mechanics that are so commonly seen are very common in children, associated with fatigue. Pictures of a case in this condition were shown. The case was of a child four and one half years old. She had always been a difficult child to feed and was never really well, having many attacks of indigestion and constipation. She was brought to an orthopedic surgeon because of acute attacks of extreme pain in one hip. Examination showed that there was no organic disease of the hip, but that the child used her body in an extremely faulty mechanical way. For treatment, the child was shown how to use her body properly and given a brace to relieve the fatigue. She recovered entirely from the hip trouble and the constipation and indigestion were improved. After two years she came back again with the original symptoms. The postural work had been entirely given up. It was again begun under more strict supervision and at the present time the child is sixteen years old and is extremely well.

The point that such a case brings out is that it is necessary to recognize the faulty mechanical element as well as the fatigue element, and that the remedy for these conditions is education, not only of the child, but of the parents: that this education should be started very young and that it should be a part of the curricula of all schools, so that when adult life is reached the necessity for the individual to compensate for his poor bodily mechanics will not add one more element of fatigue.

DR. COBB, in closing, emphasized the fact that the problem of nervous instability fell not only in the field of psychiatry but in all general medicine as well.

Current Literature

I. VEGETATIVE NEUROLOGY

I. SYMPATHETIC NERVOUS SYSTEM

Guillaume, A. C. THE VAGOSYMPATHETIC REFLEXES. [Presse Médicale, August 21, 1920.]

The author calls attention to the great importance of the vegetative reflexes. They are profoundly altered in numerous pathologic conditions. The pituitary seems to be a special target for vegetative nervous reflex anomalies. With the aid of the oculo-cardiac and similar reflexes deeper insight may be obtained of many psychoses, neuroses, etc.

Bolten, H. SO-CALLED VAGUS NEUROSES. [Nederl. Tijdschr. v. Geneeskunde, June 12, 1920.]

This author seeks to find an exaggerated sympathicotonia in many cardiac neuroses as a better explanation than a vagotonia. Congenital hypotonia of the sympathetic is the real cause, he believes. The congenital neuropathic constitution and the neuroses are due to a sub-standard vegetative nervous system, and this inferiority is most pronounced in the sympathetic portion of this system. With these neuroses (asthma, gout, urticaria, migraine, epilepsy, mucous colitis, intermittent hydrops of joints) there is a constitutional disturbance of the fermentative purin metabolism from sympathetic hypotonia.

Silvestri, T. ENDOCRINE FACTORS IN GASTRIC ULCER. [Policlinic, June 28, 1920.]

The author shows that pregnancy is an important factor to be valued in interpreting the results of experimental research on the relationships of adrenal action and gastric ulcer formation: Vagotonic let down, from operation or exhaustion favor ulcer formation.

Moro, E. ECZEMA AND THE VEGETATIVE NERVOUS SYSTEM. [Münch. med. Woch., May 28, 1920.]

Eczema in infants, according to Moro, should not be treated vigorously during the early months of the year. Thoroughgoing external treatment should be reserved for the summer or fall months, since the vegetative nervous system is very hyperexcitable in the early months of the year. He cites fifteen fatal cases in support of his view. Thirteen of the deaths occurred during the three-month period from February 1 to March 31, while only two occurred during the other nine months of the year.

Weber, F. P. DIAGNOSIS OF SUPRARENAL TUMORS. [Practitioner, September, 1920.]

Suprarenal tumors, especially when of the medullary constituents, cause blood pressure changes. In one case of a child here reported, the brachial systolic blood pressure was 108 mm. Hg. Another, a woman of 40, who had a tumor on the right side of the abdomen about the size of a kidney, had a brachial systolic blood pressure of from 205 to 220 mm. of mercury.

Pearce, N. O. AMYOTONIA CONGENITA. [Am. Jl. Dis. Children, November, 1920.]

Five cases are here reported upon. One is of special interest, since its syndrome was classical and furthermore was made the object of extensive metabolic studies here reported in detail. The second and third cases and the fourth and fifth cases are believed to be the first instances of twins suffering from the disease to be reported.

Ziegler, M. R., and Pearce, N. O. METABOLIC STUDY OF AMYOTONIA CONGENITA. [Jl. Biol. Chem., XLII, 581, 1920.]

A metabolic study of one case of amyotonia congenita showing the classical symptomatology described by Reuben and Faber was carried on for a month. Twenty-four hour specimens of urine, food and feces were analyzed daily during the experimental period. Blood analysis and a histologic examination of the muscle was made.

The most significant facts observed were: Lowered creatinine excretion, in addition to the excretion of creatine on a low protein diet. Normal uric acid excretion; therefore no nucleoprotein broken down. An increased rest nitrogen, accompanied by an increased neutral sulfur. Normal phosphorus excretion; therefore no bone disintegration. Lowered chloride excretion. [Author's abstract.]

Claude, Henri, and Porak, René. A CLINICAL, PHYSIO-PATHOLOGICAL, AND ANATOMICAL STUDY OF A CASE OF PARALYTIC MYASTHENIA. [L'Encephale, 1920, July 10, Vol. 15, p. 425.]

Paralytic myasthenia or the syndrome of Erb-Goldflam is a disease of which the pathogenesis is still obscure, and for this reason the authors report a case which fell under their observation, a man 53 years of age who within several months after an attack of grippe was affected with myasthenia which yielded to treatment, but became worse again after a second attack of grippe and finally terminated in death. During the last days he breathed with great difficulty, his palate and cheeks were flaccid, the lower jaw hung loosely, the mouth open, the eyelids were almost closed and he could neither chew nor swallow nourishment. Though the motor disturbances in their origin and clinical features presented little difference from the classical picture of myasthenia, they were interesting from the fact that under polyopotherapeutic treatment

they receded for a period of nearly four months. Hypophysis extract and various suprarenal extracts were used. The hypophysis treatment had to be abandoned, however, because of the fall of arterial pressure after injections. An interesting feature was the augmentation of the excretion of creatinin in the urine in the terminal period of the disease. Blanchetière has also called attention to important modifications of metabolism in severe myasthenia. The anatomico-pathological examination of the case revealed a mediastinal tumor which could be considered to have been formed at the expense of the thymus. Tumors of the thymus have been described by other writers in connection with this disease (Hansemann, Oppenheim), or at least, hypertrophy of the thymus. In the author's case the suprarenals were well developed, and it was only the parathyroids and hypophysis which presented important changes in the hypophysis increase in volume and pigmentary alterations; in the parathyroids enlargement and cellular modifications indicative of hyperactivity. The muscular alterations were slight, attenuation, longitudinal division and tendency of some fibers to atrophy. No lesions of the nerve fibers either in the main trunks or in the branches were noted. In summing up the authors emphasize the importance of the tumor of the thymus which had completely modified the structure of that organ, stating that in the present stage of our knowledge it is impossible to say just what effect such a modification would have on the functions and particularly on the secretions of an endocrine gland, but it is possible to say that the activity of this gland and its correlation with the thyroid, so well established by Dustin and Zuntz, must have had some profound effect on the organism. The myasthenia made its appearance after an infectious disease (grippe) and it is possible that the intoxication set the functional muscular disturbances in activity, to which the individual was predisposed because of the neoplasm of the thymus. However this may be, during the entire evolution of the myasthenic syndrome (which seemed to have been successfully combated for several months, by glandular treatment) the activity of the various glands appeared normal or even above normal (acceleration of pulse and arterial pressure). Notwithstanding a second infection (staphylococcus) which obliged the patient to modify the treatment, good results were again obtained during several months from glandular therapy. At the end of this period the organic resistance suddenly gave way and in a few days the myasthenia became so grave that death ensued. The histological autopsy showed the glands by their size and structure indicating hyperfunctioning but nothing could be certainly determined concerning their psychological activity and it is quite possible that after having long conquered an auto-intoxication by a compensatory hypertrophy they at last broke down as consequence of a sort of functional exhaustion. To certainly establish this interpretation further application of biological methods and pharmacodynamic tests would be necessary.

Izar. TREATMENT OF SCLERODERMA. [Rif. Med., May 22, 1920. B. M. J.]

The author publishes, with a portrait, a case of scleroderma in a child of 7, cured by hypophysis treatment. The pathogenesis of scleroderma is uncertain, but most authorities associate it with some fault in the endocrine system. In the author's case some evidence of impaired function of the hypophysis was found in the adiposity of the mother and sister. The sella turcica of the patient was somewhat enlarged (19 mm. + 7 mm.), there was a certain degree of adiposity, marked scleroderma and pigmentation, cold sweating of the palms and soles, and "solid edema" impairing the movement of the limbs, especially in flexion. Injections of hypophysin and pituitrin ($\frac{1}{2}$ c.cm.) were given alternately every day for fifteen days and then on alternate days. After the sixth injection a decided improvement was noted, beginning with the skin of the face and abdomen and then spreading to other parts; the skin became more elastic, the itching disappeared, and the sweating of the hands and feet diminished. The injections were discontinued after thirty-two had been given, but a half-tabloid of hypophysin was given on alternate days. Treatment was begun in May, 1919; when the child was seen again in January, 1920, every sign of scleroderma had disappeared. Except for tiny scattered areas of atrophy, the skin was quite normal.

II. SENSORI-MOTOR NEUROLOGY

5. BRAIN; MENINGES.

Fabris, S. STREPTOTHRIX MENINGITIS. [Pediatria, June, 1920.]

Following an attack of pneumonia his nine months' old child, also a victim of hereditary syphilis, developed a well marked case of streptothrix meningitis. The organism was recovered from the C. S. F. Similar cases from literature are cited.

Geymüller, E. ACTINOMYCOSIS OF NECK AND BRAIN. [Deut. Ztschr. f. Chir., September, 1919.]

This is the report of a case in which the diagnosis of a tuberculous process in the atlas was incorrectly made. Puncture of a swelling in the neck, disclosing actinomyces. The lesions being multiple, surgical measures are of no service.

Bolaffi, A. UNUSUAL FORMS OF MENINGOCOCCAL INFECTION. [Il Polistico, Sez. Med., February, 1920.]

Unusual forms of meningococemia are here reported. The first patient was a girl, 5, with symptoms of meningitis. The cerebrospinal fluid was opalescent and showed almost pure lymphocytosis and a large quantity of meningococci. Antimeningococcal serum caused the organism to diminish but the disease continued and death took place on

the sixty-seventh day. No evidence of tuberculosis was found at the autopsy or on inoculation of guinea pigs with the cerebrospinal fluid. The second case, which occurred in a young soldier, was an example of meningococcal septicemia with localization of the infection in the skin and lungs, but without meningitis. The author also records several cases of meningococcal meningitis in which the onset was insidious or accompanied by neuralgic symptoms or gastrointestinal disturbance.

de Angelis, F. BLOCKED MENINGITIS IN INFANT. RECOVERY. [Pediatrics, June 15, 1920.]

This rare syndrome, occasioned by a blocking off of the ventricular-spinal cord connections, is discussed in this study. This 7 months' babe was first seen fifteen days after the first symptoms. There was no fever, but the nervous symptoms were severe. Intraspinal injection of antiserum was given for four days when no fluid could be obtained at lumbar puncture. Antiserum was then given by intraventricular injection until 140 c.c. had been injected. Urticaria developed.

Glover, J. A. MENINGOCOCCUS CARRIER ROUTE. [Br. Med. J., September 18, 1920.]

Summarizing the points of prophylaxis against cerebrospinal fever, the prevention of overcrowding is emphasized by Glover as being of paramount importance. Ventilation and distance between beds are of much greater importance than mere floor or cubic space. Wall space is essential. The early isolation of cases of catarrhal disorder is of great importance in preventing the increase of the carrier rate. From one point of view it is almost of more importance to isolate a coryza patient who has not a catarrh. The former can spray the carrier at 4 or 5 feet, and if the carrier succumb to the coryza, he in his turn spray the meningococcus with his catarrhal sneeze to a like distance. In exceptional circumstances steam spray treatment may be of great assistance. The peace standard of the British army of three feet between beds, sixty square feet of floor space and 600 cubic feet is adequate, and will probably render other prophylactic measures unnecessary. [J. A. M. A.]

van Riemodijk. REMARKABLE CASE OF CEREBROSPINAL MENINGITIS. [Nederl. Tijdschr. v. Geneesk., April 24, 1920. Br. M. J.]

This report is of interest in the finding of a rare organism, the micrococcus tetragenus albus, as the cause of the meningitis.

Foti, P. SEROTHERAPY IN MENINGOCOCCUS MENINGITIS. [Pediatrics, April, 1920. J. A. M. A.]

