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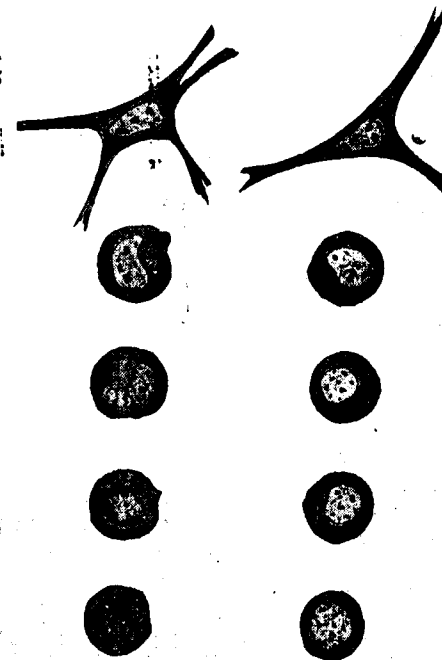
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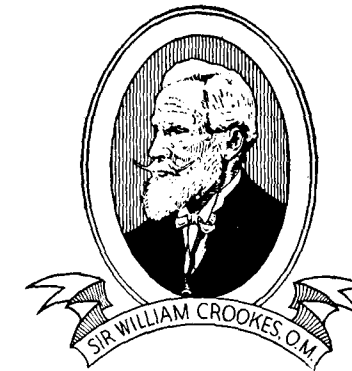
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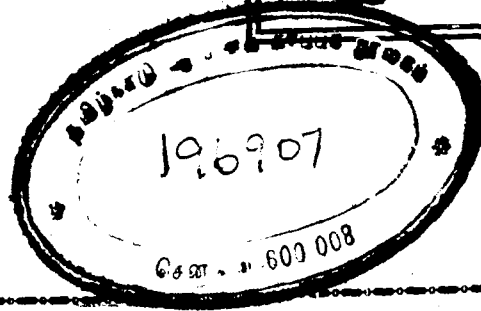
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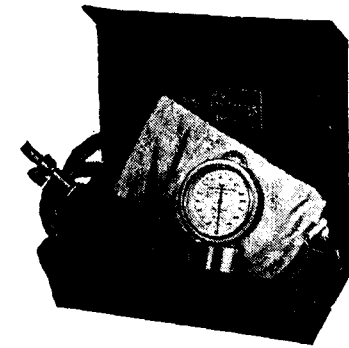
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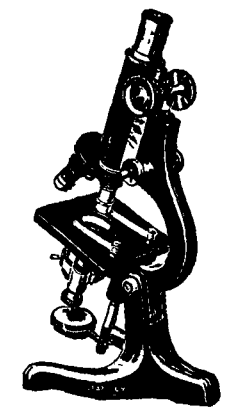
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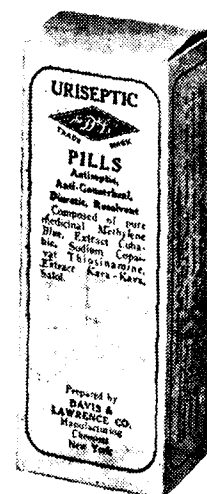
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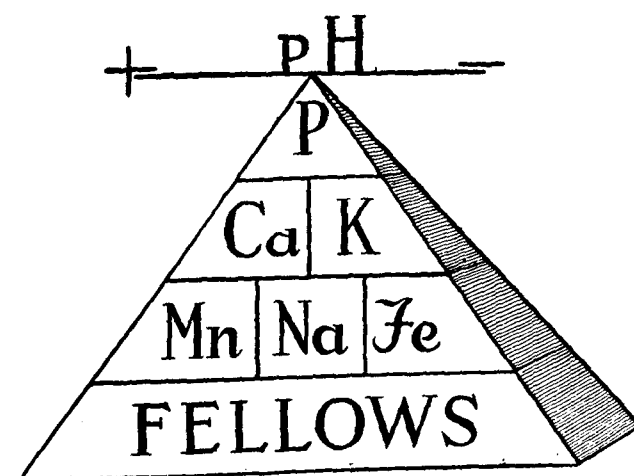
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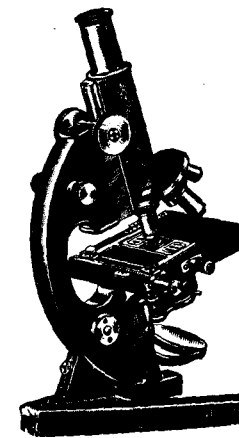
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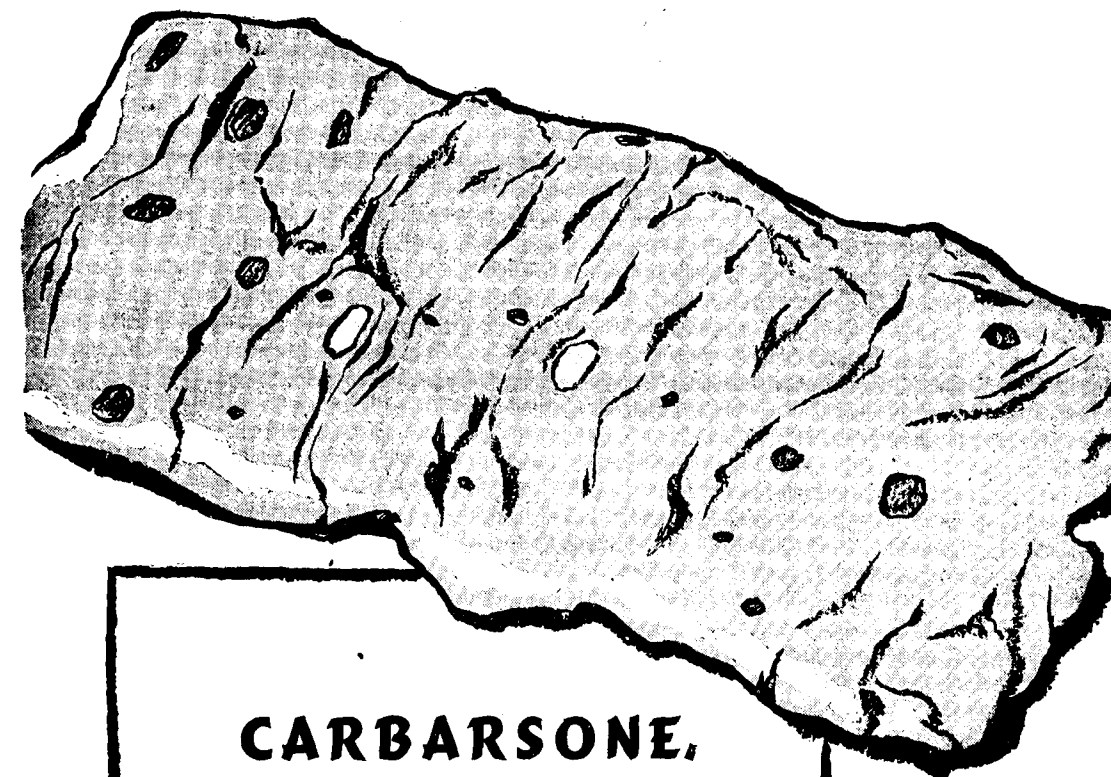
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TREATMENT OF CARDIAC DECOMPENSATION.*

BY

LOUIS FAUGERES BISHOP, Jr. M.D.

Cardiac decompensation is the inability of the heart to maintain a circulation adequate to the needs of the individual organism, taking into consideration age and sex. The term, cardiac decompensation, designates to some extent a functional condition, and therefore, it must be considered in all its stages.

The physician should first realize what he hopes to accomplish. In treatment the pathological background must always be studied. Obviously, he cannot hope to change the pathology already present in the heart. He is concerned with the relief of symptoms and in the restoration of as much activity to the patient as is possible. Frequently, amazingly brilliant results can be obtained in apparently hopeless cases. Seldom in any other phase of medicine do such great surprises occur as may take place in the care of the decompensated heart.

It must be realized that early diagnosis is of particular importance. This cannot be done by listening to heart sounds. The diagnosis of the lesser grades of decompensation is in fact not usually made by physical examination at all, but by the careful analysis of symptoms. The physician must then look carefully to detect decompensation. He must make a careful inspection of the patient. The breathing is important. The condition of the cervical veins must be noted. The important signs, such as tenderness of the liver, moist rales at the lung bases, cedema of the extremities, gallop rhythm, all must not be forgotten. In short, one must be ever on guard to evaluate the degree of decompensation that may be present.

In addition to chronic decompensation, one must be able to recognize that there is an acute type, where the outstanding signs and symptoms may be those of pulmonary cedema or paroxysmal dyspnoea, frequently called "cardiac asthma". This acute decompensation is often associated with left ventricular failure, and may complicate such pathological states as chronic high blood pressure, cardiovascular lues, aortic stenosis or coronary thrombosis. While many of the underlying principles of the treatment of cardiac decompensation are the same, irrespective of the etiological background, it is important to recognize what causative factors are present in each case.

At the beginning of treatment rest is of importance. It is not always easy to explain the reason for rest to a patient. One persuasive argument to suggest is that the average individual at complete rest in

bed saves about 25,000 heart beats each day, as compared to the patient being ambulatory. In order that the mind as well as the body may rest, sometimes even at a risk it is better to allow a patient a few days to get his affairs straightened out before putting him to bed.

So that the most beneficial results may be secured in the nursing of cardiac patients, the cardiologist should be familiar with all the known methods of securing adequate comfort for the patient with cardiac decompensation. This should include a knowledge of the various types of beds and chairs obtainable in his community.

All cases of cardiac decompensation, with few exceptions, require adequate digitalization. It must not then be forgotten that in the presence of organic heart disease, with or without evidence of decreasing reserve, digitalis may increase the tone of the ventricular muscle. It may prevent in some measure the tendency of the heart to dilate, and thereby postpones the recurrence of congestive heart failure. Each individual must be carefully studied to determine what is his maintenance dose; this is usually one to two grains a day but it may be extremely variable. In the average patient the powdered leaf of digitalis given by mouth is entirely satisfactory, but occasionally the stronger preparations are found useful, such as ouabain and strophanthin. Many physicians prefer to develop their own methods of giving digitalis. One very general method is to give the powdered leaf in half-grain tablets which makes it easy to grade dosage.

The continuous use of digitalis has been somewhat discountenanced in recent years, but lately is coming to be recognized as one of the most important methods of prevention of attacks of congestive heart failure.

The most outstanding advance in the past ten years in the treatment of cardiac decompensation, where cedema is present, is the use of mercurial diuretics. Early fear of their use has now entirely disappeared. Certain preparations, such as salyrgan or mercupurin, have stood the test of time, and are given either intravenously, intramuscularly, or by rectum.

