

attempting to translate from one system to the other; but by adopting the method just described, there can be very little danger from that side.

PROF. JOS. P. REMINGTON, Philadelphia—With regard to the remark just made about teaching the metric system in pharmaceutical schools, in the College of Pharmacy of Philadelphia, the metric system is used almost exclusively. In the laboratory work no other is used. One point raised in the paper was the question of competency of the pharmacist and his liability to error; every educated pharmacist throughout the country would fill the prescriptions in the metric system just as well as by the old method. In 1890, the United States Pharmacopeia introduced in its liquid formulæ the metric system, so that the use of this system is extending. The great difficulty is in getting physicians to abandon the old and take up the new. In Germany, the matter was regulated by law and physicians were given one year in which to learn the metric system, and were obliged to use it thereafter; but we can not adopt such summary methods in this country.

DR. FRANK WOODBURY, Philadelphia, said that he thought that the decimal point and the ciphers repelled many physicians, and the adoption of the plan of writing quantities in grams, centigrams and milligrams in whole numbers, without the use of the decimal point, might greatly assist the transition from the old to the new and reduce the liability to error.

DR. J. N. UPSHUR, Richmond, Va., wished to say very emphatically that what Dr. Wheatley said about the indolence of old doctors is true; in this connection, he was much impressed with the truth of the saying that you can not teach an old dog new tricks. Speaking for himself, he did not believe that he could learn that metric system, and carry it into effect in writing his prescriptions, without killing somebody. At the same time he urges his students to learn the metric system. His son, who uses it in the U. S. Marine-Hospital Service, complains of the unprogressiveness of the druggists in his locality, which compel him to write his prescriptions for his private patients in the old system.

DR. F. G. WHEATLEY, in closing, said that the point raised that the writing of ciphers constituted an objection was not very practical. His own method is to only keep two denominations in mind, the grams and the centigrams, just as we have dollars and cents. Notwithstanding what had just been said, he thinks that it is the physicians who are at fault in this matter. The druggists who have graduated during recent years say that when they graduated they knew nothing about any other system than the metric, but they had to learn the old method on account of the prescriptions received. The fault lies with the teachers in the medical colleges. As long as the text-books teach both systems, the average physician will learn the old and leave the new.

EVOLUTIONAL AND INVOLUTIONAL TYPES OF MENTAL AND NERVOUS DISEASE.*

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The different epochs of life are factors of great moment both in the production and in the exacerbation of nervous instability. They are rarely passed through, even in the most healthy individual, without some psychical or physical manifestation. Each crisis in life determines new impulses, new thought, and new actions, which give each epoch a distinct physiology and psychology. We purpose to discuss in this paper the effect these periods have upon the brain and nervous constitution, considering chiefly the minor and transient disorders influenced or excited by them, and to attempt to explain the preventive measures necessary and advis-

able, possible and ideal, which may determine their development. The territory that we especially wish to cover shades insensibly into the two extremes, mental soundness and mental disease. This borderland is especially important on account of the fact that the psychoses as a rule gradually pass through a prodromic stage of nervous instability or one of recedent psychical action instead of being ushered in or terminated abruptly. Such conditions are psychopathic, but can not be grouped under the psychoses *sensu strictiori*. There is no disease which does not alter the mental state of the patient, nor is there any one whose physical state is not influenced by his mental condition. We desire to emphasize this point, as it illustrates a common law of cause and effect present in many disorders. The brain then controls the body just as much as physical states influence the mental. Each successive epoch adds a new burden upon the nervous system, and in unstable individuals it is only a question of time until the inherited instability reveals itself. The types of each period differ according to the intensity and rapidity of incidence and the physical manifestations. Nevertheless the disturbances do not include any disorder which can not be caused by other factors also. As an etiologic classification, however, we are justified in grouping them in this manner.

In childhood inherited strain is rarely noticed. At this period there is great difficulty in determining what is physiologic and what is psychologic. For instance, every experienced mother knows that a child does not always reveal a tired condition by a desire to sleep and a feeling of listlessness, but often by excitability and restlessness. When irritability and peevishness is observed as a result of physical exhaustion, we must regard it as evidence of the influence of physical states upon mental conditions, though it is natural and not pathologic. When threats of whipping, etc., are added to this, we find an artificially produced nervous instability with conditions of anxiety predominating, expressed by night terrors, loss of appetite, restlessness, etc.