Foti gives the details of twenty-two cases in children with recovery of 61 per cent. In eighteen cases given systematic serotherapy, the mortality was 60 per cent, in the children under 2, and 15 per cent. in the older children, none dying of the six over 6 years old. The influence of the antiserum was prompt and decisive, even in two cases in which the

serotherapy was not begun until the fortieth and forty-seventh days. Usually four or five intraspinal injections of 20 c.c. each were given. The mortality was in inverse ratio to the age, but it was not so high in infants as in the statistics from most other clinics. He ascribes this to his supplementary use of a vaccine by the vein in cases refractory to the antiserum. Hot baths and hexamethylenamin were given also in some cases.

Luquero, C. G. AN EPIDEMIC OF CEREBROSPINAL MENINGITIS. [Plus-
Ultra, February, 1920.]

An epidemic of cerebrospinal meningitis broke out in the early months of 1918 in the town of Santoña (Spain). It was characterized by scanty distribution, focusing on certain spots in the population and occurring interruptedly. After three months of these cases we opened an observation laboratory and a small disinfection center in which every facility was granted us by the local and provincial sanitary authorities. Our main interest was centered on the carriers of the germs, after having determined the meningococcic nature of the affection by bacteriological investigation, so we inaugurated a campaign to disinfect the pharynges of the population (6,000 inhabitants), for which purpose we equipped various sanitary brigades who established themselves in the densest centers of population and assemblage (schools, etc.). For twenty-five consecutive days this campaign was pursued with completely satisfactory results, for the epidemic ended.

Altogether twenty-five cases were presented, with seventeen deaths, seven recoveries, and one case of chronic hydrocephalus. Furthermore, there were four cases in which the laboratory results were engative, yet which had distinctive symptomatology and which ended fatally. Autopsy was performed on one but gave negative results.

At the centers bacteriologic experiments revealed the presence of intensive carrier (a family of gypsies) who, we assume, brought the epidemic from Valencia where an outbreak of cerebrospinal meningitis appeared in the summer of 1917 [Traiguera].

In some cases the germ was isolated in the cerebrospinal fluid. Colonies were raised in Dopter's medium in neutral red. The spinal fluid in all the cases was taken under sterile conditions and was divided into two parts, one for concentration to 37° and for sowing in the medium mentioned, the other for chemical and microscopic study, Vincent-Belloc reaction (at 50°) and reaction of the complement with Berna serum.

In the course of the illness slight turbidity of the spinal fluid was noticed at the outset, intense albuminosis (two to three grams) marked polynucleosis and the presence of meningococci, usually free and occasionally phagocytic. The germ is gram negative, diplococci in the shape of coffee beans. The second and third punctures show greater turbidity with an intense degree of polynucleosis and fewer germs which are

more phagocytic (bacteriolysis). On the other hand cultures of the concentrated fluid gives abundant germs which we used to sow plaques of Dopter sugar medium. The colonies are scanty at first and easily present forms of degeneration. They ferment glucose and levulose, but do not ferment maltose. The agglutination test is positive at 50°, although only low figures are obtained.

This epidemic had the following principal characteristics: It shows a predilection for children. There is a long interval between invasions. There is clearly marked bacteriologic and epidemiologic transmission of germs. Slightly phagocytic germs are present in the spinal fluid. In media of cultivation the germs degenerate easily and are with difficulty obtained in the early stages. There was a coincidence of some cases of cerebrospinal meningitis caused by the gram positive germ of Jäger in a nearby town of the same province, the cases also ending in death. [Author's abstract.]

Hine, T. A. M. SERUM TREATMENT IN CASES OF CEREBROSPINAL FEVER. [Br. Med. J], September 18, 1920. J. A. M. A.]

In this communication the author summarizes his findings as follows: (a) the serum must be administered reasonably promptly to be of value; (b) it is of the utmost importance for proper treatment to ascertain the type of coccus at the earliest moment possible, as therein lies the only chance of applying curative serum scientifically; (c) the importance of giving the serum in adequate quantities and resolutely sticking to the treatment.

Worster-Drought, C. THE TREATMENT OF CEREBROSPINAL FEVER. [Journ. of Neurology and Psychopathology, 1920, May, Vol. I.]

After a brief review of serum therapy in cerebrospinal fever during the war, the author advocates treatment by the intrathecal administration of antimeningococcal serum, daily or occasionally twice daily, until clinical improvement is undeniable and organisms have disappeared from the cerebrospinal fluid; following the period of serum administration, which should not be less than four days however great the improvement may appear, lumbar puncture is performed each day until the cerebrospinal fluid is quite clear to the naked eye. With this method, hydrocephalus as a complication is very rarely seen. Vaccines are also employed, their use being considered to be of chief value in the later stages of the disease; administration begins within the first three days of treatment with an initial dose, for an adult, of 250 million organisms. A further dose is then given every fourth day; after 500 millions each dose is increased by 250 millions up to, if necessary, 2500 millions. Polyvalent serum and polyvalent vaccine is used until the meningococcus has been isolated from the cerebrospinal fluid or nasopharynx and the "type" identified. A corresponding serum and autogenous vaccine are then substituted. Of 72 cases of cerebrospinal fever of all clinical type

treated by these methods, 57 recovered and 14 died: of those proving fatal in no case was death due to internal hydrocephalus, the types being either of the fulminating, acutely fatal, or progressively purulent. Of the 57 cases recovering showed temporary symptoms of generalized hydrocephalus subsequent to the first week. The average duration of the course, as estimated from the day of onset irrespective of when treatment started to the day on which normal cerebrospinal fluid was first obtained, was fourteen days.

During the premeningitic stage of the disease, antimeningococcal serum should be injected intravenously in doses of 200-600 c.c. Provided competent assistance is available the author has not found that general or local anesthesia is necessary or desirable as a general rule for the performance of lumbar puncture and the administration of serum in cerebrospinal fever cases. The intrathecal doses of serum are 30-45 c.c., the subsequent serotoxic reaction being no more severe in cases receiving the larger quantity. As regards children, in relation to age, the doses are: 1 to 5 years, 5-15 c.c.; 5 to 10 years, 10-20 c.c.; 10 to 19 years, 20-40 c.c. Injection by the gravity method is invariably employed and in many hundreds of serum administrations by this method, the author has never seen indications of respiratory failure or collapse. With certain exceptions, the amount of serum injected should be at least 5 c.c. less than the amount of cerebrospinal fluid withdrawn; provided there are no indications of hydrocephalus. [Author's abstract.]

Ponder, C. W. MENINGOCOCCUS CARRIER QUESTION. [Br. Med. J., September 18, 1920.]

Working with the best possible mediums under ideal conditions, Ponder was able to detect a much larger proportion of carriers where there had been no case of cerebrospinal fever than most observers, working under more difficult conditions, generally obtain among actual contacts. He asks whether this result is not sufficient to show that the finding of a few positive contacts in the usual circumstances has no meaning, and their isolation consequently no value. [J. A. M. A.]

Goldstein, Manfred. CLINICAL PICTURE AND THERAPY OF MENINGITIS CEREBROSPINALIS EPIDEMICA. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1917, Vol. 35, p. 395.]

The cases of meningitis epidemica observed during two years of the war occurred at all seasons of the year, but most frequently in fall and winter though there were also many cases during the summer. It was usually young men who were affected in the ages of from 20 to 22 years. The material which fell to the author's attention was divided into four groups, according to the severity of the disease, the therapy indicated, and the outcome. In the first group were the mild and abortive cases resembling a catarrhal attack, which were cured by urotropin and lumbar puncture. It is important to recognize these cases because of the

danger of bacillus carriers. The second group embraced the cases of more severity with slight stupor but without complications, cured after two or three intralumbar injections of meningococcus serum. The third group was characterized by the severity of the somatic and psychic disease picture, but these cases also were cured by repeated lumbar puncture and intraspinal serum injection without leaving behind any defects of the central nervous system or of the sense organs. In the fourth group were included the septic cases, both those with and without other infectious complications. In this group those accompanied by exanthem were of special differential diagnostic interest. The total mortality was only 15 per cent., due doubtless to the early recourse to lumbar puncture and intraspinal serum injection. The intralumbar use of protargol, kollargol and other drugs recommended in recent times, in the author's opinion, is open to objections these drugs are not harmless for the meninges and their use may result in serious complications. [J.]

Mouriquand, G., and Deglos. RELAPSES IN CEREBROSPINAL MENINGITIS. [*Lyon Médical*, 1920, CXXIX, July 10, p. 577.]

The writers report to the Medical Society of the Lyons Hospitals a case of relapse in cerebrospinal meningitis. A young soldier had a typical attack in February, 1918, with purulent cerebrospinal fluid and meningocci. A month later he appeared to have recovered, but he then had a relapse, with headache, somnolence, vomiting, Kernig's sign, turbidity of the cerebrospinal fluid and hyperalbuminosis. Some stiffness of the neck persisted, with spontaneous pains in lower limbs and slight pain on pressure over the lumbar vertebra and muscles. Early in July he had severe lumbar pain which came on during an abrupt movement which he made while in bed. Then he had very great stiffness of the spinal column. Four days later vomiting, profuse diarrhea and severe headache. The spinal fluid was purulent and under great tension. During the next two days the meningeal symptoms increased, with opisthotonus, headache and dysphagia. Death on July 11th. Necropsy showed tracks of pus on the internal aspect of the cerebral fissures; the lateral ventricles were greatly distended with pus; the two ventricles communicated. In the lumbar cord there was a veritable sheath of pus, a suppurative pachymeningitis. The pia was thickened and infiltrated with pus, but the circulation of the cerebrospinal fluid appeared to be free. In the lumbar cord there were numerous purulent recesses capable of explaining the return of meningococcal activity. The writers emphasize the importance of recognizing (1) a possibility of relapse in cases of cerebrospinal meningitis thought to be cured; (2) that the presence, in their apparently recovered case, of slight meningeal signs—slight stiffness, pain on pressure over the vertebra and muscles in the lumbar region—is explained by the persistence of an old pachymeningitic process, associated with purulent recesses which probably acted as points of departure for a reinfection of the cerebrospinal axis; so that

we should assure ourselves of its perfect integrity before we definitely affirm recovery; (3) the existence of a pyocephaly, independent of the spinal processes, for which a trepanopuncture should always be considered and practised if the patient's state permit. [Leonard J. Kidd, London, England.]

Popper, Erwin. ORGANIZATION OF SENSORY CENTERS OF THE CORTEX. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. 51, p. 310.]

The author brings further evidence in confirmation of the theory previously advanced by him (1918) that in the posterior central convolution beside centers which, to a certain degree, belong to definite members there is also a representation of a sort of functional mechanism, whereby an injury may cause the loss of the function as a unity or may bring about a condition of stimulation affecting the same. One of the cases described by the author was that of an old woman in whom, as consequence of an encephalomyelitic insult, beside hemiparetic phenomena, disturbances of sensibility had set in, affecting solely the finger tips of the paralyzed upper extremity with exclusion of the thumb (as in the author's other cases). A second case showed even more clearly the disturbance of sensibility in the finger tips, considered as a functional entity. This was a case of hemiparesis on the left as result of a cerebral softening. Sensibility was objectively fully intact. During the patient's stay in the clinic seizures, evidently of cortical epilepsy, made their appearance on several occasions. At first there was a peculiar feeling in the four (ulnar) fingers which the patient described as "tingling," lasting for several minutes. The feeling soon lost its tingling character and became more painful and at the same time was no longer confined to the finger tips, but involved the whole hand and underarm and extended finally over a still larger area. Thus in this case the author notes, as in previous cases published by him, there is a sensory phenomenon involving the tips of the four ulnar fingers, and indeed here a paroxysmal excitability of this region. But this case presents a new feature in the sense that the character of the feeling remained unchanged only so long as the disturbance was confined to a certain area; as soon as the area was extended there was an alteration in the phenomenon, seemingly of qualitative character, raising the question whether the localization for the sensibility of the four fingers is not also connected with a particular qualitative sensation—a view confirmed by the highly specialized character of the sense of touch in the finger tips. The author is not wholly convinced that the disturbance of sensibility of the fingers as a whole is due to a definite spacial localization, but believes he does not go too far in assuming a diffuse injury of elements constituting the mechanism of a definite functional entity, following suggestions of Monakow. There may not be an actual chain of lesions producing the disturbance, but the centers may be connected by lines representing the function, at least in the sense of its phylogenetic significance,

in such a way that there results not only a loss of function of the highly specialized sense of touch in the finger tips as a whole, but also an excitation of the same areas. Further the finger tips seem to constitute a functional entity not only for the act of touch but also in the psychological idea, for here too the finger tips undoubtedly play the leading part. Parallels are drawn with certain localized lesions affection functions of the eye. [J.]

Van Valkenburg, C. T.