One of the important newer methods of giving mercurial diuretics is by rectal administration (suppositories). Given in this way, a mild degree of acidosis seems to render the mercurial suppositories more effective. Therefore, it is necessary to give a gram of ammonium chloride three times a day for two to four days before inserting the rectal suppositories of mercupurin; they are inserted in the morning following a cleansing enema. Mercurial suppositories can be repeated at intervals of from four to six days if necessary. One advantage of rectal administration is that it avoids the necessity of the diuretic being given by a physician. Each suppository contains about half a

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of mercurial salt, and is equal to about one-half times the amount of organic mercury represented in a 2 cc ampoule of mercupurin.

There is very little evidence to prove that mercurial poisoning is of frequent occurrence. It has been noted on the contrary that a number of persons with congestive heart failure have had mercurial diuretics over long periods of time without developing such ill effects. When mercurial poisoning does occur it is usually in the form of mercurial stomatitis; it may also cause progressive weakness. Such effect from mercurial diuretics is the exception and not the rule.

The sedatives constitute an important part in the treatment of cardiac decompensation. One should not hesitate to give an initial dose of morphine because usually the onset of congestive heart failure is insidious, and too, the patient may have had but little rest prior to seeing a physician. An immediate dose of morphine often gives great confidence to patients and renders the remainder of the management relatively easy. The use of other sedatives in cardiac decompensation is often a matter of individual preference.

Diet is of prime importance in the picture of the effective treatment of cardiac decompensation. In relation to diet one must remember that the ultimate function of the heart is to supply the tissues of the body with oxygen. If less oxygen is required, it follows the heart has less to do. Effective cardiac therapy in the presence of heart failure is that which decreases the work which the heart is called upon to do. Therefore, most diets in cardiac decompensation are constructed on a basis of their low caloric value.

Karell, a physician of the Russian court, as early as 1866, wrote a report called "De la Cure du Lait". This milk diet was used for everything. Interestingly enough, it is still used in many large hospitals, in the later stages of cardiac decompensation. Karell employed "pure skimmed milk," forbidding everything else. He stressed the importance of giving the milk at exact four hour intervals three to four times daily in the following amounts: "2 to 6 ounces equal to 60 to 200 grms. To be drunk slowly in small portions." This procedure was advised for the first week. Thereafter the intake of milk was to be gradually increased to "two bottles". While he entirely recognized that he could furnish no scientific basis for the diet, he

contended that this should constitute no objection to its use. He reported almost complete return to well-being in patients with organic heart disease.

There have been other diets employed in the treatment of congestive heart failure and the feature common to all these diets is the low caloric value. Recent studies seem to have confirmed the fact that caloric restriction is an important aid in the management of heart failure. It seems now that under modern methods and under controlled conditions, we have succeeded in confirming centuries' old experience and have placed on a rational basis empiric recommendations.

The severe purge which used to be the rule in cardiac decompensation is now practically abandoned. The removal of fluid by other methods is so much more effective, and the inconvenience resulting from such severe purging has outweighed the benefits. When one considers the amount of physical energy that is wasted, one can easily see that mild catharsis is the best method of handling the bowel problem in cardiac decompensation.

The other methods of removal of fluid by paracentesis and thoracentesis do not seem to be nearly as often necessary as before the use of mercurial diuretics, nor is it necessary to drain off the fluids, such as one finds on looking at the methods of treating oedema in the early days.

Oxygen may be of benefit in the treatment of congestive heart failure, particularly in conjunction with other methods and where cyanosis is present. While an oxygen tent may not always be convenient or economical, plenty of oxygen can be administered by nasal catheter, provided a few practical points are kept in mind: first, that there is sufficient saturation of the oxygen with moisture so that the throat may not be burned; and second, that the catheters are not too stiff.

Considering the therapy of cardiac decompensation over the past ten years, while there does not seem to have resulted the discovery of many new methods, there is a certain element of satisfaction in a wider range of cardiac observation and a better correlation of diagnosis. As a result of this increase in technical knowledge, there is undoubtedly a better application of older proved therapy.

NEUROTIC CHILDREN AND THEIR MANAGEMENT.

BY

TOM A. WILLIAMS, M.B., C.M. (Edin.)

Peculiarities once called neurotic, and muddled in treatment, are now understood to be essentially simple, and are readily dealt with in relatively little time. Such disorders, when psychological, are generally known as maladjustments. They can be described in homely language understandable by any mother as Douglas Thom has shown in the very simple leaflets now issued by the Federal Government of the U. S. A. Nevertheless, any individual case may require for its elucidation much knowledge both of psychology and medicine, great finesse in approaching the child, as well as skill in the elaboration of methods for its adjustment to surroundings which may be difficult.

The teacher's prime duty has been the development of children's intellects, but in attaining this object, obstacles have to be overcome which are in the sphere of the child's behaviour. This depends upon emotional trends which have little to do with academic interests. They have arisen through the child's surroundings even in infancy, but are also the product of an innate temperament. The child's disposition is also much modified by the physical state. So is the intellectual capacity; and this has been recognized in the movement for special nutrition, for the care of the teeth and for bodily hygiene in general.

But the behaviour discipline of the child has not been adequately dealt with. The frequency of problems of conduct as obstacles to the child's intellectual and social development has lately been widely recognized. To meet this, Mental Hygiene Clinics have been established for public school children in over two hundred American cities. The function of these is to penetrate the individual psychology of the child who is not adjusted well to his class-room work, in order to re-direct the child's emotional trends, and thus harmonize it with what is, to some children, a difficult environment.

MALADJUSTMENT IN HOME.

Research usually shows that it is maladjustment in the home which is primarily at fault. The Mental hygiene of the parents then becomes an objective also, more particularly as concerns children in the primary classes. But in older children, more especially in the high schools, it is the child itself which has to be dealt with as a separate individual; for without its co-operation, the efforts of the parents will be vain, even when they can be re-educated—often a difficult and tedious matter. It is no work for amateurs. Only a highly trained and experienced psychiatrist can hope to succeed in difficult cases, and

the majority of the cases are difficult to involve common sense nor pedagogic training in the absence of professional knowledge of psychopathology.

INTERNAL SECRECTIONS AND EXTERNAL INFLUENCES

Disturbances of internal secretion have often been responsible; and treatment by rehabilitation of the function of some gland (a dangerous procedure in the hands of the inexperienced) has been most successful in numerous instances. Most cases, however, are psychogenetic, that is to say, caused by harmful influences which have spoiled the temper, produced morbid fears, fostered shame or diffidence, or have encouraged reckless or brash attitudes, or have fed egotism, or have nursed a morbid sensitivity, or have failed to take account of the fact that a child has emotions, sentiments, and mental attitudes which cannot be ridden over roughshod without serious pain. All this looks like mere common sense, but in practice, it means very careful skill to elicit from the child the responses which will give the key to the morbid situation which is the root of difficulties in the school or home.

THIEVING.

Very few can picture how they felt when children. They forget how lacking in purpose is a child's behaviour, how he is the prey of the feeling of the moment.

A boy was brought to the clinic because he would persist in stealing. It was found that he stole not because he wished more food, luxuries or moving pictures, but because of a vague state of discomfort. The act of theft furnished a stimulus; it was not the theft which he enjoyed but the action thereof. He might just as well have resorted to smoking, candy gorging, or mischief with the gang. Two courses of treatment were utilized. One an improvement of the physical state by opotherapy. This in itself would not have done away with the stealing, which had become a habit. The changing of this required the furnishing of an interest which gave greater satisfaction than theft. In some cases this has been afforded by a carpenter's bench at home, or by developing interest in radio, while in other cases athletics has been the means of salvation. Boy scouting and expeditions and similar activities are more suitable for other boys. No remedy must be arbitrary, each must be fitted to special characters of the patient and the circumstances.

NOCTURNAL INCONTINENCE.

Nocturnal incontinence of the bladder used to be attributed to local pathology. A little reflection shows that structural defect would prevent continence in the day-time too. It is the nervous system which controls both bladder sphincter and ejector. The autonomic

system of mercurial part in this. But it is not the predominant times that drugs for redressing autonomic imbalance do not prevent nocturnal incontinence. For this is a psychic mechanism. Even domestic mamalia are conditioned to control micturition. When the cerebral spinal nervous system is not grossly defective as in idiots and the paralysed it can be taught to control the sphincter, as every mother knows. Its failure to do so in a child is a sign of maladjustment to its surroundings. The cause of this is usually lack of satisfaction of the activities, or more commonly of the affections. Overinhibition of these is easily put right when the parents are taught to co-operate. Incontinence is frequent in boarding schools of the conventionally rigid type. If the house staff cannot be made to understand the personal equation of a boy so afflicted, he had better be removed to a school aiming at discipline, from within rather than imposing a goosetep from without. But even then the nocturnal control automatism will have to be reinforced by those expedients of psychotherapy most suitable to the particular case.

FEAR

Although it is true that fascinations and aversions sometimes precipitate psychoneuroses, by far the commonest causative emotion is fear. It is equally true, however, that thousands of fears occupy the minds of others who are not actually psychoneurotic; but many of them are potentially so and become so when stresses accumulate or when resistance diminishes, or when special insistence is added to the stress by wrong thinking. Suggestion from without plays a strong part in this. Although fears bred by superstitions are becoming less frequent, yet the anxieties of persons of to-day are found to be similar in psychological mechanism although their basis masquerades as science or prudence. The fear of disease is usually due to ignorance of the nature or cause of the disease one fears. Morbid apprehension of cancer, tuberculosis, venereal disorder, spinal disease is always ill founded. Even dreads of particular situations, acts or persons are found to be based upon distorted viewpoints just as is a superstitious fear so based. Hence the great importance of re-educative procedures in removing psychoneurotic fears.

A little girl while walking in the evening from one house to another was suddenly startled by the loud roar of a passing street car. She realized that she was alone, and became alarmed because of a possible vague danger. From this arose the habit of fearfulness which accompanied her into school life, which rendered her timid socially also. However, without much effort she succeeded in evading the test of circumstance; but in college she had to face recitations and other occasions of being conspicuous. Diffi-

dence and fear so poisoned her thoughts that she was unable to concentrate at work. Insomnia brought agitation and she had to leave college disappointed and exhausted to the point of torpidity. By means of giving her an understanding of this mechanism, the setting of her mind was changed, so that fear no longer beset her and she became happy and well in a few weeks, marrying a year later. (See author's "Dreads and Besetting Fears," Little, Brown and Co., Boston, 1923, for relation of many cases in full.)