Mental exhaustion may, however, without any such stimulus as whipping, terminate in diseased over-exhaustion. Here also irritability is the chief sign, but it is more marked than in the common evening exhaustion or is accompanied by other phenomena, particularly if a nervous taint is inherited. The child becomes quarrelsome, envious and imperious, or is timid and anxious, awkward and easily moved to tears. It tires easily, but does not sleep readily, tosses around, emits a shrill cry in its sleep, or talks to itself and does not awake refreshed as do normal children. These symptoms are too often looked upon as being due to gastric disturbances, without any efforts being made to combat them, and are allowed to take their course. It is unmistakably a diseased type of exhaustion, expressed in a transient disturbance of physical and mental functions.

Another condition at this period, due to inherited strain, is morbid depression. Children of this type are always reserved and gloomy, precocious and hypersensitive. In some this condition only exists in the early morning for a short time after awakening. This transient depression or melancholy is the precursor of melancholia in the adult.

We have in childhood different dislikes identical with those in adults, but which are often mistakenly supposed to be natural in children.

A child who may have been bathed many times before without evincing any signs of fear, may suddenly

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become restless when immersed, crying and drawing up his legs, as if in pain. It may be due to many causes and always demands investigation. More easily recognized and more common is the fear of being alone. In some, of course, this is due to the mother or nurse spoiling the child, but in others it comes on suddenly without any such cause and may be indicative of some general nervous disorder. Fear of strangers is also not always physiologic. Every physician can probably recall some child formerly friendly to him who suddenly became fretful and cried at his approach, who steadily refused to allow him to touch it, and in time acted similarly to all except its mother, the latter being compelled to stay with it constantly until as suddenly as it came, the fear vanished.

The best known form of infantile fear is *pavor nocturnus*. As this is generally so pronounced as to be a true psychosis, it will only be lightly touched upon. The onset of the nervous storm in such children can generally be predicted. Such a child is paler than usual, more irritable, can not go to sleep unless its mother is with it, and awakes as soon as she attempts to leave. Close observation will reveal some muscular twitchings, which increase in intensity, until suddenly the outburst comes on, during which the child may even be in a condition of transient mania. Nightmare must, however, not be confused with these night terrors.

Transient exaltation of spirits is common in children. Anticipation of the slightest pleasure will make its eyes sparkle, make it become restless and babble incessantly, cause it to laugh unceasingly and act somewhat as does an adult under the influence of alcohol. Parents generally stand complacently observing it and do not seek to repress this unnatural excitation until suddenly the picture changes. The child becomes listless, cries, and upon being taken to bed tosses about, and after it has gone to sleep, awakes frequently with a cry of anxiety.

A child who has inherited a neurotic constitution is generally below the normal weight and is apt to be precocious. Even the laity is apt to be suspicious of a too bright mind in a frail body. It may be due to malnutrition, rachitis, etc., or to the fact that the parents are small in stature and that the psychic life has simply been developed too early. But most often a neurotic taint is back of it.

Single nervous symptoms observed at this period are senseless laughter, a staring look, twitchings of the facial muscles, spasms, both local and general, stammering and stuttering, and strabismus. These symptoms may occur particularly during teething. A healthy child generally teethes without trouble. But when the nervous resistance is congenitally weak, the physical strain makes excessive demands upon the nervous system whose instability then manifests itself. Such children reveal their "nervousness" in other ways. Their facial color may rapidly change from bloom to pallor, they vomit easily, cry in their sleep, are domineering, early learn to comprehend spoken language and have pronounced retentive powers. Such symptoms reveal a nervous temperament. When in addition we find stubbornness, viciousness and perverse habits, as instinctive masturbation, it reveals an inherited taint in addition to a nervous temperament. When we also find the so-called stigmata of degeneration, we are dealing with a case of congenital degeneration. No single symptom, however, proves anything; it is only by a combination of symptoms that we can determine such conditions. As the child grows older, other neurotic manifestations

may come on. These include a marked and unexplainable anemia, nervous snuffling, peculiar stubborn headaches and slight variations of character, mentation and habits occurring periodically.

The older the child is the more diverse are the conditions found, environmental influences being added to the autochthonous. This is the period of life when hypochondriac ideas, excessive desire for order and cleanliness and even religious exaltation first become evident.

The earlier the signs of nervous disturbance occur, the more frequent and pronounced they are, the more probable is the belief that they are due to congenital degeneration. It is natural, therefore, to find the hereditary ataxias and muscular atrophies, Thompson's disease (toxemic?) at this period of life.