1. "SENSIBLE POINTS" ON THE HUMAN CEREBRAL CORTEX. [Nederl. Tijdschrift voor Geneeskunde, 1914, I, No. 23.]
2. FOCAL LOCALIZATION OF SENSIBILITY ON THE HUMAN CEREBRAL CORTEX. [Zeitschr. f. d. gesamte Neurol. u. Psych., Bd. 24, Heft 2/3, 1914.]
3. A DOUBLE REPRESENTATION OF SENSIBILITY ON THE HUMAN CEREBRAL CORTEX. [Nederl. Tijdschrift voor Geneeskunde, 1916, I, No. 24.]
4. SENSORY DIVISION OF THE POSTERIOR COLUMN TYPE AS A RESULT OF FOCI IN THE REGIO ROLANDICA. [Zeitschr. f. d. ges. Neur. u. Psych., Bd. 32, Heft 2/3, 1916.]
5. PARALLELISM BETWEEN CUTANEOUS AND DEEP SENSIBILITY. [Arch. Néerland. de Physiol. de l'homme et des animaux. T. i. livraison 4. 1917.]
6. ON THE ORGANIZATION OF SENSIBILITY IN THE CEREBRAL CORTEX. [Psych. u. Neurol. Bladen, 1918, No. 3.]

In 1914 the writer found, while elaborating and extending Cushing's experiments, that in the gyrus centralis posterior there exist well defined points connected with cutaneous sensibility of the contralateral arm (thumb, little finger, other fingers, wrist, elbow) and trigeminus; the point for the thumb borders upon that of the corner of the mouth. The war experiments published corroborate these statements. The question arises which qualities of sensibility have their cerebral endings at these points?

Clinical cases with autopsy—*intra vitam* or *postmortem*—published in 1916 (No. 3 and 4) have been analyzed by the author. In the gyrus centralis posterior we find the endings of those fibers which are the physiological continuation of the posterior columns of the medulla spinalis. The stimuli conducted to the tractus spinothalamicus arrive along more scattered fibers in the cortex, part going to that of the gyrus centralis posterior, part to a more caudal portion of the retrorolandic region. Taking as a starting point the phylogenetic difference between these paths, the one for the posterior column sensibility, the other for lateral column sensibility (apart from cerebellopetal impulses), the author develops his views on their biological meaning which contributes directly to the interpreting of physiological clinical facts. Other experiments

(No. 6) on a certain localization of a regional character within the so-called tractus spinothalamicus gave a further contribution to the conception of a close connection between this tract and widely separated fiber endings in the cortex. In No. 5 the author endeavors to draw a parallel in every sense between cutaneous and deep sensibility according to their belonging in the group of the posterior column (phylogenetically young, cerebropetal) or in that of the lateral column (phylogenetically old, bulbo- and cerebellopetal, in the second instance cerebropetal). [Author's abstract.]

Franz, S. I., Lashley, K. S. HABIT FORMATION AND DECEREBRATION. [Psychobiology, Vol. 1, No. 1. J. A. M. A.]

The question propounded by Franz and Lashley and which led to making the experiments reported in this paper, viz., Do rats retain habits of recent formation after the destruction of certain cerebral regions? is answered in the affirmative. Rats were taught to ramble through a simple maze and then portions of the anterior cortex were removed surgically. Later the rats were placed in the maze and their actions noted. It was found that the rats which were not overtrained required 29 per cent. less time for the first fifteen trials after the destruction of the frontal lobes and made 53 per cent. fewer errors than they did in learning the maze. This in itself is evidence for a partial retention of the habit. In fact, as a whole, the experiments show that in the white rat the removal of large parts of the frontal portions of the brain does not greatly interfere with a learned reaction. The authors regard this as being the more remarkable since it seems probable that the so-called motor area is in that region and that in most, if not all, of the cases there was a destruction or abolition of the motor connections. While it cannot be concluded with certainty, yet it seems likely that the motor derangements which were exhibited by many of the rats were due to the interference with the normal efferent impulses and not to the general anemia (from the hemorrhage of the operation). Some of the animals also showed obvious disturbances of sensibility, the observations indicating that in some the stimuli to the vibrissae and olfactory stimuli did not give normal effects. In view of the importance of these two forms of sensibility in the rat's reactions, the authors are led to wonder whether these retain their predominance in the animal's learned activities, or are replaced by other forms of sensibility, such as the general kinesthetic. Although the results give plain evidence of noninterference (relative, to be sure) with learned reactions when the frontal portions of the brain have been destroyed, they also suggest that the habit reaction is not necessarily cortical in these animals.

Sierra, A. M. FUNCTION OF FRONTAL LOBES. [Semana Médica, March 4, 1920.]

This patient, a physician, had a chronic empyema in both frontal sinuses. As a result there was pressure on the poles of both frontal

lobes. The chief neurological disorder are apraxia, the correct usage of a fork, spoon, etc., being lost. He could name them but as a savage might. He would eat from the plate with his hands. A complete recovery followed three weeks after operation.

Marie, P., and Behague, P. FRONTAL LOBES AND SPACE ORIENTATION. [Rev. Neur., Vol. 26, No. 1.]

Deep lesions of the prefrontal region cause disturbance in the sense of space in the absence of any objective sign of injury of the nervous or vestibular system. There is very slight tendency to headache, dizziness or temporary dimness of vision. The disturbance in orientation is solely in the sense of direction while the idea of time seems to be normal.

Isola, A., Butler, C., and Fournier, J. C. M. OXYCEPHALIA AND DWARF GROWTH. [Anales de la Facultad de Medicina, Montevideo, May-June, 1920. J. A. M. A.]

The woman in the case illustrated is 21 years old and 1.3 mm. tall, totally blind, with reducible exophthalmos and horizontal nystagmus. The skull shows scattered depressed where the convolutions of the brain have exerted abnormal pressure on the inner table, inducing rarefaction. At the age of 2 years vomiting and headache were followed by progressive loss of vision. The retrospective diagnosis is that an attack of hydrocephalus injured the pituitary early in life, and the dwarf growth was secondary to this.

Jackson, T. S. CRANIOCEREBRAL INJURIES. [Ohio State Med. J., August, 1920.]

A soldier sustained a severe head injury from a large fragment of shell case which entered the right occipital lobe carrying with it a portion of cap, hair and fragments of bone. Twelve hours after injury the semiconscious patient had removed all damaged skull tissue, but could not follow out the en bloc method. The damaged brain tissue, indriven bone fragments and foreign bodies were removed. A few months after operation about the ascertained signs of his injury were the occipital depression, and an almost complete hemianopsia.

Figueira, F. CEPHALOPLEGIC SYNDROME IN CHILDREN. [Arch. de Méd. des Enfants, September, 1920.]

This syndrome, as occurring in Brazil, is fully discussed and reports of four new cases added of the patients. Ages ranged from 9 months to 3 years. Of eleven personal cases there had been general symptoms, fever, catarrh, diarrhea, vomiting or constipation in at least 80 per cent. The tendon reflexes were variable. In from five to twelve days they all recovered. The cephaloplegia is of the flaccid type, the child being able to move its head sideways. A comparison is drawn between this finding and the rare cases of paralysis of the neck among the 8,188 cases of epidemic poliomyelitis he has collated. The prompt recovery, the

absence of sweating, of rigidity of the neck, the normal findings in the cerebrospinal fluid, and the sudden onset of the cephaloplegia, usually on waking, are among the chief diagnostic points. This syndrome, however, was observed at a time when an epidemic of poliomyelitis was prevailing.

Todde, C. DOUBLE ACQUIRED ATHETOSIS. [*Rif. Med.*, June 5, 1920.]

This young woman developed a double athetosis. It was accompanied by pain in the lumbar region and there were contractures interfering with swallowing, chewing and speaking. The condition has persisted almost stationary during three to four years. The movements subside somewhat in repose and almost entirely during sleep. Some lesion in the cortex complicated with chronic changes in the spinal cord and nerves are suggested as the localization diagnosis.

7. NEUROSYPHILIS.

Brown and Pearce. GENERALIZED SYPHILIS EXPERIMENTALLY PRODUCED IN THE RABBIT. [*Med. Rec.*, August 14, 1920.]

In 126 cases of experimental syphilis in rabbits the animals showed lesions at the site of the inoculation. The testicles and scrotum showed marked reactions. If a lymph node from an infected rabbit were planted into the testicle of a normal rabbit, the organism could be recovered, from seven to a hundred days after the transplantation, from the blood of the heart of the second rabbit. If, forty-eight hours after its inoculation, the testicle of the second rabbit was amputated, the dissemination of the treponema was not prevented from occurring.

Moure, E. J. SYPHILITIC INTRACRANIAL COMPLICATIONS OF OTITIS. [*Bull. de l'Acad. de Méd. de Paris*, May 11, 1920. J. A. M. A.]

Moure urges tentative treatment as for syphilis when otitis media and mastoiditis display certain unusual features or are particularly tenacious. In several cases the functional disturbances persisted after the mastoiditis and otitis were evidently healed, and the Wassermann test gave positive findings, except in one case, but in all, the treatment for syphilis was followed by a prompt cure. A recurrence in one case confirmed his diagnosis, as necropsy revealed the softening of a gumma in the cerebellum as the cause of the fatal acute meningitis.

Kyrlé, Brandt, and Mars. COLLOIDAL GOLD TEST IN THE CEREBROSPINAL FLUID IN SECONDARY SYPHILIS. [*Wien. klin. Woch.*, August 19, 1920.]

As a result of tests in nearly two thousand instances these authors maintain that a strongly positive colloidal gold reaction is of considerable prognostic importance in secondary syphilis, as it shows that the infection of the spinal fluid has not yet cleared up, and that exacerbations of the disease may occur.

Dekenga, K., and Platenga, H. J. M. THE SACHS-GEORGI REACTION. [Nederland. Tijdschr. v. Geneesk., May 8, 1920.]

Comparative observations on the Wassermann reaction and Sachs-Georgi reaction are here reported upon, based upon an examination of several hundred serums. They conclude that in serums with a decidedly positive Wassermann reaction the Sachs-Georgi reaction was also positive as a rule, but occasionally exceptions occurred. In serums with a weakly positive Wassermann reaction the Sachs-Georgi reaction was repeatedly negative, while the opposite condition—a negative Wassermann and a positive Sachs-Georgi—was also sometimes observed. It seems that as a result of treatment the Sachs-Georgi reaction becomes negative more rapidly than the Wassermann reaction. It is not yet justifiable to trust to the Sachs-Georgi reaction alone, though it is of value if carried out in association with the Wassermann reaction to the general summary reached.

Eckel, G. M. ANALYSIS OF ONE HUNDRED CASES OF NEUROSYPHILIS. [South. Med. J., September, 1920.]

In this group of 100 cases analyzed forty-four were tabes dorsalis, 30 per cent. of which were females and 70 per cent. males. Thirty-one was the youngest and the oldest fifty-eight. Date of onset of symptoms from the initial lesion varied from three to twenty-one years, average eleven years. Wassermanns done on the tabetics' blood, 45 per cent. showed negative, and of these only three became positive after provocative treatment. There were twenty-one cases showing great exhaustibility, exaggerated reflexes and usually hyperactive pupils easily fatigued; five cases of Erb's syphilitic spinal paralysis; sixteen cases of sciatica varying from subacute to chronic forms with atrophy and paralysis; seven cases of optic atrophy. Other cases show syndromes resembling multiple sclerosis, chronic recurring tetany, amyotrophic lateral sclerosis, bulbar palsy, progressive muscular atrophy, and one syringomyelic syndrome was of syphilitic origin.

Plaut, F. THE SACHS-GEORGI FLOCCULE FORMATION REACTION IN SYPHILIS. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. 52, p. 193.]

The close relationship between the floccule formation and the complement fixation reaction was known even before the discovery of the Wassermann reaction, but efforts to make use of this principle to obtain a reliable reaction of simpler technic than the Wassermann had long been unsuccessful. Sachs and Georgi, however, have elaborated a method which promises good results. They make use of the interactions obtained when the sera and spinal fluids to be examined are brought into contact with alcoholic extract of ox heart reinforced with cholesterin which was found by Sachs and Altmann to be so admirably adapted for the Wassermann reaction. By means of this simple method of floccule formation reaction Sachs and Georgi were able to attain results which

corresponded with those of the Wassermann reaction in a high percentage of cases. The method is of special interest for psychiatry as it is applicable for the spinal fluid. The prescription for the examination of the serum is as follows: 1 c.cm. of serum from the patient, previously rendered inactive by warming for one half an hour at 55 to 56 degrees thinned with tenfold 0.85 per cent. common salt solution is mixed with 0.5 c.mm. of alcoholic extract of ox heart reinforced with cholesterol thinned with 0.85 per cent. common salt solution. In the serum control the extract is replaced by a like amount of physiological common salt solution. As extract control 0.5 extract dilution with addition of 1 c.cm. of 85 per cent. common salt solution is used. The examination of the spinal fluid is undertaken in a similar way but with a larger amount of the fluid. The results are read off by means of the agglutinoscope, after the preparation has been placed in the incubator for two hours and afterward kept for from ten to twelve hours in room temperature. From the results of 500 serum tests the author concludes that in the great majority of cases (about 90.8 per cent.) the Sachs-Georgi reactions correspond with the Wassermann. The Wassermann shows a larger number of positive results in late syphilis and lues congenita; the Sachs-Georgi reaction in early syphilis. Notwithstanding a few positive showings in persons apparently free from lues the results do not contradict the specificity of the Sachs-Georgi reaction for syphilis. One hundred and fifty-eight spinal fluids were examined. The results with both methods were the same in 138 cases (87 per cent.), and were different in 21 cases (13 per cent.). The divergence showed itself only in the circumstance that at times the Sachs-Georgi failed to act while the contrary was never the case. At least 0.5 of the fluid must be employed. Aside from the cases where there were acute meningitic complications both the Sachs-Georgi and Wassermann reactions appeared only in syphilitic diseases, so that both may be regarded as proof of the syphilitic nature of an organic nervous process. Various experiments showed that the refining of the action for the spinal fluid resulted in a reduction of the specificity of the precipitations. The author sees prospect of a sensitizing of the reaction only in one way—by a moderate increase of the concentration of the extract. [J.]