A girl of sixteen had to be removed from a finishing school two days after she entered it because of intense emotivity. Her intelligent parents could not conceive of anything in the child's life of which they were not thoroughly conversant; and yet careful exploration showed that the poor girl had been living in daily terror of retiring to bed alone, and would sit shivering for hours on the stairs in her nightgown until her elders came to bed. The terror invaded her sleep, preventing proper rest, with its accompanying weaknesses, the attention to which was detrimental to the development of her character. The reconditioning was effected in a month. As a result of two weeks treatment, she was able to undertake school and social life with entire success so that for six years she has been untroubled by her former emotivity.

REMORSE

A lad of fourteen had shown inattentiveness at school, daydreaming and absence of mind at home. Psychic exploration showed that his ruminations were because of the wish to atone for the wickedness he felt, because of having been blamed, on account of the jealousy he showed, when a little boy, towards his newly born brother. The psychology of his trend of mind was worked out in a period of four months during four interviews. The reconditioning of his distressing emotions enabled him to finish his school and later to enter what was to be his future occupation.

INFERIORITY COMPLEX.

A girl of eleven fell below grade because extremely inattentive, and was constantly on the alert to draw attention to herself on the part of both teachers and other pupils. She was looked upon by the school nurses as an exhibitionist. Examination revealed an intelligence level two years below her age, and a bodily unskilfulness which precluded success in games. A sense of inferiority of which she was scarcely even aware was the motive for her behaviour which was an effort to find social satisfaction in showing off. This compensated her inferiority in other respects. She greatly improved when these factors were dealt with in the school.

SEX OFFENCES.

The same is true of sex offences which seldom arise from depravity, but more often, like thieving, from the need of activity which had been accidentally misdirected. "Satan and the idle hands" remains true to this day. The suggestibility of the child leads to easy conformity with what goes on around him and thieving, sex offences and truancy as well often have this origin.

TANTRUMS.

An adopted girl of nine was brought to the clinic because of severe tantrums. The mother was very eager to make her happy, and the child professed much affection for her. But any attempt at control might provoke a passionate outburst of screaming and violence. This behavior was due to the very common resentment against control directed particularly to oneself; for when in a group as in the Children's Home, where she was sent the child conformed perfectly. Her reaction was rapid and violent although it might endure only several moments. Mere inhibition by herself, so-called self-control only succeeded for a day or two, after which a lapse was invariable. It was concluded that the adopted mother, although meaning well, was unable to acquire the requisite touch; and not being accustomed to children aggravated the little girl so that no expedient we tried succeeded at home.

This type of behaviour is all too common in adults although for the most part overt rage is not manifested. Susceptibility to slight in these cases becomes a vice which may even lead to paranoid insanity which in an adult can be eliminated only by psychological reconditioning at the hands of an expert leading to a truer social philosophy. Children should be brought up in such a way that they do not look upon themselves as specially privileged creatures kept in cotton wool.

SENSE OF INJURY.

A wrangling sullenness under a sense of injury is almost more destructive to the morale of its victim than are rages because there is less chance of it being kept in bounds through social contact. It is surprising how soon this attitude can be converted into a cheerful co-operation in the clinic through the enlightenment of the child concerning its own motivations of which it was not previously aware.

Fears, malice, envy, jealousy, shame, anxiety, restlessness, discouragement and other morbid emotions can be successfully transformed into healthy sentiments through a sympathetic understanding of a competent psychiatrist. The rectification of faulty emotional attitudes is of incalculable benefit, not only to the child itself and its family, but to the teachers and other children in the school.

TREATMENT. To be involve

The management of a patient in the clinic is a function of the nervous system are disturbed can only be properly undertaken as a result of a correct diagnosis. This means more than giving Greek names to symptoms; it means an understanding of the reactions which are preventing the patient from performing his functions, from making movements he should, from having the sensations we expect, from thinking as clearly as he ought, from feeling in harmony with the situation in which he is, and from believing as he should.

In investigating this question, we first try to find if the disturbance of function is the result of a lesion in the nervous system. If it is so it manifests itself by clear reactions known as physical signs, and the case is relatively a simple one to a neurologist who knows his business. The management of these conditions is always physical, whether surgical or medical. When the functional disturbances are not caused by lesions there are two origins possible. One of these is the interference with neural activity by poisons such as those which are fabricated by bacteria. The functional disturbance of the brain shown in the course of the infection by Ebert's bacillus, known as typhoid fever is a familiar example. Disturbances of neural functions by poisons which had not come from bacilli are familiar to every one in alcoholism and in opium, cocaine and hashish poisons. The management of these effects is always physical, whether surgical or medical. Functional disturbances of which the chemistry is now being elucidated occur in the disorders of metabolism known as diabetes, Bright's disease, Grave's disease, etc. When the glandular secretions are altered too, the central or peripheral nervous system may be disturbed chemically. The treatment of the disorders too, must be physical. To require physical treatment we need not exclude the use of psychological treatment also, in order to antagonize some of the effects of the physical disorder which may even be aggravated in the absence of proper psychotherapeutic care. But no amount of this will suffice to get rid of the patient's disease. In principle, the situation is that which is so often served in acute alcoholism or febrile delirium. In both of these, quiet surroundings and a nurse's soothing hand are of value, but in neither will they effect recovery; for that requires the restoration of a healthy metabolism, by overcoming an overmastering toxicosis. Psychotherapy is adjuvant, advantageous, but not essential.

But in a great many instances improper functioning of the nervous system is exhibited by persons who are not poisoned and who have no lesions of the part of the nervous system showing the symptoms. It is the physical stimuli required for the regulating behaviour which have been at fault. We call these psychological disturbances. Their management is neither a question of deal-

ing of mercurialism of acting against poisons nor of modifying times thereon. Their management consists of modifying incoming stimuli, in order that we may modify outgoing reactions, that is behaviour.

We now know why a child steals, lies, is shy, stammers, is jealous, quarrelsome, violent, slovenly; and we know how to prevent each of these vicious tendencies, and even to dispel them when formed. We can to some extent measure the character of individuals, at least to guide them towards occupations to which they are suited emotionally. The intellectual potentialities of a child or adult can be even more accurately esti-

mated; and the measurement of intelligence is now a standard procedure in most enlightened schools.

The above are only some of the many ways in which are being helped by psychological measures struggling and often discontented humanity of to-day. It is the science to which Professor Schiller, the Oxford pragmatist, looks for human regeneration, as he declares in his Tantalus, that admirable criticism of the pessimistic forebodings of Bertrand Russell in Icarus, and of the fanciful and pseudo-scientific forecasting of Dr. Haldane in Daedalus.

GLAUCOMA: CLASSIFICATION AND ETIOLOGY.

BY

HANS SCHROEDER, M.D.

CLASSIFICATION.

Before we can make a diagnosis of glaucoma when a patient presents himself to the ophthalmologist or general practitioner, we have to determine if the symptoms present conform to those generally found in glaucoma, *viz.*, increased tension or hardness of the eyeball, failing vision, contraction of the visual field, more or less pronounced photopsic manifestations, cloudiness of the media, excavation of the optic disc, and pain.¹ To these may be added: insensitivity of the cornea, and iridoplegia; however, enough confusion has been caused by haphazard diagnoses with the former symptoms, that it might be better to omit the last two.

Since some of the symptoms, of those enumerated above, are shared by many eye diseases, much confusion has been caused in the diagnosis of glaucoma—and a rational treatment based on the etiology. For this reason no clear-cut classification exists, and I had to reclassify the glaucoma group on the basis of etiology. Ordinarily, glaucoma is classified into primary and secondary. This may be a convenient classification, but is meaningless from a clinical standpoint. Since secondary means following something else, we have to ask what preceded it. When we are ignorant of the disease preceding it (on the basis of this classification), we are obliged to call it primary. I cannot agree with such a classification, for our knowledge of body pathology is so limited that it is bound to lead to failure. Strictly speaking, there is no such disease as a primary disease, for any disease follows some other disorder; this may be a metabolic or infectious disorder superimposed upon an anatomical or physiological abnormality.

On the basis of etiology and treatment I had to reclassify glaucoma into primary and traumatic, the latter comprising some of those formerly called secondary.²

The former classification, as given by May, is as follows:—

Primary	{ Congestive (Non-congestive (simple))	{ Acute Subacute Chronic	{ (Stages) Prodromal Active Glaucoma Glaucomatous state Absolute Glaucoma Degeneration Glaucoma fulminans
Secondary	{ Acute Chronic		
Congenital	{ Haemorrhagic (Juvenile)		

(Hydrophthalmos, Buphtalmos, Keratoglobos)

My classification, based on etiology to be involved by the

Primary	{ Inflammatory Non-inflammatory	{ Acute Subacute Chronic	{ Active Glaucoma Glaucomatous state Absolute Glaucoma Degeneration Glaucoma fulminans
Traumatic	{ Acute Chronic	{ Chronic ("Simple") Haemorrhagic Juvenile	{ Malignant Glaucoma

Leaving out of consideration, for the time being, those cases presenting some of the symptoms of glaucoma, which are due to trauma, as dealt with later, we have that large group of primary glaucoma. The division into inflammatory and non-inflammatory is convenient, and of some use in treatment, since the inflammatory type requires additional local treatment which is not necessary for the non-inflammatory type. Basically the pathology is the same, except that in the inflammatory type there is an infection superimposed upon the pre-existing non-inflammatory glaucoma. This statement will not be accepted by many ophthalmologists, but we must remember that an infection is implanted on a diseased eye, which disease is thereby aggravated, rather than that an infection can produce an edema of the sclera and cornea, as discussed later.

The subdivision of acute, subacute and chronic has no real clinical significance, except perhaps to indicate the degree of pathology and the duration of the disease process. The different stages give information as to the clinical status of the condition.

The condition formerly called secondary acute is non-existent, for glaucoma does not follow an iritis or iridocyclitis, or any other eye disease, but is pre-existing; the infection is superimposed upon the glaucomatous condition. A glaucomatous eye is a diseased eye with impaired nutrition, and an infection takes place more easily than in the normal eye. The same applies to secondary chronic glaucoma.

In haemorrhagic glaucoma the haemorrhage is secondary to the glaucoma. While the haemorrhage may produce a temporarily increased tension, the haemorrhage is due to an increased permeability of the choroidal vessels (or to trauma). Since blood transfusion may relieve this condition, it shows that the pathology underlying this condition is identical with primary glaucoma, as proved by my clinical report³; we have, therefore, to classify it with primary glaucoma.

Those cases of glaucoma termed congenital are better called juvenile, for most of them develop between the third and seventh year of life. While intra-uterine development of ocular malnutrition, and abnormal structure resulting therefrom, may be possible,

natur mercurial protect the offspring is so dominant that the times the will suffer long before the foetus is affected.

ETIOLOGY.