The next period of life, the school or prepubescent age, is very similar, except that the physiologic and pathologic states are more difficult to separate. Emotion is no longer supreme, the muscular system now asserts itself, and the faculty of judgment and cognition comes into play. Children at this age are able to facilitate as well as to hinder the development of their faculties, and parents may consciously or unconsciously inculcate bad habits in their children by example or by improper methods of training and discipline. Chorea, "insanity of the muscles," is the type of motor disturbance and is found at this age; also petit mal, unconscious automatism or somnambulism, and migraine. The brain is now rapidly developing and the cortex is asserting itself. Muscular impulses dominate the scene and hence the nervous disorders are largely muscular.

The signs of degeneration noticed are flat-pointed teeth, hacking cough, a capricious appetite, and a scanty urine. The objective signs are slowness in movement, stooping, and twitching. We can at this age already observe a tendency to neurasthenia or hysteria, one child having hysteric tendencies, another neurasthenic.

In this period the influence of school-life is the most important factor. Incomplete development, undue sensitiveness, excessive restlessness, the frequent and perplexing changes from one room and teacher to another with entirely different methods, the exactions demanded by educators in their senseless rivalry, the anxiety attendant upon competition for prizes, etc., have a harmful result upon the pupils. There are, of course, some advantages in our system. A timid child becomes accustomed to association with strangers, peculiarities are influenced and often repressed through the ridicule of classmates, improper home training is counteracted, the energy of a child is turned into a particular channel, an irregular life is made methodical, carelessness tends to replace carelessness, etc. But under our present system, where the mental capacity of all children is regarded as equal, and the mental energy is drained to the last drop, in accordance with the forcing process now in vogue, which uses up all reserve power and inhibits the growth of other parts of the brain and prevents the preparation of the body for the momentous crises of life which are yet to come, all the advantages are multiplied. "There is no time nor place of organic repentance provided by nature for some of the sins of the schoolmaster."

The next period of life embraces puberty and adolescence. We include these two epochs in one because they are so intimately associated, one being the termination of the other. Before this time boys and girls are much alike, they are not very different sexually, mentally, or physically; then they gradually develop sex-

ually, and finally mentally; the boy comes to use his judgment and reasoning powers more and more, and the girl becomes more impulsive and emotional. This is not an abrupt change, but is only accomplished after the lapse of some years. The emotions of a girl up to her 21st year are not stable or deep-seated and are soon forgotten; her conversation only then becomes coherent, her actions womanly. A boy becomes manly at about his 24th year, commences then to become precise and settled and deliberate.

Inasmuch as this is the period when the mind develops, it follows that inherited mental characteristics would now show themselves, perhaps for the first time, or more strongly than before. This is, then, the time when we expect hysteria and hemiparesis, epilepsy, innate immorality and arrested development, to show themselves. Clouston includes acne, ugliness, many forms of impaired vision, and perhaps phthisis and acute rheumatism as neuroses of this period, but why I do not see. Eccentricity and incompatibility of temper, sexual aversion and religious asceticism, decrease of volitional power, reveal themselves during this period. Many of the first convictions for crime are in those of the adolescent age.

Many diverse factors now come into play. The combat with the outer world begins in earnest; the ability for self-culture and self-responsibility increases; production replaces acquisition. The transition from childhood to this period in woman occurs with the interaction of certain periodical changes which strongly influence the mind. These may come on early or late. It is an unfavorable sign if they come on long after the development of the mind. The effects of an improper education, sexual desires, the emotional development with its alternate display of fear, hope, and disappointment, the indulgence in religious contemplation, the fostering of egotism and self-introspection, the exhaustion attendant upon the exacting duties of social life with its balls, theaters and parties, the daily tyrannizing of an overstrict and zealous father, with perhaps compulsory attendance at church and forced restraint in all daily actions, are the forces at work at this period. The onset of a hysteric attack can often be traced to the preparation for confirmation. In males this is the age when sexual abuse and alcoholism assert their sway and play havoc with the system. The strain of making up new functions is such a burden that it takes little more to upset the system.