Stanton, J. M. COLLOIDAL MASTIC TEST. [*Am. Arch. Neur. and Psych.*, September, 1920.]

The author here concludes that the mastic tests run about parallel with the findings by the colloidal gold tests in syphilis.

Stern, Felix. WASSERMANN REACTION IN NONLUETIC BRAIN DISEASE. [*Archiv. f. Psychiat. u. Nervenk.*, 1920, Vol. 61, p. 726.]

The anticipation expressed by Plaut, Rehm, and Schotmüller that the Wassermann reaction in the cerebrospinal fluid in nontropical diseases would furnish a specific or unambiguous sign for luetic affections

of the central nervous system, recent experiences have shown to be realizable only to a limited degree, and the Wassermann reaction in the spinal fluid has been frequently discovered in cases of meningitis of non-luetic origin. The majority of these cases are those who have suffered from a previous syphilitic infection, and Plaut maintains that this is the rule, stating that the increased permeability of the membranes permits the reagent to enter the cerebrospinal fluid from the blood. The author asserts, however, that the number of cases with positive spinal fluid and negative blood is far too great to permit them all to be considered due to errors in the experiments. The origin of this unspecific reaction is still hypothetical. The great diagnostic significance of the Wassermann reaction in the spinal fluid for neurological diseases is not reduced by these limitations, although it is apparent that the positive Wassermann can be accepted as evidence of luetic infection of the central nervous system only in connection with the other spinal fluid findings and the clinical symptoms. As it is of great semeiotic value to know the exceptional cases the author publishes one which occurred in his experience. It was that of a man, 20 years of age, who had never suffered from nervous disease nor from luetic infection. He had acquired a malaria tertiana from which he had not entirely recovered so that he was several times sent to the hospital because of recurrence of the disease. It became apparent that the patient was suffering from a lesion conditioning a heightening of intercranial pressure, which was diagnosed as a basal affection situated in the ponto-cerebellar angle—a condition confirmed by the autopsy. The nosological diagnosis was more difficult than the topical, however. No luetic affection could be assumed, yet the Wassermann in the cerebrospinal fluid was strongly positive. It was also difficult to decide whether the brain lesion was due to the malaria, in view of the fact Dürck and others had recently described anatomical findings in the brain in malaria perniciosa, accumulations of degenerative products, etc. But the autopsy revealed a sarcoma, proving a fortuitous concurrence of two genetically different diseases. The tumor was a simple nonspecific benign, well encapsuled sarcoma, without pronounced phenomena of regression, and it is well known that in these cases the spinal fluid is always negative. The reaction in his case, the author states, is therefore probably just as specific for malaria as, in luetic nervous disease, it is "specific" for lues; that is to say, it stands in immediate genetic dependence on the malarial infection. It may be assumed that in the malarial attacks an overflow of the complement-binding reagent from the blood into the spinal fluid takes place as result of heightened permeability of the meninges. So far as the author knows no proof of the reaction of the spinal fluid in malaria has heretofore been offered. [J.]

Stuart, D. D. V., Jr. EARLY CEREBROSPINAL SYPHILIS. [South. Med. J., November, 1920.]

The cerebral symptoms manifested themselves about eleven weeks after the chancre. The findings were: irregular left pupil; ataxia of gait and station; exaggerated deep reflexes, with unequal knee jerks; voice disturbance; mental impairment. Systemic treatment was followed by improvement. The importance of spinal fluid examinations in the earliest stages of the disease is discussed.

Aebly, J. A STATISTICAL STUDY OF THE LUES AND METALUES. [Archiv. f. Psychiat. u. Nervenk., 1920, Vol. 61, p. 693.]

The author holds the lack of understanding of the real significance of the mathematical presentation of observed material or the absence of essential data responsible for previous failure to solve important problems in connection with metalues. The following three aspects of the subject are of paramount importance: (1) the percentage ofluetics that later developed paralysis; (2) the problem of the "lues nervosa"; (3) the question regarding the efficacy of antiluetic therapy for preventing later luetic and metaluetic disease of the central nervous system. Reviewing the statistics given by Hudovernig and Gussmann, Fournier, Pilez and Mettauscheck and others, the author by applying a method which assumed a longer latency time (16 to 18 years) arrived at the conclusion that the percentage of frequency of paralysis assumed by most writers was too low and that it approaches or exceeds 10 per cent. This is in conformity with Fournier's finding, who in 5,749 cases of luetic infection found 631 cases of paralysis, or 11 per cent. This percentage of course does not represent the number of those actually suffering from luetic nervous affections at a given time compared with those suffering from luetic diseases of other nature, as during the long latency period many deaths would occur, which would materially affect the statistics. The question whether metalues is determined from the very beginning of the infection in the sense of being a distinct form has long been discussed but never decided. Fischer has attempted to solve the problem by statistics on the frequency of metaluetic disease from the same source of infection. The author states, however, that the material from which his figures were taken was much too limited to permit inferences and that Fischer is the victim of one of the most misleading errors of statisticians, namely, that of concluding from a difference of relative frequency in two groups that there is a difference of nature in the groups examined. The frequency of paralysis in the total ofluetics is a quantity of complex structure and the author is of the opinion that the problem of the lues nervosa can only be solved in direct way, that is, in experiences with infections which originate from the same source rigidly traced to the outcome in every instance. While there are some experiences of this sort which seem to be evidence of the existence of a lues nervosa, the

recev de la medaille is wanting—it is not proved that there are no cases, but those of the metaluetic character arising from the same source of infection. Discussing the influence of antiluetic therapy on metalues the author states that opinions can only be formed concerning the older Hg. treatment, as there is absolutely no statistical foundation for inferences concerning the more modern salvarsan therapy for the central nervous system. In order to form a judgment on this question from statistics it is necessary to compare two complementary categories. Fournier, Neisser, Schuster and others have made the mistake of comparing simply those treated with those not treated or insufficiently treated within the group of paralytics. Statistics of this sort are wholly worthless, and later students of the subject have followed in the footsteps of these pioneers. The author arrives at the conclusion that from the material at hand it is impossible to form a conclusion as to the efficacy of the Hg. treatment, and the main rôle in metalues is perhaps played by a factor upon which the therapy has no influence. The decision of this question may depend on whether or not a lues nervosa is at the foundation of the metaluetic disease. [J.]

Holfelder, H. OPERATIVE TREATMENT OF TABETIC GASTRIC CRISES.
[Therapeutische Halbmonatshefte, June 1, 1920. J. A. M. A.]

Holfelder holds still to the view that the cause of the gastric crises in tabes is an isolated pathologic condition of the sensory nerves of the stomach. The motor phenomena are from reflex action. By destroying the sensory nerves an end is made of the crises. The nerves can be temporarily blocked with paravertebral injection of procain, and this is his practice when the patient is too debilitated to stand thorough operative measures. The effect is immediate, but lasts only a few days; it can be repeated, while the patient is regaining strength for the Foerster operation. This he regards as indicated in all cases of pronounced gastric crises in which the participation of the vagus can be excluded. The latter can be suspected from the epigastric reflex and the coincident disturbances on the part of the heart and larynx. In this case treatment requires subphrenic severing of the terminals of the vagus at the cardia, according to Exner. But in the majority of cases, the sympathetic fibers in connection with the splanchnic nerves are the ones involved, and these can be severed at the only point where they can be isolated, namely, at the posterior roots. It is necessary to resect the nerves from the fifth thoracic to the first or second lumbar spinal nerves. This is done under local anesthesia, the patient lying face down, the head low, with a few whiffs of ethyl chlorid as the most difficult part of the operation, but it can be and must be done liquid-tight. As the motor function of the stomach is paralyzed by the operation, it is indispensable to conclude the intervention with gastroenterostomy.

Crance. TABES DORSALIS SIMULATED BY FOCAL INFECTION. [Med. Rec., April 10, 1920.]

This is a short report of the case of a man suffering from "lightning pains" and "a rope sensation round the waist," the pupils reacted sluggishly to light, Romberg's sign was doubtful, and the patellar reflexes were diminished but not absent. The gait was somewhat suggestive of ataxia. For nine years the patient received antisyphilitic treatment, but the pains gradually became worse. X ray examination showed the existence of several abscesses in connection with the teeth, the extraction of which was followed by a complete cessation of the subjective symptoms.

Piccinino. ELECTROPUNCTURE OF THE SPINE IN TABES DORSALIS. [Rif. Med., January 24, 1920. B. M. J.]

Electro-puncture by means of two needles, so as to avoid unnecessary shock after removal of a needle, is here advocated for tabetic therapy. The positive plate is placed on the neck or sacrum, and the needle attached to the negative pole and inserted from 1 to 2 centimeters into the skin and subcutaneous tissues. A current of 10 to 15 milliampères is used. As soon as bubbles of gas appear around the needle it is slowly withdrawn, and the second needle inserted before complete withdrawal. From 50 to 100 punctures can be made. As the proceeding is very painful, local anesthesia is advisable. In the particular patient treated, his troublesome incontinence of urine was almost completely cured by this treatment. The site of injections should be near the lumbar swelling—that is, just below the twelfth dorsal vertebra. What the dynamics may be is left unexplained.

Rubritius. TABETIC URINARY RETENTION. [Wien. klin. Woch., July 29, 1920.]

The author here records a case in which retention of urine of tabetic origin was remedied by removal of a wedge-shaped portion of the internal sphincter.

Salomonson, J. K. A. Wertheim. TABES WITH HEMIATHETOSIS. [Nederlandsch. Tijdschr. voor Geneeskunde, 1920, LXIV, H 2, 2622.]

Salomonson reports to the Amsterdam Neurological Society a case of tabes, in a man of fifty, with a hemiathetosis of right arm and leg. Ten years previously he had a hemiplegia, possibly as the result of cerebral softening due to luetic endarteritis; the only residue of this was the presence of a doubtful Babinski extensor or reflex and the hemiathetosis. At the time of clinical observation the cerebrospinal fluid was negative, but the patient had already had several courses of strong antiluetic treatment. [Leonard J. Kidd, London, England.]

Sprengel, Georg. MORPHOLOGICAL DIFFERENCES OF THE SPIROCHAETA PALLIDA IN THE BRAINS OF PARALYTICS. [Archiv. f. Psychiat. u. Nerven., 1920, Vol. 61, p. 480.]

Since Schaudinn and Hoffmann first announced the discovery of the

causal agent of syphilis writers have called attention to the variety of form under which these spirochetes make their appearance, especially to differences of caliber and length, with accompanying peculiarities in regard to motility, incubation time, etc. These facts are of importance because the question as to the existence of a virus nervosum has not yet been solved. Some authors, as Naguchi, being of the opinion that there are racial differences within the species which account for the neurotropy in certain instances. The author describes a case in which the forms spread extensively over different structures of the cortex, were very diverse, with predominance of the long thin type, the spirochetes being twice and in most instances three times as long as those usually found in paralytic brains, and having as many as 26, 30 or 32 spirals. There were also short thick forms, almost always appearing in swarms, as well as rolled and globe-like types. The distribution seemed to disprove any connection between the extraordinary length of the spirochetes and the appearance of the globular or conical types, but indicated that the appearance in swarms and the shortening and thickening of the spirochetes is in some way related to these formations. The author comes to the conclusion that taking into consideration the biological peculiarities of protozoa and the effect that different mediums would have on their development, there is no warrant for assuming an independent variety as responsible for injuries to the central nervous parenchyma. In syphilis of the central nervous system no definite type of spirochete has ever been determined and no special transmissible qualities have been discovered, and the same great variability of form prevails as in ordinary syphilis. In experiments with syphilis virus in animals the incubation period is always longer for the later stages and for this reason a longer incubation time would not be conclusive evidence of a virus nervosum. The author (with Ehrlich) thinks it probable that the neurotropy is due to the formation of branches of spirochetes with greater tendency to recidivation. But the different behavior of the nervous parenchyma as compared with that of the other tissues of the body in regard to these forms is still in need of explanation. [J.]