Since primary glaucoma is the theme of this discussion, I shall consider traumatic glaucoma first. Traumatic glaucoma following dislocation of the lens, and discission for juvenile cataract, is familiar to all ophthalmologists; it may also be produced by neoplasms within the orbit, particularly in the vitreous. Glaucoma following cataract extraction is traumatic, unless it was present before the operation and was overlooked, as mentioned by Elschnig; it is due to the rapid decompression when the corneo-scleral incision is made hastily. In this condition the sudden release of intra-ocular pressure causes a dilatation of the choroidal vessels with stretching of the walls, which cannot be compensated when the normal tension is re-established. This explains also why medical treatment of this condition is so hopeless, for we have no means by which we can restore the damaged elasticity of the vessels, especially as we are dealing with patients of advanced age in whom arteriosclerotic changes in the vessels are so prevalent. There is no remedy for these cases, as I see it, and utmost care has to be exercised by the surgeon at the time he does the decompression. The same principle underlies the decompression operation for glaucoma, for in many of these cases the original primary glaucoma is changed into a traumatic one—with its unfavourable prognosis. I have seen surgeons perform the Elliott trephine operation with entire abandon of this princi-

ple, the trephine wiggling around as if this were a refinement of the operation. When they got into the anterior chamber, it was with a bang, and they withdrew the trephine as if the aim was rapid withdrawal, whereas the trephine should be withdrawn exceedingly slowly to allow a gradual adjustment of the intra-ocular fluid. Needless to say, such surgeons had very unfavourable results from a clinical standpoint. However, I am not in favour of any operation in primary glaucoma, for the operation destroys any chance of recovery by medical means, since the relation of the structures within the eye is altered. I have shown in my clinical report³ that such cases cannot be benefited by medical treatment. The change which takes place is that the anterior limiting membrane of the vitreous is ruptured, for as Fischer has shown, vitreous substance can be demonstrated ultramicroscopically in the punctate from the anterior chamber after the operation. This accounts for the improvement after operation for glaucoma; a very uncertain procedure at best. A better appreciation of the underlying factors will be gained when we discuss the pathological changes of the eye in glaucoma.

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AN HISTORICAL OUTLINE OF SCHIZOPHRENIA.*

BY
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PSYCHOLOGICAL CONCEPTIONS.

The evolution of the conception of dementia præcox as a definite disease with characteristic features has been a gradual one, and it has been said with truth that "the history of dementia præcox is really that of psychiatry as a whole".¹

In 1674, the dementia type of deterioration was described by Willis (De Amina Brutorum), who recognised a progressive descent into hebetude dating from adolescence. Pinel described similar cases, and called them "idiotism", and Esquirol used the term "accidental or acquired idiocy" (Des Maladies Mentales). Later, however, idiocy became limited to early and congenital defects, while dementia was confined to acquired deteriorations, and these non-organised deteriorations began to be divided into partial and total insanities, into which were incorporated mania, melancholia and confusion.

About the middle of the nineteenth century, Morel first used the term "démence précoce", and described in it a "stupidité", making of his concept the picture of a familial degeneracy. Later came the use of the term "vesania" or total insanity, first used by Lavages and Cullen. Under this heading were included mania, melancholia, confusion or paranoia and dementia, to which were later added neurasthenia as a prodromal symptom, the term being used as descriptive of a fatigue syndrome.

Magnan² at this time described a "délire chronique a evolution systematique" which was the equivalent of a paranoid type of dementia præcox.

In 1863, Kahlbaum made a considerable advance along the lines formulated by Morel, having in mind unity of cause, course and outcome in cases of this disease. He attempted a much more complete attitude to the patient in which there was both comprehensiveness and comprehension. In his conception, the general clinical findings of whatever kind were given equal value with the psychic symptoms, and here we find the first frank attempt to regard the patient's illness as a dysfunction of a psychobiological unit—that is to say, a disorder of the entire organism. He described four groups of disorder:

- (I) Vesania, equivalent to dementia præcox, but including in it a progress of the type already mentioned.
- (II) Vecordias (wrong-heartedness); the affective psychoses of the manic-depressive type.

- (III) The Dysphrenias, equivalent to be involved exhaustive reactions. by betray
- (IV) The Paraphrenias, psychoses determined by age: neophrenia in infancy: pebephrenia in youth: presbyophrenia in old age.

This classification was criticised as being impossible to square with clinical evidence.

Hecker described as hebephrenia one of Kahlbaum's paraphrenias, the age-bound disorder. At about the same time Kahlbaum described katatonia as a vesania similar to paresis with motor symptoms. Therefore, in this way, the grouping that he had set up was rendered less firm.

Thereafter, there occurred what Meyer calls a "paranoification of psychiatry" by Westphal, Krafft-Ebing and Schule, during which paranoias of various types came to occupy the place of dementia præcox. This was in response to a psychology of emotion, which tended to create a separation between affective and intellectual disorder. The manic-depressive group was included in the affective series, and under the paranoias were included part of the older vesania with paranoia as a primary state. At the same time, in America, Spitzka, Hammond and Pick began to describe a progressive primary dementia, and about this time also began Kræpelin's work in this connection.

In 1893, he described dementia præcox as synonymous with hebephrenia (Hecker), and also included katatonia and dementia paranoides, while in a review of Zieher's work, which was full of a series of paranoias, he grouped all primary and secondary dementias in a progressive deteriorative dementing process. Thus dementia præcox made its debut at the hands of Kræpelin in 1898 as a result, to some extent of the work of Morel, Kahlbaum and Hecker. The aim of Kræpelin, as of others, was to show a uniformity of cause, course and outcome. At the time the description met practically none of these requirements, but at any rate a definite concept had been brought forward.

While up to this point the object had been to secure a disease entity, from now on attention began to be directed to attempting an understanding of the condition. In 1896, Meyer, working at the Worcester Hospital, developed a general analytic-synthetic principle, which was gradually expanded into "a conception of dementia præcox as depending on a special personality and constitution, on habit disorganization: leaving the internal working and development of the functional and structural deficit as possibly incidental, still to be worked out".

ROYAL ROAD TO KNOWLEDGE.

Among the first to traverse the "royal road to knowledge of the unconscious" (Freud) among schizophrenic patients was Jung,³ in 1907. He developed

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the delusional symptoms by complexes and hinted at specific personality types, demonstrating also that the products of schizophrenic thought processes are primitive processes. Among them are the works of Freud, (*Totem and Taboo*), of Jung, (*Wandlungen und Symbole der Libido*), of Schilder, (*Wahn und Erkenntnis*), of Storch, (*The Primitive and Archaic Forms of Inner Experiences and Thought in Schizophrenia*).

About this time many contributions from various points of view were made. Stransky developed the conception of an "intra-psychic ataxia" as an explanation of the affect disharmony, and in 1914 Berze suggested a primary insufficiency of mental activity—another way of stating the case for a constitutional defect.

Previous to this, however, Freud had described a case of hallucinatory paranoia, and in 1912, he published a paranoia study. His dynamic attitude was followed by Kempf, who, in 1920, introduced a classification based not so much on formal grouping as on the ætiological process, problems of repression, regression to more primitive thought processes and fixation. In Germany, during the period of Kempf's work, investigation was being carried out along unimaginative and almost purely descriptive lines, but at the same time, Kretschmer took up, in a new and stimulating way, the constitutional factor; and Kahn developed the heredity factor to the point of postulating two inheritable factors: first, a disposition to the disease, and second, the actual progressive process. Among the other lines of investigation pursued at this time were the Abderhalden Tests, Mott's work on gonadal influences, Von Monakow's suggestions as to lesions of the Choroid plexus, and the work of Bruce and Cotton on focal sepsis as an ætiological factor.

At the same time, advances were being made along other lines by Meyer and Kirby in America and by Hoch in Germany. The lines of discussion and theory pursued by these workers led to the recognition of Schizophrenia as a condition in which the ætiology was, if not uniform in quality or quantity, yet constant in its method of activity, so that it produced a group of recognisably similar cases. Now began to be formulated the principle of mental illness as a definite purposive reaction to stresses of a very varying nature. To some extent Kahlbaum had hinted at this and the principle was accepted by Kræpelin.

Turning from the various psychological conceptions of the disease, reference may be made to its pathology.

PATHOLOGICAL CONSIDERATIONS.

The subject of endocrinology has been from time to time in the fore-ground of science and also has suffered an alternating lack of attention and even disrepute.

Some older theories of medicine, among them Galen's "humoral" theory, might be considered in some respects to be the fore-runners of present-day theory. Galen, without any knowledge of the circulation of the blood and lymph, regarded a faulty mixing or proportion of the four juices (gall, phlegm, blood and pancreatic juice) of the body as the cause of disease. In his work of extending and confirming this theory, Theophile de Borden, in 1775, was probably the first to clearly formulate a general theory of internal secretions, in many respects very similar to the theory as now understood. In 1801, Legallois suggested that the blood undergoes a change as a result of acquiring substances from the organs through which it passes. A. R. Berthold, in 1849, furnished experimental evidence of the production of substances in the internal secreting tissues which exerted profound effects on the animal, by his experiments and observations in grafting and transplanting the testes of cocks. Berthold was perhaps the first to furnish actual experimental data, correctly interpreted, demonstrating the internal secretions, for he showed that even after severance of all the nerves to the gonads, the sex impulse was not destroyed.

In 1855, Claude Bernard coined the words "internal secretion" as distinguished from external secretion. He regarded glycogen as the internal secretion of the liver and definitely showed the synthetic capacity of the body cells to produce new compounds. Now, it is convenient to restrict the term to secretions containing specific organic substances, such as the active chemical agents which are produced by certain ductless glands.

In 1856, the first work by M. Schiff of thyroidectomy in animals was performed and suggested internal secretion effects.

In 1873, Gull of London, described hypothyroidism and hyperthyroidism. Ord, in his study in 1878, gave the name myxœdema to conditions which were accompanied by deposits of mucin in the subcutaneous tissue and which were associated with thyroid gland deficiency. The condition was being investigated in France at the time by Morvan and by Charcot.

In 1882, J. Reverdin showed that the affection described by Gull in adults, and by Bourneville in children, could occur in either case after a thyroidectomy for goitre. This was a very important discovery which led to the pathogenic treatment of myxœdema-thyroid organo-therapy. In 1886, Moebius attributed exophthalmic goitre to hyperthyroidism.

The actual beginning of the subject is almost universally considered to be June 1st, 1889, the date of the famous lecture of Brown-Sequard before the Societe de Biologie of Paris, when he announced the results of the injection of testicular extracts in his own person. He maintained that the internal secre-

tion of the testicle keeps up physical and sexual strength. When these decrease under the influence of age or disease they can be stimulated by means of injections of the extracts. These ideas had an immediate application—the introduction of testicular extract in therapeutics and an enormous variety of conditions were treated by this medication. The results, however, did not come up to expectations and the theory of Brown-Sequard as regards the testicular extract was abandoned.