The next period, that of adult life, including pregnancy, lactation and parturition in woman is a momentous one. This is a time of trial to a female, even though she is not congenitally predisposed to instability. Reproduction of the species, although it is the duty of women, is likewise a menace to her health. Pregnancy generally evokes mental depression, irresistible longings, irritability, foolish jealousy, anxiety, etc. Hysteric symptoms are also prone to occur at this time. Similar occurrences take place in childbirth and lactation. Chorea and hebephrenia are also common during this time. In the male, family cares, business worries; political, church and social duties; alcoholism and syphilis and business speculation combine to keep up a ceaseless cerebral congestion. Neurasthenia is for this reason the nervous disease of adult manhood. We may find also eccentricities of character, curious habits, recurrent attacks of depression or of forced gaiety, and in luetic individuals the syphilitic nervous diseases.

Suppression of the menses in females causes many nervous symptoms, particularly stupor, listlessness and

headache. Illicit intercourse generally produces pathologic mental changes in woman and if children are begotten the shame and distress often suffice to produce a transient mania.

With the cessation of the power for reproduction, vital energy is lessened. Unstable nervous systems are just as apt to be upset by the process of decadence as they were in their development. The body loses in weight, the circulation slows up, the lymphatic and arterial systems commence to degenerate, the emotions quiet down, the imaginative power disappears, the mental processes alter, etc. These changes do not take place quickly, but cover some years. In woman the disappearance of menses is not coincident with the climacteric. We may find in females at this period, super-sensitiveness, sleeplessness, depression of spirits, different phobias and general apathy, and in both sexes, various trophic disturbances. In men the climacteric is not as definite or as complete and occurs later and more gradually than in women. The mental alterations are therefore rarely as pronounced, irritability and a transient depression of spirits are all that is noticed. This is the time of life when cerebral hemorrhage and encephalomalacia are prone to occur.

Physiologic senility is not only slow and insidious in its onset, but has no set time for its occurrence. In general we may say that it commences when atheroma and arcus senilis comes on. Boy-Tessier well says that "the coefficient of the organic faculties varies for each individual. Each by reason of his lessened organic resistance carries from birth a certain predisposition to disease, that is to say, a special grouping of lessened organic resistance upon which depend the time of the appearance of senescence." All functions suffer except that of reproduction, which answers to laws of its own. The springy step, the elastic frame, the lustrous hair, the quick mind become things of the past. The process of thought, though still deliberate and accurate, becomes less rapid, and the association paths seem to become less responsive to the will. The organs become sluggish in action and more susceptible to disease; co-ordinated movements are more difficult; all thoughts, tastes, habits approach again those of youth.

Senility becomes abnormal, according to Clouston, if hereditary cerebral weakness exists, if the brain has been overtaxed, or if its blood-vessels become diseased. Motor impairment is characteristic of this period, revealing itself in paralysis agitans and similar disorders. The melancholia which is often observed is not a "conscious sensitive mental pain, but an automatic motor misery." In others again we find a transient mania due to sudden alterations of the cerebral circulation and to vasomotor paralysis.

Senile abnormalities are however, when not so pronounced as these three types, difficult to distinguish from the physiologic occurrences of senility, because the latter themselves consist in mental and motor changes which at other times of life would be considered abnormal. The senile speech so characteristic of this period, the loss of ideation and of affection, the lessened memory and concentration of thought which are found in physiologic senility, render it difficult to draw appropriate conclusions. But in general, when excessive volubility, desire for unfit marriages, peculiar perversities of temper, wandering tendencies and restlessness—the normal senile always desires rest—indifference, carelessness in habits and hypochondriacal ideas are found, we can regard senescence as having exceeded its physiologic limits.

DISCUSSION.

DR. GREGG, Hollins, Va.—I wish to express my own peculiar views in regard to what was said in connection with the evolution of nervous disease from its mental aspect. I have never believed in mental evolution. I can conceive of no evolution of mind, but only of organic evolution. I can conceive of nervous evolution. I can understand brain development; improvement of the various centers of the brain. I understand improvement in the intellectual centers of the brain, the psychic centers; but I can not understand any evolution, or impairment or advancement in mind, and I believe we often confound mental and cerebral functions. I can understand how machinery can be perfected for the application of the power of electricity, and a very ordinary machine can be converted into a very fine machine, but this would not be the evolution of electricity.