Gordon, A. A CASE OF TABES WITH UNUSUAL MANIFESTATIONS. [Philadelphia Neurological Society, October, 1920.]

The patient is a man, fifty years of age, an old tabetic. All the typical symptoms of the disease are present. Several months ago he commenced to suffer intense lancinating pain in the neck in the midcervical region. The pain radiated laterally. At the same time he observed that the inner border of the left scapula and its inner angle were receding from the thorax when at rest. As the function of the serratus and teres major is preserved, the rhomboid muscle is evidently involved. The latter muscle is innervated by nerves originating in the fourth to fifth cervical segments. The tabetic process has apparently extended upwards and reached the cervical cord. The other peculiarity in this case is

found in the unusually intense ptialism. Since the patient used mercurial medication for a brief period, a few weeks, and only two years ago, this drug could not account for the excessive salivation which has been in existence for the last two years. No other drug was taken by the patient that could be considered as a cause. The salivation is so pronounced that the sleep is interrupted frequently; the saliva accumulates in the throat so that he is wakened by the difficulty of breathing. Since the parotid, submaxillary and sublingual salivary glands are chiefly supplied by the sympathetic system, it is to be presumed that the latter is implicated in the tabetic process, evidently in its cervical portion. [Author's abstract.]

Simon. TABES AND SYPHILITIC ERUPTION. [Bull. Soc. Franç. de Derm. et de Syph., April 21, 1920.]

The patient, who nineteen years previously had had a chancre on the lip and had subsequently had no other signs of syphilis, showed a reddish-brown scaly eruption on the trunk and arms, belonging to the type of late syphilides described by Brocq as quaternary. Systematic examination of the nervous system showed an Argyll-Robertson pupil and loss of the knee and ankle jerks and medioplatar reflexes.

Browning, W. SPINAL SIGN IN GASTRIC CRISES OF TABES. [Med. Record, October 23, 1920. J. A. M. A.]

A point or small area of tenderness just to the left of the spinal column, corresponding to the fifth dorsal interspace or one at about that level is here described as a special spinal sign found in tabetics with gastric crises. It is always to be found on the same side as the stomach. It may extend to more than one space, though usually most marked at a definite level.

Barbé, A. MENTAL DISTURBANCES IN SYPHILITICS. [Presse Méd., July 7, 1920.]

The author reaches the oft-repeated conclusion that there is no special type of psychoses peculiar to syphilis. Syphilis, he repeats, like any infectious disease, can induce mental disturbances other than those of general paresis. The toxic-infectious syphilopsychoses are those of the secondary period, traceable to the meninges. They usually appear about the fortieth day after the primary lesion, and the onset is sudden, like a toxic delirium. Loehe has reported a case of Jacksonian epilepsy, coma and death, three months after infection, and hemiparesis has been observed, and one case of hemiplegia is on record, but there is nothing characteristic about the mental confusion or toxic psychosis of this phase except the improvement under specific treatment.

Marie, A., and Levaditi, C. TREPONEMA NEUROTROPUM AND PARESIS. [Rev. de Med., 1920, No. 4.]

According to these authors general paresis is due to a strain of treponema which they believe is to be distinguished from treponema palli-

dum, to which latter they apply the subspecies name *dermotropum*. Through cultivation in successive series of rabbits they maintain they can separate out the varietal characteristics. These varietal features they hold are (1) changes in the length of time of incubation, the neurotrophum requiring a longer incubation period; (2) in the rabbit the indurated chancre is characteristic of the dermatrope, the papulosquamous lesion of the neurotrophe; (3) the neurotrophe variety has a greater affinity for epithelial and vascular structures, the dermatrope variety for fibrous connective tissue and for endovascular structures; (4) slow evolution and spontaneous recovery in the rabbit of the neurotrophe variety; (5) virulence of the dermatrope variety in the monkey and in man as contrasted with the lessened activity of the neurotrophe variety, and (6) that animals made refractory to the type of germ are not so to the other.

The neurotrophe forms are not incapable of developing in dermatrope predilection territories, also how can one understand the prevailing modes of transmission. The authors are therefore pushed to assume for so-called parasymphilitic cases that a dermatrope organism may contain neurotrophe stock or vice versa, and thus obtain entry into tissues where by long residence they develop—for the neurotrophe—an exclusive neurotropic predisposition. The paper from the abstractor's point of view shows the typical exclusivist stand of neglecting an environmental interactionism as being a far more pregnant hypothesis, especially if an insight into the environment, *i.e.*, the bodily structure, includes the view of the organism as a whole, *i.e.*, with the mental strivings. Thus the far reaching work of Pötzl, Jelliffe, Adler, Hansemann and others showing how individual conflicts, by modifying metabolic activities, cause constitutional trends, which permit types of infections in organs, which become predisposed chiefly through the mental, *i.e.*, the socially adapting factors playing upon the individual.

Porot and Sengès. GENERAL PARALYSIS AMONGST ARABS. [Ann. de Méd., January, 1920. B. M. J.]

Porot and Sengès, who have had considerable experience of mental and neurological cases amongst the native races of Algeria, agree that paresis is extremely rare amongst them, and are inclined to doubt the diagnosis of the very few cases of general paralysis reported amongst North African natives. The rarity of paresis is peculiarly striking in view of the fact that syphilis is very widespread amongst the Arab population, and that positive Wassermann reactions of the spinal fluid have often been obtained by the authors and others. This immunity of the nervous system has been explained by the lower social condition of the natives, the comparative absence of the worries of modern civilization, and the uneventful lives of the people. But the Great War largely changed these circumstances; their active participation in actual fighting, with its physical and mental strain, certainly enlarged their field of experience and modified the factor of social inferiority. Nevertheless, during

three years' experience in the neurological center at Algiers the authors found only a single case of general paresis; this was a native non-commissioned officer who had had twenty years of military service. The evolution of the disease was very slow; in all probability he was the subject of the disease before war broke out, but he was able to undergo more than three years of European warfare before finally breaking down. The authors are inclined to associate the rarity of general paresis with the habitual absence of emotion and anxiety amongst Arabs; it is possible, however, as some have maintained, that the disease is due to a particular strain of the *Treponema pallida* which is not so widely disseminated as the ordinary virus.

Allers, Rudolf. STUDIES OF METABOLISM IN PROGRESSIVE PARALYSIS. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. 50, p. 174.]

Experiments which have been made in support of the theories and hypothetic interpretations of disturbances of metabolism in general paralysis are not so numerous as to render further confirmation superfluous. For this reason the author communicates the results of various experiments made by him. From the examination of the urine of nine paralytics he believes that changes in the purin metabolism may be regarded as established. There is justification for the assertion that in progressive paralysis, at least in the progressive phases and principally in the quiet dementing forms, the endogenous purin metabolism is disturbed in the sense of a relative increase of the purin bases, often to over 30 per cent. of the total purin nitrogen. Great variation in the total elimination of nitrogen independently of the quantity of urine passed have recently been referred to and was confirmed by the author's experience in thirteen cases. In nine cases he found concurrently with other disturbances of metabolism a reduction of the endogenous creatinin elimination without increase of creatin. The urine of 32 paralytics was examined for 96 days according to the method recommended by J. Bang for the presence of albumose. In ten cases a strong biuret reaction was observed. The occurrence of albumosuria in paralytics is interesting because it is observed in other diseases where there is destruction of tissues of the body. The inconstancy and small intensity of the reaction, however, render it improbable that this substance has any great significance for the paralysis. Besides no connection could be discovered between the fluctuations in the clinical picture and the albumose findings. Thus, on the whole, the tentative and hypothetical assumptions concerning the disturbances of metabolism in general paralysis seem to be confirmed by the author's experiments.

Brouwer, B. TROMOPARALYSIS TABIOFORMIS CUM DEMENTIÂ. [Nederland. Tijdschr. voor Geneeskunde, 1920, LXIV, September 4, 963.]

Brouwer reports to the Amsterdam Neurological Society a case of the disease tromoparalysis tabioformis cum dementiâ, which was first

described by Wertheim Salomonson (*Neurol. Centralblatt*, 1900). A pensioned soldier, 66, began four years ago to suffer from tremor in his right hand, chiefly thumb, and from psychical changes which were diagnosed as paralytica dementia. Wassermann + 0.7 in serum, + 0.5 in lumbar fluid, positive Nonne-Apelt reaction and pleocytosis (82). Patient declined antiluetic treatment. In March, 1920, strong tremor in arms and legs, worse on right side, exactly like that of paralysis agitans; head and trunk not affected. Movements slowed and diminished tonus in limb muscles; typical mask-like facies; speech monotonous, soft and slow. Left pupil no light reaction, right hardly any, convergence reaction present. No true palsies, no sensory disturbances, preservation of tendon jerks and abdominal reflexes, plantars flexor. No ataxy. Typical dysdiadochokinesia in both arms. Eye grounds and visual fields normal. No affection of sympathetic system. Extremely slight bladder symptoms. Undeniable dementia, but not severe (poor memory and fixation). No delusions, no hallucinations, no mood-anomalies. A loud bubbling systolic aortic murmur. No albumen or sugar in urine. Sachs-Georgi reaction + 0.6. Unknown to the patient, forty sublimate injections were given; there was improvement in his psychical state, so that dementia could not be demonstrated; negative blood Wassermann; no change in the tremor, stiffness or aortic murmur. In this case we have signs suggestive of paralysis agitans with lues cerebri; it most nearly resembles Salomonson's tromoparalysis tabioformis cum dementia. He regarded it as a special disease, others as a combination of tabes and paralysis agitans. Brouwer dissents from the latter opinion, for the disease shows a very peculiar tabes and a rather peculiar paralysis agitans. In his case there was no ataxia, no form of pulsion and no typical attitude of paralysis agitans. And the peculiar dementia does not belong to either tabes or paralysis agitans. Its probable cause is lues of the central nervous system, with a special localization. It is uncertain whether in the earlier recorded cases lues was present, for the luetic reactions had not then been discovered. Brouwer suggests that a careful revision of this question by modern methods is desirable. [Leonard J. Kidd, London, England.]

2. EPILEPTIC GROUP

Poppelreuter, W. BLOOD PRESSURE FROM BRAIN WOUNDS AND EPILEPSY. [*Monatsschr. f. Neurol. u. Psychiat.*, 1918, Vol. 43, p. 335.]

In war experiences one of the most interesting problems to arise was why, among soldiers suffering from brain wounds, some developed epilepsy while others did not. Seeking a fundamental factor distinguishing these two groups which might suggest a clue to the cause of the different reactions, the author discovered that those individuals who developed epilepsy after brain wounds had a much higher blood pressure than those free from epileptic convulsions. The higher the blood pressure was,

the more probable was it that the case was epileptic, and epileptics with low blood pressure, on the other hand, could be regarded as exceptions. This high blood pressure is a permanent phenomenon. It is probably due to an exaggerated tonicity of the vasomotor center of the medulla oblongata. [J.]

McKenna, T. M. T. OBSERVATIONS ON EPILEPTICS AND ON EPILEPSY, FROM RÖNTGEN RAY STANDPOINT. [Am. Arch. Neur. and Psych., September, 1920.]

Ninety cases were examined by McKenna. The results of the röntgen ray findings were: Tumors or evidence of pressure in the interpituitary area, 9 cases; bony deposits, 52 cases; small area, 10 cases; calcareous degeneration, 2 cases; cerebropathy (this is not shown by the röntgen ray), 9 cases; no changes, 8 cases; total, 90 cases. Twenty-four cases occurred in persons over 35 years of age. More than 50 per cent. of these cases being known to be due to an organic affection of the gland, causing it to be inefficient, would be a strong argument in itself for the conclusion that the other cases must have inefficient pituitary glands for some cause or causes. In some cases in which there was evidence of pressure in the pituitary area, McKenna has been able to have a röntgenogram made again in one or more years and has, in some instances, found that there was no progression. It would seem that if these cases are struma or other tumor growths the process of enlargement had ceased. It is possible that some of them may be simply hypertrophy. The question of pituitary feedings in epileptics, in the author's opinion, is an important one. McKenna has found that the extract of the whole pituitary gland in 2 grain doses, three times a day, and given four hours after eating, is the most satisfactory treatment. Bromids should always be used in conjunction with the pituitary extract. He is in the habit of using from 45 to 60 grains of bromid daily. After one year less bromid can be used, but the pituitary feeding must be kept up indefinitely, probably during the life of the patient. [J. A. M. A.]

Bossard, A. LEUCOCYTES IN GENUINE EPILEPSY. [Schweizer Archiv. f. Neurol. u. Psychiat., Vol. 1, No. 2, p. 269.]