In 1886, Pierre Marie described the disease now known as Acromegaly, and, four years afterwards, his pupil Louza-Leite, showed that it had some relation to disturbances of the pituitary.

The syndrome known as "dystrophis-adiposogenitalis", was just described by Babinski in 1900, then by Frolich in 1901. It is found either in infancy or in the adult, sometimes even at the menopause.

The pineal gland was described by Testut as a "degenerated gland with only rudimentary functions or none at all", mentioning that Descartes considered the gland to be the centre of the soul, while Magendie believed that it regulated the circulation of the cerebro-spinal fluid. It was first studied in 1908 in the investigation of tumours of the pineal gland by Marburg and by Frankl-Hochwart. Observations by French writers are still more numerous: those of Raymond and Claude, Apert and Porak being the most important.

The labours of Pighini⁴ and others of the Italian school failed to discover any single fact in the metabolism that was directly characteristic of dementia præcox and allied psychoses. In 1914, Cuneo,⁵ an Italian observer, claimed that by diminishing or increasing the protein fraction of the diet he was able to produce either a calm or an excited phase in a schizophrenic patient.

From time to time various workers in mental disease have formulated ideas regarding the connection of the glands of internal secretion with the different types of psychoses, and literature contains many references to the changes of the endocrine glands in schizophrenia; Kræpelin⁶ in 1881 first called attention to the relation of this disease to the endocrines, especially to the sex glands; Dercum⁷ states that in schizophrenia the various glands of internal secretion have suffered in the course of development of the organism so that their respective functions are subsequently imperfectly and aberrantly performed. He believes that it is not at all unlikely that, while a number of glands, perhaps the entire chain, are involved in most cases, e.g., the gonads may dominate the picture, in others again it is the thymus, in still others it is the system of the pituitary, thyroid and adrenals. He

regards the thymus as most likely to be involved, because cases of schizophrenia frequently betray in childhood the fore-runners of the affection.

From an histological study of two cases Kojima⁸ concludes that the thyroids have an opposite appearance in the male and female: a tendency to hypofunction in the male and hyperfunction in the female. He states that in schizophrenia the glands on the whole are small, especially in the female. In the male, the parathyroids contain watery clear cells and a few eosinophile cells, and in the female, on the contrary, many eosinophile cells. The sexual glands and adrenals are small in the female. Striking changes are seen in the sexual glands, i.e., very slight spermatogenesis in the testes and an appearance of early involution of the ovaries.

Frankel⁹ found the infantile type of genitalia in 72 per cent. of 176 cases of schizophrenia examined. Mott¹⁰ showed pathological changes in the testes and semen, defective maturation of the primordial follicles, degeneration of the nucleus and proliferation of the stroma, so that he believed that schizophrenia results from deficient productive energy of the generative organs based on congenital insufficiency of the gonads. He found a primary regressive atrophy in 27 cases of schizophrenia in which the testes were examined.

Pezard¹¹ states that apparently the testes in the schizophrenic cease growing about the age of puberty or soon after, thus allowing sufficient time in most cases for secondary sexual characteristics to develop, although these are always fully determined. Morse¹² studied 12 male and 13 female schizophrenics dying under 45 years of age and concluded that 16 patients had active gonads. She used as criteria the presence of spermatogenesis, maturing follicles and corpora lutea. She stated that there was no correlation between atrophy of the sex glands and the duration of the mental disease or the degree of psychic deterioration. The conditions in the sex glands of the controls were essentially the same as in the terminal diseases. The pituitaries in nearly half the cases showed a fibrosis which could be correlated to some extent with a similar condition in the gonads. This fibrosis of the pituitary is not peculiar to schizophrenia, but depends rather on the nature and duration of the terminal disease. She stated that the lesions in the adrenals were such as are usually found in the diseases to which the patients succumbed. The thyroid showed changes less frequently than the other endocrines. There was occasionally a mild glandular hyperplasia or increase of connective tissue. From the pathological side, Morse feels that there is very little evidence of primary atrophy of the gonads in schizophrenia, with the possible exception of those cases developing on a basis of mental defect.

THE ROLE OF SEXUAL ORGANS.

Matsumoto,¹³ in a study of the relation between the reproductive organs and schizophrenia, and Lewis,¹⁴ after a careful review of the autopsies of 143 cases of this disease as compared to 458 other autopsies, conclude that gonadal atrophy is more commonly found in schizophrenic cases than in other individuals. Further, that in these cases, the adrenal cortex as a whole is thinned out and pale in colour. The zona glomerulosa is rudimentary and sclerotic and the zona fasciculata shows acinar and cellular alterations.

Geller¹⁵ attempted to show the close relations between the body and psyche in schizophrenia on the basis of sexual function. He found considerable anatomic and functional hypogenitalism in 7 of 8 cases of schizophrenia in women, and agrees with Mott, Fraenkel, Hanck and Kohler, that the disorder is intimately associated with deficient genital function. Serologic tests in these cases were formed by Geller to show destruction of the brain, testis, ovary and often also of the thyroid substrates, more frequently than in other psychoses. In 26 women, his most important finding was that, at the age of sexual maturity, the genital organs were hypoplastic. Therefore, he feels justified in assuming a connection between inferior ovarian function and schizophrenia.

According to Sippel a more or less pronounced hypoplasia and hypofunction of the sex glands is found in a considerable percentage of schizophrenic cases. In a few cases he tried transplantation of ovaries in treatment of schizophrenia. In one case he obtained no results. Three subjects improved to a surprising extent.

Tsubura¹⁷ in 1923 reported that individuals without gonads showed a lowered tolerance for sugar and that if these individuals were given sub-cutaneous injections of either adrenalin or pituitrin, a marked hyperglycemia followed. He also found that if gonads were transplanted into these individuals the above conditions were eliminated. Walker¹⁸ states that the pituitary and adrenals are most important in the determination of the sex characteristics, and that the interstitial cells of the gonads are trophic rather than secretory. The following year (1925), Korenshevsky¹⁹ reported that 60 per cent. of castrated individuals became obese, while the remaining 40 per cent. are usually thin. He found that in these cases the nitrogen metabolism is decreased. Lipschutz²⁰ states that the morphological and physiological changes which follow absence or deficiency of the gonads vary according to the age at which the deficit arose. He found that the thyroid of the hypogonad subject was usually small, and that the hypophysis was larger and heavier than in normal individuals.

In order to prove whether the ovaries play a part in schizophrenia, Potzl and Wagner²¹ removed the adnexa in two cases of long standing. Fibrosis, such as described by Fraenkel in the testes of male schizophrenics, formed in the ovaries. Hypothetically, a delay in the retrogression of the corpora lutea may be assumed as a manifestation of injury to the genital glands in female schizophrenics, they state, which is to a certain extent comparable to a pregnancy action. They had no favourable results from castration combined with homeoplastic ovarian grafts in schizophrenic women. They attribute the menstrual aggravation to increased permeability of the meninges during these periods.

Gibbs²² found that some disturbance of lipid metabolism may occur in schizophrenia and may involve the suprarenal cortex as suggested by the following:

- (a) Previous observations on the sexual development and behaviour of these patients.
- (b) The evidence that the suprarenal cortex is involved in these disturbances of sexual development.
- (c) The evidence that the suprarenal has both an embryologic and functional relation to the gonads on the one hand and to the brain on the other.
- (d) Substances of a lipid nature play an essential part in the functional metabolism of each of these organs.
- (e) The female sex hormone and the vitamine for reproduction are both of a lipid nature.
- (f) The low basal metabolism rate frequently observed in schizophrenia suggests an involvement of the suprarenals.

He also found that in many patients with schizophrenia the blood cholesterol was unusually low, and may be more directly correlated with the psychosis and with sex than with any other recognised factor.

Munzer described in detail the case of a man of 25 years who quite suddenly developed a schizophrenic state with delusions, chiefly in the sexual sphere, and after three months committed suicide. The chief gross post-mortem changes consisted of enlargement of the thymus which weighed 50 grams and showed marked increase in the number and size of Hassall's corpuscles; enlargement of the spleen and of the lymph follicles of the tongue and small intestines. The testis weighed 32 grams and showed marked atrophy and degeneration with abundant Lubarsch-Charcot crystals. The adrenals weighed 17 grams with rather hypertrophic cortex and persistent undifferentiated cells of the zona glomerulosa.

of the cortex. There was reduction of the islands of the pancreas, and the thyroid presented a polymorphic picture with good evidence of function, even hyperfunction, but also degenerated foci resembling those seen in idiots and cretins. One of the parathyroids lay within the thyroid, there was diminution of eosinophile cells and on the whole, these glands had preserved the characters seen in children. There was an apparent increase in the eosinophilic cells in the hypophysis and an adenoma-like formation. Munzer maintains that abnormalities of the endocrines are constant in this psychosis.

One of the most complete studies is by Langfeldt,²⁴ who reports a detailed clinical examination of 40 unquestionable cases of schizophrenia. He used every known diagnostic test of any value. His cases fell into three groups: 16 catatonics, 11 hebephrenics and 13 mixed. In the catatonic group he found the following essential disturbances present in both the acute and the quiescent cases:—slow pulse, low blood pressure, lymphocytosis, glandular swelling, positive pilocarpin, positive Aschner reflex (vagotonic disposition), reduced basal metabolism. In the acute cases he noted also certain sympathetic signs such as dilated pupils, tachycardia, exophthalmos and reduced glucose tolerance. In the hebephrenic cases, in the acute as well as in the chronic phases, only sympathetic symptoms were found: tachycardia, exophthalmos, tremor, dilated pupils and reduced glucose tolerance. These symptoms were, however, found most pronounced in the acute phases. In the schizophrenics he also found large firm testes.

A STUDY OF EUNUCHS.