DR. EDWARD E. MAYER—I confess my inability to exactly understand the gentleman; it seems to me that he is indulging in a play of words. I wish that he would exactly define what he means by mental functions and by cerebral functions. He assuredly has not in mind the old metaphysical views on this question. The mental functions must certainly develop with the development of the mind. The mind of a child is perfectly blank, and to a certain extent we can write on it what we wish. The older it becomes, the more developed its brain is; the more receptive is its mind. The doctor's comparison with a machine is rather inappropriate in our estimation. We are not dealing with material actions or products, but with chemie and vital forces. At the present day, metaphysical abstractions are certainly not in place among a body of physicians.

ANASTOMOSIS OF THE URETERS WITH THE
INTESTINE.

A HISTORICAL AND EXPERIMENTAL RESEARCH.*

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The experimental work forming the basis of this article was undertaken with the view of studying the changes resulting from anastomosing the ureters with the intestinal tract, and of determining whether the procedure could with safety be employed in human beings. The labors of other experimenters in this field have abundantly demonstrated that in dogs, at least, the large bowel can be employed as a receptacle for urine and the animal have good control over its anal sphincter, and liquid feces be evacuated at regular intervals without resulting proctitis. But the more important and far-reaching changes in the kidneys and ureters, resulting from the bacterial invasion from the septic cavity into which the ureteral orifices open, has not been satisfactorily studied.

Will infection of the kidney invariably follow its ureteral union with the intestine? If this be true, can perfection of operative technique reduce this infection to a minimum, so that the kidney can recover and remain a useful organ? To the thoughtful, conscientious surgeon these questions are paramount, and must be carefully answered before he decides to subject his patient to an operation from which, once performed, there is no retreat.

My work, as the title indicates, has been in two directions: First, I have carefully, and I trust exhaustively, gone over the literature of the subject. This was a task of considerable magnitude, as some of the cases were hidden away in transactions or obscure reports. In many instances the original had been quoted incorrectly and the error handed down from one writer to

another. In most instances the abstracts have been made from the original sources, or, at least, the original has been gone over carefully to verify the abstract. I have endeavored to arrange the material in such a form as to be of service to future investigators.

The second portion of the article is devoted to my own experiments, from which, together with the work of others, my general conclusions are drawn.

From a historical standpoint Richardson's²⁸ case merits the first consideration, since it is the only one of its kind on record. The case was reported in the "Philosophical Transactions" in the year 1713, and is as follows:

"One John Woosnape, of North Bierly, a poor boy, lived till he was 17 years of age and never made water, and yet was very healthy, vigorous, and active. He had constantly diarrhea on him, but without much uneasiness. The obstruction must have been in the kidneys, for he never had any inclination to make water. The serous part of the blood, which should have been thrown off by the urine, was discharged by the celiac and mesenteric arteries by the mediation of the glands into the guts. He died of a fever."

It is certainly difficult to decide from this report whether the author actually saw or only heard of the case. At any rate, from a scientific standpoint it is practically useless, and certainly does not warrant the deduction that the human being can live seventeen years with a blending of the urinary and intestinal tracts. Yet, after a mention of the cloaca in certain animals, and deducing from this that the same condition may be produced in man and be compatible with life, certain writers have endeavored to clinch the argument by referring to Richardson's case. That some of them have never read the original is apparent, from the fact that the reference is incorrectly given.

ANIMAL EXPERIMENTS IN URETERO-INTESTINAL ANASTOMOSIS.

Can the results of animal experimentation with uretero-intestinal anastomosis be used to advantage in establishing the place of the operation in human surgery?

In a general way this query can be answered in the affirmative. In spite of the technical difficulties of the operation in an animal, such as the dog, it is possible to so perfect the technique as to greatly reduce the primary mortality, and the same may be said of the operation in man. Gross errors in technique should not be counted in determining the value of the operation either in animals or human beings. While it may be true, as claimed by some, that the human kidney is a more highly developed organ than is that of the dog, it is true only to a limited extent that its power of resisting infection is thereby greater.

Various objections to animal experimentation as a test of the value of uretero-intestinal implantation in man have been raised, but they can not be said to be upheld by facts. Certainly the upright or prone position can have absolutely no influence on the action of the colon bacillus in producing an ascending pyelonephritis. A septic cavity, such as the rectum, is filled with myriads of these bacteria, and no action of gravity or the mere flushing out of this cavity can make it aseptic to any appreciable degree. Nor is it at all probable that the colon bacillus in the dog's rectum is any more virulent than the same germ in the human intestine.

Yet all these theories have been advanced to explain the cause of the failures on the experimenter's part. A careful study of the literature of the subject as well as the results of my own experimental work have con-

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