Leucocytosis is a phenomenon which quite regularly accompanies epileptic convulsions. This leucocytosis in epileptic attack is distinguished from physiological leucocytosis after exercise, not only by the absolute higher number of leucocytes, but also because of the early appearance of the lymphocytosis and mononeucleosis. This early appearance of the lymphocytosis is due to the circumstances that at the very beginning of the attack there is an active influx into the blood of lymphocytes from all the organs containing these elements (lymph glands, lymph vessels, thoracic duct and spleen), probably brought about by nervous disturbance. The polynuclear leucocytosis which is now and then observed hours before the convulsions probably belongs to the inflammatory

type and it not essentially conditioned by the attack. Yet it is to be assumed from the manner in which this phenomenon arises that it is due to the same pathological moment as the convulsion. The leucocytosis may be used in differentiating epilepsy from simulation and probably from hysteria. [J.]

Block, E. Bates. ON THE ETIOLOGICAL RELATION OF WORMS TO EPILEPSY.
[Section on Nervous and Mental Diseases, American Medical Association, April, 1920.]

The author considers two problems: (1) *Are we justified in regarding worms as one of the causes of epilepsy?* Statistics are given in which there was a definite report on the presence or former presence or absence of worms or eggs in the stools in 100 of his private cases, which showed 56 per cent. were negative and 44 per cent. positive. This is compared with: the report of the Rockefeller Sanitary Commission which showed 32.49 per cent. positive; the report of Gage and Bass which showed 20.7 per cent. positive; the report of the Georgia State Board of Health which showed 25 per cent. positive. As to the usual frequency of epilepsy, it varies in different countries from 1 to 2,000 to 1 to 500, while Ammann gives 5 per cent. for the population in Switzerland. In Block's private cases 6.4 per cent. had epilepsy, the high frequency being due to the neurological character of his practice. As to the number of people in Georgia who have worms, he finds 5 per cent. of these also have epilepsy. Attention is called to the fact that more epilepsy and also more worms occur in the country than in the city, and more in warm climates.

From these statistics the author feels justified in acceding worms as one of the causes of epilepsy.

(2) *The question is then considered as to how worms cause epilepsy.* The following possibilities are then considered: (a) The general ill health of the patient. (b) Reflex irritation as a factor in a summation of stimuli. (c) The production of toxins by the intestinal parasites. (d) The possibility of the actual invasion of the brain by the larvae of the worms.

In discussing the last theory the author calls attention to the rather numerous cases of invasion of the brain by the larvae of *T. solium* and *T. echinococcus*, and the known invasion of the body generally by *T. saginata*, by hookworm and *Trichina spiralis*, *paragonimus* and other parasites. Invasion of other organs by the *Ascaris lumbricoides*, *oxyuris* and *Trichocephalus dispar* is also discussed. A number of cases are reported to show that cysticercus may be present in the brain without any intestinal parasites being present.

Attention is also called to the fact that cases of epilepsy with worms are usually not cured by getting rid of the intestinal parasites. He therefore concludes that there is reason to believe that epilepsy when produced by animal parasites is due to the actual invasion of the brain

by the larvae. Also that the absence of worms or eggs in the stools is not proof of the absence in other parts of the body. [Author's abstract.]

Bychowski, Z. IS THERE A REFLEX EPILEPSY? [Neurol. Centralbl., October 16, 1920, No. 20, Vol. 37.]

The question of reflex epilepsy was brought up for discussion in the sixth annual meeting of German nerve specialists at Hamburg after the Binswanger-Redlich paper. The attitude toward reflex epilepsy was very skeptical, amounting almost to a rejection of this form. The author remarks that it is very interesting to follow the manner in which reflex epilepsy has lost importance of late years; recent monographs scarcely mention it, while, in older ones, it is given an almost first-class place. Brown-Sequard's publications in their time did much to establish the theory of reflex epilepsy. He succeeded, by stimulating the sciatic nerve, in producing epileptic attacks in guinea pigs and rabbits, indeed in making these attacks hereditary. In recent years Macieszka and Wrzosek have undertaken a fundamental test of Brown-Sequard's experiments and have arrived at wholly negative results. There are probably numerous published cases of reflex epilepsy which were not epilepsy in the strict sense of the word, and Binswanger says that many of the cases of reflex epilepsy reported by him and others have, on more careful examination, turned out to be hysteria. The author himself has never seen a case of reflex epilepsy, having at most observed a few cases that might have been interpreted in this manner, and his experience confirms his view that epilepsy is an organic brain disease. It would stand to reason that if the theory of reflex epilepsy is true, the war experiences should furnish examples of this disease. If cicatrices of the peripheral nerves could really produce epileptic attacks, then, in the great number wounded in the war, such cases would not be rare, especially as the material is of a highly nervous character. In many cases of injury of the sciatic nerve only one case fell under the writer's observation where the epileptic attacks might be considered to stand in connection with a painful cicatrice in the region of the N. plantaris, but in this case the causal connection was by no means proved. With this exception the author, notwithstanding special search with this problem in view, has been able to find no case where reflex epilepsy was even suggested by the conditions. [J.]

Clark, L. Pierce. IS ESSENTIAL EPILEPSY A LIFE REACTION DISORDER? [Am. Jl. Med. Sc., December, 1919.]

For years we have known that many if not most essential epileptics possess a peculiar makeup. These special potentialities of the epileptic exist from birth and may be detected years before actual fits. We have also learned that from the nature of this mental makeup the epileptic adjusts to new adaptations with greater difficulty than the average normal individual. It has been held and partly proven that the fit itself

is a protective and regressive phenomenon. The degree and kind of regression has not as yet been carefully studied. To this end we have undertaken still more recently to analyze the mental content of the transitory deliria or automatism associated with mild epileptic seizures. As a result of a study of this brief delirious content in epileptics, which is apparently not dissimilar to the more protracted deliria content in some of the psychoses, we have obtained a more or less free access to the unconscious. As a result of the study of varying depths penetrated or uncapped in the seizures we have obtained a knowledge of the difficult stresses which apparently have caused perturbation in the mental life of the epileptic. In the deeper contents of regression in the fit the desire and strivings with which such individuals' minds are engrossed have been uncovered. Finally we have taken this mental content for a basis of therapeutic analysis somewhat similar to that which has been employed in ordinary dream analysis. The therapeutic results by such a procedure have been very encouraging indeed, both in the lessened frequency of epileptic attacks and, what has been of more significance, it has resulted in great improvement of the whole life reactions of the epileptic. The marked advantage of the method as a whole seems to rest in no small degree upon the amount of insight which the epileptic may obtain and the solving away of the conflicts which his peculiar makeup encounters. When a transitory delirious content cannot be obtained, the daily conscious conflicts themselves may be used for analysis as a basis for analytic talks and for a reeducation therapy.

From the clinical material we have already studied it is fairly obvious that the mental content in epilepsy proves that the epileptic regresses from the displeasurable difficulties of life and in the first stages of the fit, the stress alone may be uncovered; whenever the patient reaches a deeper unconscious state, he gains the level of an easily recognized sexual striving. The unconscious wish, too, has different formulations; in the deepest striving he is indulging in the extremes of infantile pleasures, and finally actually obliterates reality. The basic idea in such studies is to determine the defective makeup and its specific conflicts, to bring in the patient's mind a better insight into his malady, and thus cause him to see the sequence and consequence of his crude handling of his life.

The therapeutic advantage of obtaining a mental content in epileptics is comparable with that employed in analyzing persons who suffer from the benign psychoses, especially retarded depressions, who we know are very considerably aided in making a more stable recovery from the individual attacks. Such individuals are also fortified against possible recurrences of the psychotic episodes. Anyone following this therapeutic method should bear in mind that continued epilepsy from its very nature is a deteriorating disorder physically and mentally, and if it be allowed to progress it steadily lowers the capacity of the individual to make new and difficult adaptations, hence any principle of treatment

which is based upon widening the plan of living is in itself bound to be very stressful. At first one cannot put this extra strain upon the epileptic without entailing more attacks than before. Frequently the plan of analysis given here must be undertaken for short periods only (days or weeks), and then the patient should be allowed to rest in his newly acquired position until he thoroughly accustoms himself to it, when more advanced work may be again undertaken. If the same content in the automatic state repeatedly returns, one must conclude that the special conflict about which the desire in the content groups itself is so basic that mere analysis will not set it free. Then a practical system for eliminating this defect must be instituted. Sooner or later one finds that simple analytical talks are the supplemental guides to more definite methods of training out the personality defect. The susceptibility to meet this reeducation will give a just estimate of the prognosis in the individual case. The mere cessation of attacks, especially under sedatives, without corresponding improvement in the psychological tests, is an indication that the underlying deteriorating disorder has not as yet been favorably modified and that the epilepsy may in course of time be expected to break out again after a temporary arrest.

To sum up, one may say that a psychological study of the mental content in epileptics, both conscious and unconscious, demonstrates: (1) The depth of unconscious regression; (2) the special types of conflict which the epileptic has and the way he tries to solve them; (3) the specific type of primary defect in his endowment. Its therapeutic value in addition is (4) to furnish a specific point of analytical attack by simple explanatory talks; and (5) to show more definitely the type of special education which should be adopted for each individual patient. [Author's abstract.]

Di Gaspero, H. WHITE BLOOD CELLS AND EPILEPTIC SYMPTOM COMPLEX. [Archiv. f. Psych., 1919, Vol. 59, p. 118.]

In the symptom complex of "genuine" epilepsy, the behavior of the white blood cells is subject to great variations in different phases of the disease, both in regard to the total number of cells and to their composition. There is nearly always an increase of the monocytes and lymphocytes (large and small), the increase of the latter coinciding pretty regularly with the onset of the paroxysms. The polymorphonuclear neutrophile leucocytes are the most labile element and the blood formula is essentially determined by the variations in their value. While the number of the basophile leucocytes (mast cells) are subject to only unimportant variations, the behavior of the eosinophile elements are characteristic. In regard to the total number of the white blood cells, there is very often diminution in the number of these corpuscles during the attack. This decrease in the number of white cells, especially of the neutrophiles, with corresponding increase of the lymphocytes (even to the extent of absolute lymphocytosis) may very often be interpreted

as a premonitory sign of an attack. Where the leucocyte conditions are nearly normal there is usually freedom from acute psychopathic disturbances and a subjective feeling of health. After the attack there is very often an increase of these elements up to a general leucocytosis of varying duration, though usually the normal conditions are restored after a short period. The eosinophile elements seem to be diminished with noteworthy regularity before the paroxysmal attacks. The lowest values being found during the paroxysms, with an increase to above normal immediately after the attack. The results obtained during the acute psychopathological symptom complex which, to a certain extent, replaces the spasms, were similar to those obtained during the typical paroxysms. Here, too, the blood symptoms permitted prognostic conclusions. The behavior of the white blood cells in the epileptic symptom complex shows noteworthy analogies with the specific blood picture during the anaphylactic traumatic process in the parenteral decomposition of albumin. The so-called "genuine" epilepsy may, in the author's opinion, be explained from the viewpoint of an intoxication from decomposition of albumin, and as essentially founded on such a basis. [J.]

Tramer, M. PATHOLOGICAL ANATOMY IN EPILEPSY. [Schweizer Archiv. f. Neur. u. Psych., 1918, Vol. 2, p. 202.]

The author found no changes of the central nervous system which could be considered pathognomic for epilepsy, although there seemed to be a parallelism between certain anatomical changes and the severity of the clinical pictures. These anatomical changes were more particularly in the form of a degeneration of Betz's cells and a gliosis of the subpial margins. Defects of development in the ganglion cells and neuroglia were evidence of the important etiological rôle played by the congenital weakness in the brain of epileptics, and the writer was able to distinguish certain groups in which the various individual cases presented resemblances anatomically, or both anatomically and clinically. Among these groups was the so-called "spastic epilepsy," in which, on the anatomical side there were specially pronounced injuries of Betz's cells and on the clinical a particularly unfavorable prognosis. The problem of the etiology, however, probably lies beyond these changes in the vessels, neuroglia and cells, involving dynamic factors. It is therefore a problem in which energies have to be taken into consideration, and to discover their nature psychological or physicochemical methods are needed which are not at the disposal of neurologists. While microscopic methods reveal chemical factors, they work with dead substances and dynamic energies are properties of living tissue. [J.]

Siebert, H. ON EPILEPSY. [D. Ztschr. f. Nervhkl., 1918, Vol. 60, p. 260.]

The writer gives a loosely correlated series of observations on epilepsy after scarlet fever and encephalitis in the fourteenth year; the

great rarity of purely traumatic epilepsy, the disappearance of epileptic attacks of long duration at the onset of a luetic cerebral affection, or a progressive paralysis, the rarity of an epilepsy of luetic etiology, a case of epilepsy apparently caused by multiple sclerosis (a rare occurrence and in this case possible produced by repeated attacks of acute cerebral swelling). Finally the writer expresses his views against the use of subcutaneous injections of cocaine to distinguish between hysteria and epilepsy. [J.]