Finally, it may be of interest to mention the findings of James L. MacCarthy, who in China in 1925-1927 examined twenty Chinese eunuchs abandoned after the dissolution of the Imperial Court in Peking, and three Skopees driven from Russia and taking refuge in China. The former type of eunuchs has been known in China as long as history and were used as servants in the Imperial Palace. Many of these were castrated in youth and were completely deprived of external genitals.²⁵ The Skopees were castrated because of their religious teachings, and it is said that there were at least 150,000 members of this sect before the intolerance of the Soviet scattered them out of Siberia. This sect has been in existence since 1757, and many of the subjects were castrated in childhood. Two of the Skopees examined had their external genitals completely removed, while the third had only been castrated. All of the twenty-three eunuchs examined showed certain general characteristics: 15 tended to be obese, and 8 were emaciated, probably due to starvation. The larynx was infantile. The extremities were proportionately larger than normal. In

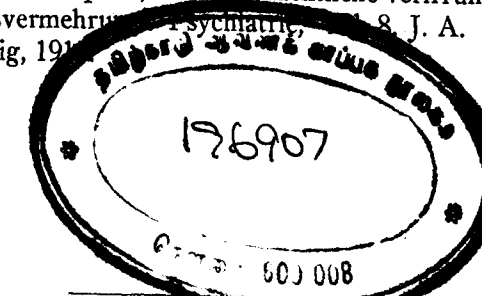
all cases it was found that the body height: leg length ration was 1.75, whereas in an equal number of normal individuals it was 2.0. The pelvis was juvenile. There was an acrocyanosis and the nails were spotted. Several showed a rather general cyanosis of the body, while the remainder were very pale. The skin was clammy, rather puffy, doughy and creased. The subcutaneous fat in the gluteal region under the breasts, in the trochanters, abdominal wall and especially under the mons veneris was more abundant than in normal men. The middle of the upper lip, the submental skin, the cheeks and the upper part of the neck were hairless. The perineum, axillae and extremities did not have the abundant hair that is commonly found in the normal male. The pubic hair line was horizontal, or, in two or three of the individuals, concave.

Psychologically, these individuals were found to all have good intelligence, were all orientated, but had been living a hand-to-mouth existence since they had been thrown on their own resources. They all appeared very introspective and apathetic. Although they could talk quite intelligently when questioned, they never volunteered any information and appeared very stupid. They seemed methodical in their actions and only two showed any purposeful efforts. There was a distinct lack of affect: they were cold and passive, although in dire straits financially. At least half of the eunuchs had got into trouble because of their tempers, and two had been sentenced because of murder. They all appeared moody. Most of the eunuchs who still retained the penis stated that they had often indulged in sexual intercourse with prostitutes although they had found that their erections were always of short duration. They all said that they indulged in homosexual practices and other perversions. Ten of them had had gonorrhoea and one of them had an active chancre. No blood examinations or basal metabolism tests could be made on these subjects, but Shen and Lin²⁶ have reported the nitrogen metabolism of eunuchs examined by them and it conforms to the general picture. The examination of these eunuchs showed them to be almost typical prototypes of what is considered "dementia praecox".

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THE PROPHYLAXIS OF TYPHUS FEVER AND VACCINATION AGAINST THAT DISEASE.*

BY

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INTRODUCTION.

The persistence of typhus fever endemicity after the huge epidemics which occurred at the end of the war in Eastern Europe and even its increased prevalence in the last few years, not only in Europe, but in several countries of Africa and South America, as a result of the economic depression, have focussed once more the attention of the health authorities on typhus and made it clear that the classical measures of delousing during epidemic outbreaks were incapable of bringing about an eradication of the disease in areas where it is endemic. The realisation of this shortcoming of the standard measures has induced fresh researches regarding the epidemiology of typhus fever, the results of which have thrown considerable light on the problem. The facts revealed by these researches are essentially:

The existence during the epidemics, apart from obvious cases of typhus, of atypical or sub-clinical cases, or, indeed, of individuals with latent infection;¹

The persistence in certain cases of the infection without symptoms for several months after the disease;²

Finally, the appearance or reappearance of the disease after years of latency in a certain proportion of individuals.³

These three types of observations corroborate each other. They permit us to consider typhus as a premunising infection—that is to say, one in which immunity depends on the presence of the germ in the body. This new conception of typhus infection makes it easy to understand that, owing to insufficient feeding or excessive fatigue, the immunity balance of an individual formerly infected with typhus may be upset. The virus liberated invades the blood stream, induces the symptoms of the disease and may transmit infection to the lice carried by the individual. This explains the reviviscence, apparently spontaneous, of

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¹ Even if these individuals do not transmit the infection to the lice which they carry, their blood proves virulent when inoculated to the guinea-pig or to man, which shows that it does contain typhus virus.

² This is the interpretation given by ZINSSER of the cases of Brill's disease observed in the large cities of the United States in individuals born in those parts of Europe where typhus is endemic.

old typhus foci in places where the population remains infested with lice in spite of the disappearance of the disease during the inter-epidemic period.

The obvious theoretical conclusion to be drawn from these observations is that the population must be kept free from lice in order to render harmless the reappearance in that population of typhus virus.³ This freedom from lice would have the further advantage of bringing about the eradication of relapsing fever as well as that of typhus fever.

Unfortunately, while the classical measures of delousing succeed in temporarily ridding the populations stricken by an epidemic from their parasites and their typhus, they do not succeed in protecting them against a more or less rapid return of their louse infestation with its attendant risk of typhus revival.

This infestation is evidently related to complex social and economic conditions which cannot be modified without considerable efforts and expenditure and are in many cases beyond the resources of the authorities. In these cases, a safe and effective method of typhus vaccination would be of major practical value to the sanitary authorities in their fight against typhus.

As *Rickettsia prowaseki* cannot be grown on ordinary culture media, the preparation of a vaccine for typhus presents unusual difficulties. The first attempts to use as an antigen the killed germs contained in infected organs failed, probably owing to their insufficient concentration. Attempts to attenuate these germs in organs also met with failure. WEIGL, culturing *Rickettsia* in the intestines of lice, was the first to succeed in obtaining them in sufficient quantities to induce immunity in man with killed germs. Unfortunately, the delicate techniques required to inoculate lice *per anum* and for emulsifying their gut content at the height of *Rickettsia* development makes this method expensive and applicable therefore for the preparation of vaccine for individuals or groups of persons more particularly exposed to typhus infection, but not for the whole population of endemic areas.

More recently, progress in the knowledge of the relationships between typhus and typhus-like diseases and the cross-immunity between them opened a new avenue of approach to the solution of the problem. The virus of murine typhus, which inoculated to man produces only a transient fever with comparatively light nervous symptoms and exanthema, proved nevertheless capable of inducing a strong immunity to both the murine and the classical forms of typhus. BLANC, by submitting to the action of ox bile the organs of

³ This is the case in the American cities where the late relapses of typhus (Brill's disease) are not followed by secondary cases, owing to the absence of lice to ensure transmission.

guinea-pigs infected with murine typhus, succeeded in rendering the virus they contained incapable of producing symptoms when inoculated to man. Later, LAIGRET obtained a similar result by emulsifying a similar virus with a mixture of egg-yolk and olive oil.

While large-scale vaccinations were carried out with these live murine typhus vaccines in Morocco and Tunisia, ZINSSER and CASTANEDA were testing in Mexico the effects of a killed vaccine prepared from emulsions of *Rickettsia* developed on the *tunica vaginalis* of infected rats, the resistance of which was diminished by various artificial means. But here again the delicate character of the technique prevented large-scale application of the method. An indirect way was taken to obtain an immunity (indeed transitory) in man by the use of serum of horses hyperimmunised with the germs obtained from the rats.

Another method of obtaining large amounts of *Rickettsia* for vaccine making was found to be tissue culture. Although nearly every type of *Rickettsia* has been successfully grown in tissue culture and also in the cells of live chick embryos inoculated according to the technique of GOODPASTURE or LI & RIVERS, and although these two methods have certain theoretical advantages, they have not yet passed the experimental stage, nor have they been actually used in practice for vaccine preparation.

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Such was, very roughly, the position with regard to typhus prophylaxis generally and vaccination in particular when, following an alarm concerning the presence of typhus among the fighting forces in Madrid, the Spanish Government asked the League for technical advice regarding measures of protection against the disease.

A mission was sent to Spain including Surgeon-General LASNET, formerly Director of the Health Services of Algeria and of the French Colonial Medical Service—assisted by Dr. J. LAIGRET, of the Pasteur Institute at Tunis, the author of a method of typhus

vaccination—and Dr. C. WROCZYNSKI, formerly Director-General of Public Health in Poland, both of whom have had considerable experience in the administrative control of typhus. The mission found that there was apparently no typhus in Spain, but that a definite menace existed owing to the louse infestation of troops, the large number of refugees and the possibilities of the virus being brought into Spain from infected countries.

Before formulating technical advice to the Spanish Government with regard to measures to be taken, the Health Committee considered it necessary to convene experts who could give them the benefit of the most recent developments of scientific knowledge regarding typhus prophylaxis. It was fortunate enough to obtain the presence, at this consultation, of all the inventors of existing methods of typhus vaccination: Professor WEIGL, Professor ZINSSER, Dr. BLANC and Dr. LAIGRET—and also experts who had been closely watching, in their own countries, practical applications of each method; Professor ANIGSTEIN—himself the author of a method of vaccination against tropical typhus—for Weigl's vaccine in Poland, Professors MOOSER and VARELA for Zinsser's vaccine in Mexico, Dr. BONJEAN for Blanc's vaccine in Morocco, Professor SUAREZ for both Zinsser's and Blanc's vaccines in Chile.

Professors Ed. SERGENT and CIUCA, who have had considerable experience of typhus and typhus research in Algeria and Roumania respectively, without being directly associated with any of the vaccination methods proposed, and Dr. M. T. MORGAN, of the Ministry of Health in London, presided over the meetings of the consultation. They were held on the 8th, 9th and 10th of February in Geneva. Besides the experts mentioned, the meetings were attended by representatives of the Ministry of Public Health of Spain and by members of the Health Committee.

(To be continued)

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AUTOSERUM TREATMENT OF OPIUM ADDICTION.

BY

W. B. WENG, M.B.B.S.

There are more opium addicts in China than in any other part of the world. This evil habit, comparatively speaking, is not many centuries old, and was acquired from outside sources. Genuine national attempts have been made from time to time to put an end to the habit by suppressing traffic in opium, and it is a matter of history that one of these attempts by the Chinese Government led to the outbreak of the well-known opium war in the last century. After the Russo-Japanese war, there was a remarkable reaction for the good in China, and everywhere there was a cry for reform, and an almost effective attempt was made for the suppression of traffic in opium. Recently, the Chinese Government showed its earnestness by taking the extreme, drastic measure that death penalty would be awarded to those who persisted in consuming opium in contravention of the Government anti-opium law.

As the Chinese Government have made and are making earnest attempts to stop the evil, so the large mass of opium addicts have made and are making serious efforts to eradicate the habit among themselves. The symptoms, however, that accompany sudden withdrawal such as restlessness, sleeplessness, incapacity to do physical or mental work, diarrhoea, anorexia, sneezing, etc., are so distressing that the efforts fail. Several opium habit cures have been prescribed, and tried, but many of them have been proved in the end to be not helpful. Even the few that gained temporary popularity have now been consigned to the limbo of forgotten things.

There appeared about the end of last year an abstract of an article on 'Autogenous serum Treatment of Narcotic Addiction' by D. M. Black that had originally been contributed to the August 1937 number of the Canadian Medical Association Journal on the favourable results obtained from the treatment of opium addicts with injection of autoserum. Subsequently one or two other favourable reports appeared.