Gressmann, Kurt. STATUS EPILEPTICUS. [Arch. f. Psych., Vol. 59, p. 37, 1918.]

Status epilepticus is the most serious condition that menaces epileptics. Twelve cases are described by the author. Symptomatically he distinguishes between the stage of repeated attacks and the final stage of deep stupor. The latter may last from a few hours to several days. This condition must be differentiated in the diagnosis from hysterical attacks, paralysis, eclampsia, uremia, diabetic coma and from intoxications, in which similar symptoms may be manifested. As to the etiology—the status epilepticus may make its appearance both in individuals who have suffered for years from epileptic fits and in those who have never showed any epileptoid signs. Some injury may determine the onset, misuse of alcohol, exposure to the sun, sexual excesses, etc., and symptomatic epilepsy is also met with as result of brain tumors, cysts, or hemorrhages. Prognosis is serious. The pathological anatomy of epilepsy is still obscure, there being no finding indicating the nature of the changes in the central nervous system which are at the foundation of the disease. Prophylaxis is the only means fitted to combat the disease, *i.e.*, regular habits of mind and body and avoidance of everything which could disturb the unstable mental equilibrium. Though therapy has little influence on a disease of this character, the author suggests that in cases where the epilepsy is a sign of a tumor, etc., trepanation may be resorted to, and, where there is gravity, induced abortion. Treatment with hydrated chloral and isopral was undertaken by the author with the result that the latter seemed to produce more beneficial results than the former. [J.]

Hartenberg, P. NEW CONCEPTION OF EPILEPSY. [Medical Press and Circular, March 10, 1920.]

This author here presents, in translation, a general epitome of some of his views. Epilepsy is not in reality a convulsive disease. It is a phenomenon of inhibition, not of excitation. It is a psychic more than a motor disorder; unconsciousness, not spasm; coma, not convulsions, is its essence. In his concept great importance is attached to the preliminary arrest of psychic functions, the loss of consciousness, amnesia, loss of equilibrium, etc., which are indicative, not of imitation, but of inhibition. They invariably precede the motor phenomenon. Epileptic

disturbances may arise without any convulsive display, for instance, petit mal and inhibitory episode is often the first indication of the evolution of the disease. Conversely, convulsions may arise not only in epilepsy, but in almost any condition which arrests the activity of the higher cerebral centers, such as asphyxia, poisoning and anemia. In such cases it would appear that the motor phenomena have their origin, not in the cerebral cortex, but in subcortical, bulbar and spinal centers. The prime necessity for the convulsive discharges is that the inhibition be brusque and deep; this is precisely to be found in epilepsy. Further, in epileptics, there is no indication of habitual cerebral stimulation nor of increased muscular tonus. Finally, the hypothesis of inhibition explains the preponderance of nocturnal paroxysms, sleep being in itself a comparative arrest of cortical function.

Tracey, E. A. FRIGHT AS CAUSE OF EPILEPSY. [Endocrinology, April-June, 1920.]

The author here reiterates an old belief that severe fright can produce idiopathic epileptic attacks. It acts, he assumes, by causing a hypertonia of the sympathetic divisions of the vegetative nervous system. Such a sympathicotonia was evident in a case reported.

Knapp, Albert. EPILEPSY AND THE KORSAKOW SYMPTOM COMPLEX. [Monatsschr. f. Psychiat. u. Neurol., 1918, Vol. 44, p. 74.]

The author published two cases of Korsakow's symptom complex occurring in epilepsy, no cases of this sort having hitherto been described. The first case is that of a merchant, 30 years old, who had suffered from epileptic convulsions ever since his 16th year. From his 25th year he had shown marked mental deterioration. A mental attack observed by the author ran its course in the form of the Korsakow symptom complex, with motor retardation, disorientation for time and place, retrograde amnesia and confabulation. The disturbance lasted eight days. The second case was that of a man 37 years old, who, after an attack of typhus, developed epileptic convulsions, on account of which he was released from military service. During the entire time that the patient was in the clinic where the author observed him, from January 8 to February 13, he manifested the typical symptoms of Korsakow's complex. These two cases present many points of resemblance, namely, both were without stigmata of degeneration; the mental faculties deteriorated in the course of a few years; both had attacks of excitement and rage, at first postconvulsive, later independent attacks; both had speech defects, one of articulation, the other confusion of syllables and letters; and in both the Korsakow symptoms continued for a period after the convulsions had subsided. The author calls attention to several features in which these cases differed from the polyneuritic and presbyophrenic psychoses, *i.e.*, the absence of suggestibility in the confabulation and the preservation of retention with difficulty of apprehension. In these two

cases the confabulation plays an independent, or active rôle, so to speak, and could not, as in ordinary cases of the Korsakow complex, be diverted into different channels by questions. As for retention it is well known that this faculty is preserved in epileptics even when the mental deterioration has advanced to a considerable degree. While the full amnesic complex has not been hitherto recognized in connection with epilepsy, isolated examples of amnesia have frequently been described. [J.]

Oppenheim, H. EPILEPSY AND BORDERING CONDITIONS. [Ztsch. f. d. ges. Neurol. u. Psychiat., 1918, Vol. 42, p. 353.]

The author defines his view of an intermediary field between hysteria and epilepsy, in which the "affect epilepsy" of Bratz belongs. The patients of this class are epileptics and they all belong in the group of neurasthenics and psychasthenics. Evidences of this view are the facts that the symptoms in these cases scarcely ever arise spontaneously, but are set in activity by some exogenous cause. For example, ordinary excitements and exertions up to a certain time produce only simple anxiety states or congestions in the patients, but suddenly when there is an increase of these harmful circumstances, or a more frequent repetition of them, convulsions are the result. These convulsions are only an episode in the course of the affection and a patient may be seized with them only once or twice in his entire life. Even when the attacks are frequent, the intelligence and memory do not suffer. The attacks themselves may differ from epileptic convulsions. Finally, the disease is amenable to therapeutic treatment, but yields less readily to bromide than to measures directed against the general neuropathic diathesis. The author gives further precision to his view of the boundaries of epilepsy by differentiating this disease from Friedmann's disease or what was later called "pyknolepsy," the peculiar characteristics of which are that it occurs in children, that the convulsions are frequent and of short duration (sometimes 100 in a day), that there is not complete loss of consciousness, nor rigidity of pupils and that the disturbances arise on the foundation of a neuropathic diathesis. Further he differentiates epilepsy from narcolepsy which with its allied gelasmus he considers as independent neurosis to be distinguished from both epilepsy and pyknolepsy. In the author's opinion narcolepsy could be explained by assuming a central point in the mesocephalon from which the entire musculature of the body could be "hypnotized" and controlled. This point would stand in immediate relation with the hypothetical sleep center as well as with the central ganglia which control the mental emotions, especially that causing laughter. An extreme irritability of the sleep center and the central point for relaxing the muscles would render all the phenomena clear, but, as the author concedes, there is no proof of such localizations in the brain. The author describes a series of observations of epilepsy and allied affections in illustration of his views: four cases resembling Friedmann's disease; two cases of cortical epilepsy, namely, one of

unilateral convulsions which first suggested a circumscribed focus in the brain, but which the author decided were of psychogenic origin, a second case which occurred after fright on the foundation of a weakness in the cortical region which the author believes conditioned a peculiar irritability in a circumscribed area; further a case is given which the author decides was genuine epilepsy, though the attacks assumed the form of Jacksonian convulsions. Other observations described are reflex epilepsies, epileptoid convulsions in psychopaths, a case of alternation of tic general and convulsions. [J.]

Book Reviews

William Wundt. ELEMENTS OF FOLK PSYCHOLOGY. OUTLINES OF PSYCHOLOGICAL HISTORY OF THE DEVELOPMENT OF MANKIND. Authorized translation by **Edward Leroy Shaub**, Professor of Philosophy in Northwestern University. New York, The Macmillan Company. P. 523.

A work as inclusive as this one would naturally bring much comment and more criticism. Anthropologists who assert that the only correct method of approach is the historical will condemn the methods by which Wundt arrives at his conclusions. Others of the same school will scorn this book because it arrives at any conclusions, for they insist that cause, purpose and conclusions are out of bounds in any sane, well-regulated book on the subject of anthropology. They state that followers of their cult must not question the reason, object or interrelationship of any given phenomena in the events of history, but that one must be content to register, tabulate and record the doings of man in sequential fashion, neat handwriting preferred. Then we find another group of thinkers who criticize Wundt's conclusions. They little heed the manner of his presentation. To this group more attention may be given in justice, for they, like Wundt, are interested in the reason why and how things came to be as they did come to be and not in some other fashion. They go a step farther than Wundt and state that there was an underlying purpose for all the acts of man, and that things did not happen by chance. In this group we find, roughly, the creative evolutionists and those who recognize the workings of the unconscious.

One of Wundt's most serious critics is Freud. In his book (*Totem and Taboo*) he devotes much time and space to a criticism of Wundt's final conclusions regarding the origin of totemism and the origin of exogamy. Wundt states that the fear of demons, the development and evolution of totemism and many of its incidental psychological phases of development were the result of chance and circumstance. Freud shows that there was a profound psychological purpose underlying all of these stages of development.

Throughout his book Wundt stresses the theory that symbolism was the result of accidental circumstance. An example of this is his theory of the development of primitive art. He states that man, due to the pleasure principle derived from rhythmical actions, drew symmetrical figures, triangles for example. Then primitive man repeated the process and made several triangles and used these for decorative purposes. Wundt goes on to say that the comb was one of the first articles of female adornment among primitive peoples. The triangles which by this time had pleased primitive man's eye, now grown aesthetic, were designed on the women's combs. Later, primitive

man, with the aid of his cultured eye, noticed the resemblance between the triangles which he had made and the aprons which the women wore. Thus the symbol came into being! Not before. It would be as fitting to say that man had perfected a language and suddenly discovered that it could be used to communicate ideas. Let us now attempt to reconstruct this case, which Wundt cites with such clarity, in the light of purposeful psychology. Let us admit that in the first place the triangular aprons, in addition to having an initial symbolic value, as a token of fertility, covered another hirsute triangle. Let us admit that this original triangle shielded from the eye of man, primitive man, held a strange fascination, inherited to this day by his more cultured descendants. Perhaps the more skeptical will find this point proved if they consider carefully the necessity for this sequence by a contemplation of the oft-repeated process, resulting from this fascination, which resulted in their own production. What would be more appropriate than to displace this triangle from the genital region to the equally hirsute head region in a simple yet highly symbolic manner? Today we find it in dreams. Why not in the reality of yesterday? It might be added in discussing this point, that while we admit that art had its inception in the symmetry and rhythm as stated by Wundt, here we find evidence that man's earliest aesthetic stimulus was a sublimation of the more powerful sexual urge which is so thoroughly founded on rhythm.

Pragmatic psychologists will find much that is useful in Wundt. His examples of what is now known as ambivalence are frequently repeated. He gives examples in philology where the same word was used to connote large and small—the inflection of the voice serving to distinguish one from the other. As an example of primitive emotional ambivalence we can take the medicine man who was feared and yet looked upon as a helper. This may be considered analogous to the position of the father, later the hero and finally the god. Symbolically we find ambivalence in reference to the totemic animals the eating of which was taboo, and yet on ceremonial days the flesh was eaten as a ritual.

Exception might be taken to the motives behind the fear of the dead by primitive man and the loss of this emotional reaction when warfare came into being among the more highly civilized. Granted that among the primitive death by violence was the exception, the conclusion would be that some disease was responsible. In many instances we should be allowed to presume the disease was one of a highly contagious character. Experience taught that contact with the dead led to contamination and further spread of the disease. Naturally the primitive mind would attribute this unseen yet highly potent phenomenon to demons and lead to the avoidance of the touching of the dead. Hence the taboo not alone of the dead, but of those who had come in contact with the dead. The belief advanced that the breath was the carrier of the soul is logical. Later, when man in the course of his civilization learned the art of killing in battle, he discovered that contact with the once healthy warriors who had died did not lead to the same disaster as contact with those who had died

through the vagaries of nature, and he ceased to fear contact; in fact, he used to bring his opponent's head home as a trophy. Here, again, we are shown an example of emotional ambivalence. The slain warrior was asked to forgive his murderer. Quite natural, too, that he should decide that the soul resided in the blood now, for with the gushing blood of the wounded life departed. A faulty biological concept is advanced when Wundt, in speaking of the blood as the carrier of the soul, states that the blood has no relation to inheritance. The complement fixation test does not bear out this plausible if erroneous idea.

In many ways this work of Wundt's is most praiseworthy. He refutes with clarity the presumptions of the anthropologists who try to advance theories of degeneration in regard to many of the customs of man. He postulates the more wholesome theories of constructive evolutionary development. The more primitive forms are placed in the order of their development and so a progressive program is presented. The order of presentation being primitive culture, totemism, the age of heroes and finally the age of gods.

Noteworthy in this book is the credit given to the comparative anthropology of Frazer, and in many instances the methods of Frazer are followed. Andrew Lang and Spencer also receive just praise. The book is written in a masterly fashion with great lucidity and charm. It serves as a goodly background to workers in anthropology, history and psychology. It furnishes much information and at the same time moves along unfolding chapter after chapter in the life history of man. It attempts to unfold this history back to the days of earliest antiquity and to spread apart the heavy curtain of the future.

Generous praise should be given to the painstaking work of Edward Leroy Shaub, who has presented this excellent English translation.

STRAGNELL.

Thomas, André. LE RÉFLEXE PILO-MOTEUR. Masson et Cie., Paris.

This most interesting and fascinating monograph, the first published work of the Fondation Dejerine, comes to us as a complete clinical-anatomical study of the sympathetic nervous system, particularly as it is related to the pilomotor, sweat and vasomotor mechanisms.

The opening chapters discuss the previously known anatomy and physiology of the sympathetic nervous system, in which the work of English physiologists is more or less closely adhered to. This is followed by methods of examination showing that the reflexes in question may be invoked by mechanical, thermal or electrical stimuli. It is usually hemilateral, monosegmental or universal. Certain areas are particularly sensitive, such as the neck and shoulders and the lower part of the axilla. Extensor side reactions are more readily provoked than flexor.

In Chapters III and IV the reactions following lesion of the cord are described. Here Thomas describes the reaction above as "en-

cephalic," since the upper cortical pathways are not interrupted, and the reflex below as "spinal." In general the pilomotor, sweat, vasomotor and thermal responses behave alike. Edema and pigmentations of the skin seem to follow similar laws.

In complete section, so far as the sensori-motor systems are concerned, Thomas's findings agree fairly well with those of Lhermitte and Head and Riddoch. A somewhat analogous type of complete establishment of the vegetative reflexes is observed by Thomas, so that the "shock" stage and the "mass reflex" stage of sensori-motor pathology have their more or less close parallels in the vegetative arc reflexes. Thus the pilomotor, sweat and vasomotor responses mount in intensity with the intensity of the defense reactions and the bladder and rectal automatic reestablishment.

One can not enter into the details of the author's findings, some of which have been reported in the French literature. One must read this interesting work containing as it does further observations on the sympathetic reflexes here noted in a number of other lesions of the nervous system. The work is full of practical as well as of more technical data. A most interesting discussion relative to the utilization of the sympathetic reflexes in conjunction with the known sensori-motor findings in the localization of segments involved in spinal-cord lesions may be singled out as especially valuable. There are a number of others which lack of space does not permit mentioning. This can all be said, however, in the final summing up of the monograph, as one of the best pieces of neurological work that has appeared in recent years.

Pönitz, Karl. DIE KLINISCHE NEUORIENTIERUNG ZUM HYSTERIE-PROBLEM UNTER DEM EINFLUSSE DER KRIEGSERFAHRUNGEN. Julius Springer, Berlin. 28 marks.

The author first rather hastily and summarily discusses the general trend of the influence of the war experience upon recent formulations of the hysteria problem. From this there emerges more distinctly the *wish* element in the formation of this group of disturbances.

The patient is or was interested in his sickness. His wish and his will to be ill are an important element in its causation. This is not, however, necessarily a conscious process. Bearing on this generalization he quotes a number of experiences with prisoners of war. Here the severe shock neuroses seem to be almost entirely absent. His own nine months' observation of over 80,000 prisoners of war failed to reveal a single case of abasia, astasia, mutism, tremor or hysterical cramp state. Severe wounds that relieve the soldier of further participation in war activities seem to have a similar result so far as hysterical features are concerned.

From this the author enters into a timid discussion of the Freudian concept of the "unconscious flight" into a neurosis. This is about as far as he gets, however, and leaves the matter just about where the psychoanalytic formulations begin.

The war apparently has not taught the author very much, or if it has, he has not dared to tell it, since in professional preferment it is so important not to advance too rapidly to impinge upon the orthodoxies of those in positions of power to grant favors.

Fortuyn, A. B. Droogleever. VERGLEICHENDE ANATOMIE DES NERVENSYSTEMS. Erster Theil. De Ewen F. Bohn, Haarlem.

This first section of a Comparative Anatomy of the Nervous System, projected as a complete exposition of the subject by Dr. Ariëns Kappers, of Amsterdam, takes up the nerve pathways in the nervous system of invertebrates. Fortuyn is professor of histology in the University of Leyden, and in response to the suggestion of Kappers, who has had in preparation a comparative anatomy of the nervous system of vertebrates, the second volume of this series, he has prepared this sketch of the nervous system of invertebrates.

He has confined his descriptions to a general view of the connector systems in the different invertebrate groups, since any résumé of the external forms or the details of cellular structures would be too colossal a task for a single book. As it is the work is quite imposing, a large octavo of circa 400 pages.

The general scheme of the enterprise is to trace the pathways whereby the stimuli received from the external world are brought into an organized system to effectually control the behavior of the organism. This general physiological and dynamic attitude is manifest throughout the work and the arrangements of the conduction pathways worked out along physiological-value lines.

Many difficult problems of homology are constantly coming up and the great variations in types found in invertebrates, in comparison with more fixed modes in higher types, constitutes an ever-changing series of perplexing histological questions. These the author has dealt with in a catholic spirit.

No review can be adequate, even to offer a glimpse of the wealth of comparative material that this work offers. It will constitute a standard mine of information for all students of morphological and physiological problems connected with the coordinations of animal life and behavior. It is amply, adequately and beautifully illustrated; an exceedingly full and carefully selected bibliography of the work on the nervous system; every group of animals studied from the Poriferae to Amphioxus is given; and, in a word, we know of no single work in the entire realm of comparative histology of the nervous system which can be compared with it. It is unique and indispensable.

Obituary

ALFRED SÄNGER

The death of Dr. Alfred Säger in May, 1921, removed not only a definite worker from the field of neurology, but a friend of those for whom and with whom he worked. He was still in the prime of an active life, for he was born in May, 1860, and he held the office of Professor at the University of Hamburg and Chief of the Neurological Division of the General Hospital of St. Georg. He enjoyed also a large practice which had grown up through the years past.

He was the son of Dr.phil. Max Säger and at an early age he had come to Hamburg. Here after concluding his studies he became assistant at St. Georg at the age of twenty-five and also served as assistant at Eppendorf. Five years later he entered upon his neurological service both in its extension in his private practice and in the service in the polyclinic at St. Georg. His chief contributions to neurology in the field of research are in the neurology of the eye. He worked in this field with Wilbrand in the eye section of the clinic and he also published with him a series of large works upon this subject. The two authors also published in 1918 a book upon injuries to the visual tracts of the brain with special reference to war injuries, which they had special opportunity to study.

They were able to present a number of new theories, as for example the frequency of central homonymous hemianopic and double-sided central scotomata, in wounds in the neighborhood of the protuberantia occipitalis externa or the absence of lasting cerebral blindness and of lasting psychic blindness after gunshot wounds in the occipital region. A number of other neurological problems have also been the subject of Säger's investigation, brain tumors, hypophyscal and dysthyroid disorders, eunuchoidism, cystercian epilepsy, serological problems and others.

His interest however never became bound to the laboratory. He was first and foremost a man of genuine appreciation of the human problems involved. Research questions were always united in his interest with clinical facts and with the clinical application which

made them problems of men and women. A personal friendly interest in his patients was uppermost. He early became a champion of the patient in the matter of nervous injuries due to accident in the industrial world. His interest extended itself to wider problems of forensic psychiatry in which his individualistic attitude was not always in agreement with the fixed conceptions of the law. He had a particularly sympathetic understanding for the inferior or borderland cases, especially for the youthful delinquent.

His kindly human interest, enriched as it was by a genuine culture and not untouched by a gentle humor, showed itself in all his relationships. It marked his attitude toward his colleagues, it made him always ready to assist young workers, even to retire himself into the background when this gave opportunity to some one else to bring his work forward. Dr. Sanger was known in his native land and other European countries through personally delivered addresses.

SMITH ELY JELLIFFE.

GEORGE HENRY SAVAGE

The death of Sir George Savage on July 5th, 1921, brings a sense of loss in the field of psychiatry where he had served a long useful term. It furthermore removes a striking personality whose vigorous human interest in a wide range of activities was never diminished. Not alone his close professional associates and his personal friends felt to the full the force of this personality. It impressed itself also upon the many students from this side of the water as well as his own who counted it a privilege to place themselves under his instruction.

His greatness as a psychiatrist lay in his strenuous activity, his never waning interest in all that pertained to the subject of psychiatry, his wide information in regard to its advances and his predominating emphasis upon its clinical side which to him meant the human side. As early as 1886 he laid stress upon such an attitude toward mental disorder in an address which he made as president of the Medico-Psychological Association. He was keenly interested in the work with mental defectives and was a member of the board of management of the Royal Earlwood Institution for such.

Sir George Savage was born in 1842 and was educated at his native town Brighton at the Sussex County Hospital and Guy's Hospital. He passed from one degree to another receiving his M.B. in 1865 of the University of London and graduating as M.D. in

1867. He received the M.R.C.P., London, in 1878 and was elected to the Fellowship in 1885. He was connected with Bethlem Hospital for seventeen years, in the latter ten years as physician-superintendent. He lectured also during this time at Guy's Hospital and taught in connection with his work in Bethlem. He was a member of many medical societies in some of which he held office. He filled the office of president of the Medico-Psychological Association, the Neurological Society, of the Section of Psychology at the Annual Meeting of the British Medical Association in Belfast in 1884 and of the Section of Psychiatry of the Royal Society of Medicine in 1912. He was knighted in this same year. He filled the office of Lumleian lecturer at the College of Physicians of London and that of Harveian orator. He edited the "Journal of Mental Science" during the earlier years of his activity in association with Dr. D. Hack Tuke. He is the author of a well known textbook "Insanity and Allied Neuroses" and of a large number of papers, some of which have been published in American journals.

His long and active service full of interest in the work of his colleagues as well as in his own yet left him ready for every social activity as well as for such diversions as gardening and mountain climbing. He gave hearty attention also to interests of a more serious sort in the progress of the world. Woman's medical education enlisted his cordial support. This he gave in a material way as well as through his sympathy. His presence could always be counted upon at the annual opening ceremony of the London School of Medicine for Women where he could see the ideals for which he had worked being put into effect. A man of much extended activity and of sympathy in so many directions leaves a strong impress upon the sphere in which he has worked. For this reason his loss will be felt by many.

SMITH ELY JELLIFFE.

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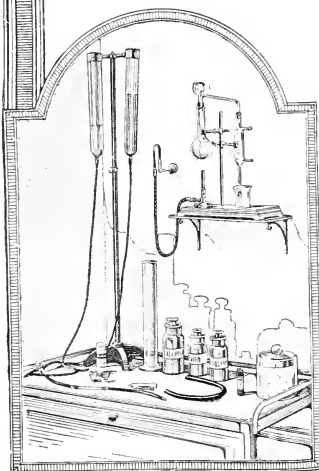
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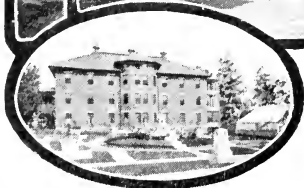
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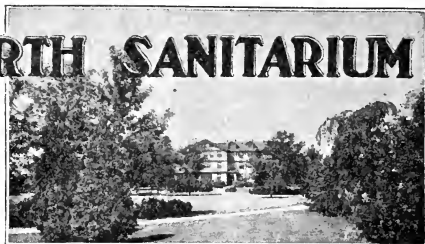
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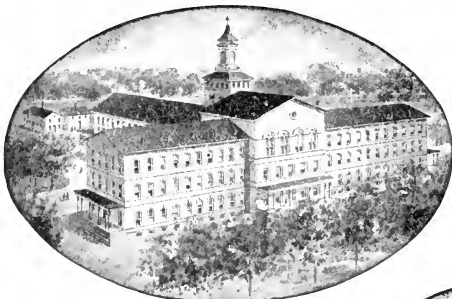
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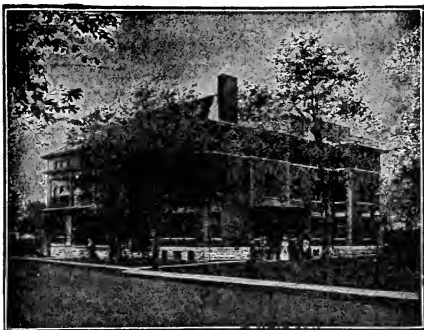


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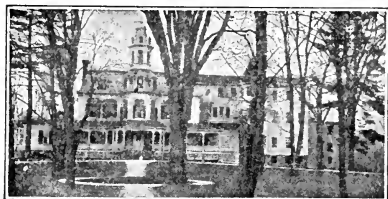
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