When I read these I wondered whether they would not be like the several cures the efficacy of which had been extolled before, and so I was sceptic about the results. However, I decided to try this method. In all, up to the time of writing, I tried on ten cases, and give the results below.

As the name suggests, the therapy consists in drawing serous fluid from a blister raised on the patient's own skin by applying irritant plaster and injecting the fluid into him hypodermically. The quantity used is about 10 c.c. each time. The total

number of injections I gave to each patient varied from three to six. The following are the cases.

C.W.M., male, aged 45, occupation shop-keeper, contracted chandu (opium) smoking habit when he was twenty years old. From the quantities of chandu he told me he had been smoking, I calculated that the morphia therein must be about 20 grains daily. He had attempted several times before to stop the habit, and had taken several cures, but all had failed. He was not taking any other drug or alcohol. A hypodermic injection of 10 c.c. blister fluid was given on the first day. He was allowed to smoke half the quantity of opium on the same day, quarter of it on the second day and one-eighth on the third. On the fourth day it was completely stopped. On the first day he felt not very comfortable but he had a good sleep. On the second, he felt not quite so well as on the previous day but his sleep was not disturbed. On the third, condition was same as on the second. On the fourth, when the drug was completely stopped, he had no sleep whatsoever. On this day a second blister fluid of 10 c.c. was given. On the fifth day he wanted at least quarter of the daily quantity of chandu he had been smoking, but when told that he had better try his best to forego he did not complain. He, however, could not sleep that night, and so he was given sleeping draught. On the following two days also he wanted to smoke but was not allowed, and sleeping draughts had to be given. On the seventh day 10 c.c. of serous fluid was again administered. After this, he said he had not much desire for smoking, but felt very weak. He had again to be given sleeping draught that night, and on the following two nights as well. On the tenth, another injection of 10 c.c. fluid was given, and, on this night he had a fairly good sleep without the aid of sleeping draught. On the following three nights he slept progressively better. The fifth injection of 10 c.c. was given, and on this night he slept well, and said that he had no longer any desire for the drug, and that he felt all right. To make sure that there was no relapse he was given the sixth injection of 10 c.c. Three days later, that is, on the 18th day, the treatment was stopped. For six months he was not smoking at all. But his wife told me that he had started to smoke three months after the treatment, but that the quantity was about half he had been used to before the treatment.

W.N.S., aged 36, school teacher, acquired the habit when he was twenty-two years old. The daily morphia contained in the chandu that he had been smoking must be about 15 grains. He was accustomed to occasional taking of alcohol, in addition. This was the first time he had sought a cure of the habit. It will be noted from the first case that the desire for the smoking was strong during the first few days. I thought that if one passed the initial

difficulty during these days, then it would be easy later. Instead of progressively reducing the quantity of chandu as I did on the first case, I did not give chandu at all in this case, but gave him whisky for the first three days. He was not very comfortable during the first three days, but slept fairly well. The injection of 10 c.c. was given on the first and repeated three days later. On the fourth day the quantity of alcohol was reduced to half, and was further reduced on the following two days. The third injection of 10 c.c. blister fluid was given three days later. After this he said he had not much desire for chandu, but would like to be allowed alcohol daily. This, however, was not given, and for three days when alcohol was withheld he did not sleep well. After the fourth injection of 10 c.c. fluid, he said he had not much desire for alcohol and slept fairly well. The fourth, fifth and sixth injections of 10 c.c. fluid were given at an interval of three days. All these days he slept well and felt quite all right. I found the patient very intelligent and had a fairly strong will power. For one month after the treatment was stopped, he was not smoking opium or taking alcohol, but thereafter he started to take the latter only and has been doing so since then in moderate quantities. Which is the lesser of the two evils opinions will differ.

T. W. N., aged 28, shop-keeper, chandu smoking habit for five years. Amount of morphia contained in the daily chandu worked out roughly at 5 grains. At the suggestion of a friend, a medical man, the patient was given for the first few days Dionin gr. 1/4 t.d.s. to tide over the difficulties, instead of chandu in gradually reduced quantities or alcohol as in the first and second cases respectively. After the second injection of 10 c.c. fluid he said the desire for chandu was very much less. After the third injection he had no desire at all. After the fourth injection, he said he felt all right, and as he wished to leave the town, treatment had to be stopped. The injections were given at intervals of three days as in previous cases. It is now seven months, and he has told me several times

that he has not been smoking or taking alcohol or anything else as a substitute.

The remaining seven cases were all below thirty years of age. The daily quantities of morphia worked out roughly in each patient ranged between two to five grains. The duration of the habit ranged between two to five years. All were well-fed and were employed, and belonged to respectable middle class families. Dionin grain 1/4 t.d.s. was given as a routine in all cases to overcome difficulties experienced during the first few days. The number of blister fluid injections of 10 c.c. every three days for each patient varied from four to six. The duration of treatment was twelve to eighteen days. Three patients said, at the end of the treatment, that they had not the least desire for chandu, but a week after the treatment was stopped they took to opium smoking again. The other four cases have, according to the reports received, not resorted to chandu smoking so far, and the periods of this freedom vary from five to seven months.

The total number of apparent cures is six, out of ten. Those, in whom the duration of the habit of smoking was the shortest and whose daily quantity of chandu smoked was the least, responded to the treatment more readily than others. The initial difficulties experienced on account of withholding of chandu were less, and the difficulties in respect of sleep too were less.

It is too soon to say whether the six patients who are cured will not take to chandu smoking again or will not take some other narcotic or alcohol as substitutes. The number of cases on which the treatment has been tried is too small to express an opinion. But I am inclined to think that in the six cases that have been cured the duration of the freedom of the habit since the treatment was stopped has been very much longer than from other cures I have tried, that the percentage of cures is greater, and that the initial difficulties experienced by the patients as the result of withholding of chandu during the first few days are very much less.

The Malayan Medical Journal

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LATENT GONORRHOEA.

In a particular case of gonorrhoea, there is absolutely no sign of urethral discharge and of pus in the morning urine for a period of, say, a month after treatment has been suspended or stopped. At this stage, it is not unusual for the patient to ask his doctor whether he has been cured of the infection completely and whether he may resume normal life, especially coitus. It is well-known that the mere disappearance of the discharge and the pus is no criterion that the patient has been completely cured of his gonorrhoea and that such 'cured' cases often relapse. There are cases on record in which the original gonococcal infections flared up, after the patients had had absence of clinical signs and symptoms extending over periods as long as twenty to thirty years. Fraser and Dye¹ have recently published report of a patient who, following prostatectomy, had a recurrence of the original gonorrhoeal urethritis from which he had suffered fifty years previously. The fact is that, in these cases, the treatment has helped to create only a cessation of clinical signs and symptoms while the gonococci remain dormant or in a subclinical condition in one or more than one of the side tracts branching off from the genito-urinary tract, only to flare up later, when conditions favourable for such recurrence arise. Chronic or recurring infection of the prostate may persist and may be difficult to eradicate. A careful examination of the prostatic secretion should be made. A preliminary massage of the prostate may yield only a few pus cells, but repeated attempts may reveal the presence of the infecting gonococcus.

In regard to the relative merits of the three recognised methods of verification of the clinical diagnosis, namely, microscopic, cultural and serological, it is generally conceded that for accurate determination the serological test is the most reliable, the cultural and microscopic coming second and third in order. In chronic cases of gonorrhoea when secondary infection has changed the picture, the uses of the microscopic

test are very limited. Goodhart² regards that Gram-negative cocci other than gonococci to be such frequent inhabitants of the uro-genital tract as to make the diagnosis by film alone highly dangerous. As for the cultural method, he proceeds to state that most workers who had investigated them carefully had found a number of 'pseudo-gonococci', and that it was often difficult to make an accurate diagnosis of gonococcal infection by culture alone. Although complement-fixation test is comparatively more reliable than the other two, Dukes³ says that a negative result does not exclude the possibility of gonorrhoea.

When the tests are not accurate, what is the standard by which one could say that a cure of gonorrhoea has been effected? Dukes further states that the serological test could not be regarded as a substitute for other methods of deciding when a case has been cured, and that its evidence should always be supported by the results of both films and culture. He also quotes the suggestion of Price that, if the patient showed no clinical signs or pathological evidence of the disease, normal life, with the single exception of coitus, should be allowed for one month. Then the patient should be re-examined and all the three tests repeated. If they still yielded negative results, a further month of normal life should be allowed before final tests were made. When these were found satisfactory, the patient might be regarded as cured.

It is well-known that women may have acute or chronic gonococcal infection of the genito-urinary tract, and yet may not be aware of this condition. The fact that discharges due to pathological causes other than gonorrhoea come from the vagina makes it difficult to tell whether there is gonorrhoea or not from naked eye examination only, at least to the extent that is possible to do in the case of men. In women, although the test for cure is more difficult, it should proceed along the same lines as for men. A careful

¹ Fraser, C. K., and Dye, W. J. P., Journal of the American Medical Association, July 27, 1935.

² At the tenth annual meeting of the Association of clinical pathologists held on January 30, 1937 reported by Lancet, February 13, 1937.

³ Vide 2.

search for the residual infection must be made. Such a residual infection may be found especially in Skene's ducts or in Bartholin glands in the former of which chronic infections are more persistent than elsewhere in the female genital tract. Rorke⁴ states that, before one considers a patient cured after treatment for gonorrhoea, the films and cultures should be negative after three succeeding menstrual periods. She must be free from signs or symptoms of gonorrhoea and must have been off treatment for three or four weeks wholly, before final testing after a provocative. The best provocative is alcohol, gin or other spirit given the night before the films and cultures are taken in the morning. The local congestion resulting from the use of alcohol will astonish many practitioners. If this provocative is not possible, painting the urethra, vagina and cervix with a 25 per cent. solution of protein silver and taking films and cultures thirty-six hours later make quite a fair substitute. The blood complement fixation test should also be made and be negative. Should it be positive, even if films and cultures are negative, it is necessary to consider the possibility of a focus of infection elsewhere. By the way she adds that if the patient's "cure" is to be other than a mockery, it must be ensured that the husband or consort is clear of infection before the patient resumes relationships.

In some cases of gonorrhoea, a morning drop may continue to appear months after treatment has been stopped, and two glass tests continue to reveal numerous shreds for years. So long as repeated film, cultural and complement-fixation test performed in the manner described above do not disclose gonococci, they are of little significance. The morning drop may be merely a sign of urethral irritation due to vigorous stripping of the urethra. The urinary shreds are often casts of prostatic ducts, and there may not be any possibility of gonococcal organisms lying dormant and the infection flaring up later. In some instances of post gonorrhoeal prostatitis pus can be expressed by massage for months or even years after the acute stage. To the question for how long a period must one interdict sexual intercourse in such a case, the answer⁵ is given that whether or not sexual intercourse is permitted in this kind of a case depends entirely on the bacteriology of the fluid. If recent examinations for gonococci are negative and the smears and cultures are negative, there is no reason why the patient may not indulge. The fact that the patient has pus does not prevent sexual intercourse. When one gives permission, one must be sure that there are no organisms in the strippings.

⁴ Rorke, Margaret, Practitioner, August 1936.

⁵ Journal of the American Medical Association, December 5, 1936, P. 1913.

HEAT AND SWEATING.

At an estimated cost of £100-150 one could work and sleep in an air conditioned cubicle under climatic conditions so regulated as to produce those which are most suitable to one, according to a report of this cubicle.¹ In the cubicle, ventilation, insulation and air-condition difficulties have been overcome. The insulation against radiant heat is carried out by means of aluminium foil, which method is new and economical. It is easy of transport, reasonable in cost and works off an ordinary electric supply and does not appear to use much current in excess of the ordinary domestic refrigerator. The cubicle is about the size of a ship's cabin. The work has been done at the School of Hygiene, London, and, according to the report, a room can be seen there in which the climatic conditions of the tropics can be reproduced. It would be a great blessing to those in the tropics, where it will be possible to work and sleep under climatic conditions similar to those of temperate regions, and thus reduce to a great extent the difficulties incidental to living under the tropical sun.

Drinker² in a paper on the effects of heat and humidity upon the human body, refers to the physiologic aspects of heat—high temperature for short periods and also for long periods as in the tropics. Sweat is an important element concerned in body response to high temperatures and contains from 0.1 to 0.5 per cent. of sodium chloride. Since the daily quantity of sweat produced as the result of high temperature is about 7.5 litres, the total loss of salt entailed daily would be about 22.5 gm. Deducting from this 12 gm. of salt that is excreted from the body, there is still a loss of 10.5, and this must be made up, in order to restore normal salt-water ratio, as rapidly as possible, by means of additional intake of salt by oral or other means. The daily intake of salt should be at least 15 gm. Drinker proceeds to refer to the effects of prolonged residence of people from temperate regions residing in the tropics. Fertility appears to be reduced both sexes being affected. A slight decrease in pulse rate and in systolic blood pressure is the rule but the changes are relatively insignificant. Respiration tends to decrease in rate and the minute volume is somewhat higher. A slight alkalosis has been reported. Blood sugar is apt to be low and non-protein nitrogen has been reported from Australia to be increased. There is also a reduction of total phosphorus in the blood. Red cells are increased and white cells decreased. On the credit side are put down increase of height that is apparently attained more readily

¹ The report of the Ross Institute Industrial Advisory Committee.

² Drinker, C. K., J. Indust. Hyg. & Toxicol., October 1936.

than in the temperate regions and comparative absence of fatness. While on the subject of fatness, a reference may be made to opinions on the subject of loss of weight, as a result of sweating, though not in the tropics but under identical conditions for short periods such as exist in hot and deep mines in temperate regions. There was an exchange of views on this subject at a meeting³ of mining engineers, in England, where Whitehouse stated that one of his subjects, a medical student, while down in the mine, showed a loss of weight of very nearly five pounds an hour. Throughout the experiments the subjects had seemed to be more comfortable when working than when at rest, although from the mouth temperature and the pulse rate the reverse would rather be expected. Whitehouse suggested that this might to some extent be a psychological matter, because to sit still in an experimental chamber for hours on end is rather depressing. He added that he himself, when down in the mine, lost five pounds in three hours, but that he had always got the whole of the weight back after dinner in the evening. One curious circumstance was that the men lost the greatest amount of weight by sweating after the week end rest. The man who lost ten pounds on Monday would lose about nine pounds on Tuesday and progressively less until Friday, when his loss might be only five pounds, but by the following Monday the heavy figures were again recorded. Drinker added that a tall thin type of person is perhaps best suited for tropical residence, having a maximum surface for heat loss in relation to body weight.

Abnormalities like excessive, reduced and rancid, foul smelling sweating which is common and the rare total suppression of sweating—general or local—may be due to interference in the nervous supply, changes in the sweat glands and even to hysteria as reported recently by Berkman and Harton.⁴ White⁵ states that human hands and feet, like the ears of the rabbit, have the specialised function of regulating body heat and quotes authors who have shown that when the governing centre of this mechanism is destroyed by injuries in the floor of the third ventricle, the capacity to regulate body temperature is lost. When the normal individual is hot, vasodilation permits the loss of excess heat by radiation, whereas in the cold vasoconstriction prevents this. In states of emotional excitement the sympathetic nerves likewise constrict the superficial vessels and one develops 'cold feet' and cold clammy hands. There are some people who assert that even in the hottest part of the day they

³ Annual meeting of the Institute of Mining Engineers, reported by British Medical Journal, February, 27, 1937.

⁴ Berkman, J.M., and Harton, B. T., Proc. Mayo Clinic, March 17, 1937.

⁵ White, C. James, Journal of the American Medical Association, August 1, 1936.

cannot perspire. Closer investigation of these cases would show that the secretion is present though reduced. Fog⁶ refers to the rare case of a man in whom there was total absence of sweating. He was twenty seven years old, and until a long febrile illness (paratyphoid fever) six years prior to the examination had had normal sweat secretion. He complained of extremely distressing symptoms under circumstances in which sweat secretion normally takes place. By means of a series of pharmacologic and physical tests the author verified the patient's statement that he could not perspire. A biopsy from the skin showed that about one half of the sweat glands were present while the other half had undergone degeneration. By means of a number of muscular activity experiments it was determined that during increased heat production in the body the patient's heat regulation was normal but that signs of circulatory insufficiency arose which must be ascribed to extreme vascular dilatation in the skin. This forms the basis for a compensating, excessive, loss of heat through conduction and radiation. Continued observations of the patient during two years and a half showed that the symptoms remain unchanged. Berkman and Harton, already referred to, give the history of a woman thirty-six years old of having been intolerant to heat since the age of eleven years. From that time until she reached the age of twenty-six years, it had been necessary for her to live in the basement of her home during the severe heat of the summer. For twenty-five years she had become dyspnoeic and unable to walk because of weakness, whenever the temperature reached 85° F. She could not prepare food over the stove. Routine general examination revealed the patient to be in good general condition and routine laboratory determinations revealed nothing abnormal. Tests of ability to sweat were applied and the results were that sweating was noticeable only in certain parts of the body or when it was general, it was only light, while in normal persons the same tests would have produced profuse secretion. She was asked to come to the clinic when weather was hot and uncomfortable which she did. The tests were repeated. Two grains of desiccated thyroid were given daily to elevate the basal metabolic rate, and if possible, to induce sweating. On the third or fourth day of the administration the woman was seen in one of her attacks in which she was unable to walk at a normal rate. The walk alone suggested hysteria. It was suggested to her that she sit outdoors in the hot sun without her hat and try to prevent the occurrence of any anxiety or fear. She was told also that they doubted very much whether she would experience any of the symptoms she had had in the past. At the end of one hour, although

⁶ Fog, Mogens, Journal of the American Medical Association, December 1936.

she was slightly upset nervously, mortification was by far the outstanding symptom. She sat in the sun on three successive days and on the last day she remained in the sun for two hours. At the end of that time she was literally drenched with perspiration. This had not been noticed on the previous days. The authors heard from this patient on several occasions since that time. She has had no difficulty whatsoever since, although she has been exposed to the sun on days in which the temperature has been above 110° F.

It is difficult to treat general, abnormally excessive sweating accompanied by rancid or foul smelling odour. Atropine and belladonna are not very helpful. 'Stimulating baths, cold needle baths, alum, salt or alcohol baths' and 'strychnine in stimulating dosage' have been recommended by a writer⁷ as being often helpful. A series of interesting studies on the various aspects of sweating has been made by Japanese workers,⁸ and one of these is by Ichihashi on 'The effect of drugs on sweat glands by cataphoresis and an effective method for suppression of local sweating'. He used repeated applications of formaldehyde by cataphoresis for the treatment of hyperhidrosis, and states that this was attended with great success in

thirteen patients suffering from excessive hyperhidrosis of the palms and soles, seven suffering from hyperhidrosis of the axilla and fifteen who suffered from osmidrosis. It was especially successful in the case of palmar hyperhidrosis. A treatment consisting of three or four cataphoretic applications stopped the suffering entirely for at least one and one-half months, sometimes longer than two months. But strong hornification of the skin, followed by desquamation, occurred in the treated region of the skin. In the axilla, a strong application, such as to cause desquamation, could not be used. But the hyperhidrotic suffering could be cured for about one month or longer by a series of applications. In osmidrosis, this treatment was less successful so that a good effect could be expected for only two or three weeks. This was probably because suppression of the generation of the odour was possible only as long as the secretion was entirely stopped. On the palms and soles, a 7.5 to 10 per cent. solution of formaldehyde will be cataphorized with a current of one-third to one-half milliampere per square centimeter of skin for ten minutes. For the axilla, the solution should be from 5 to 7.5 per cent., and the current from one-fourth to one-third milliampere per square centimeter of skin for five minutes. The anode should be applied to the regions to be treated and the cathode to some indifferent part of the skin. These procedures should be repeated three or four times at intervals of about two days.

⁷ Journal of the American Medical Association, April 17, 1937, page 1361.

⁸ Journal of Oriental Medicine, December, 1936.

Reviews.

Modern Treatment in General Practice (Vol. III).

By Cecil P. G. Wakeley, D.Sc., F.R.C.S., F.R.S.E., Pp. 436 with 54 figs., size 6 × 8¾, price 10/6, Bailliere Tindall and Cox, 7 and 8, Henrietta Street, London, W.C. 2, Sole Agents in India and the East Butterworth & Co. (India), Ltd., Avenue House, Chowringhee Square, Calcutta, Rs. 7, 1937.

A series of articles that originally appeared in the well-known London weekly journal, The Medical Press and Circular have been republished in book form in three volumes under the editorship of Dr. Cecil P. G. Wakeley, D.Sc., F.R.C.S., F.R.S.E., who is also the editor of the weekly journal. The first volume was originally tentatively published but the great support which the medical profession throughout the British Empire extended to it encouraged the publishers to bring out subsequently Vol. II, and now Vol. III has been issued. The articles are from various authors and have been carefully planned and selected and are so designed as to be of use to general medical practitioners. Therefore, they deal mainly with diagnosis and treatment which are what the general practitioner requires most. Many of the articles have been written by writers who occupy high positions in hospitals and are specialists in these subjects, and therefore may be taken as having passed the rigid, practical test of hospital experience before appearing in print. They present modern and generally accepted methods of medical and surgical treatment and their application in general practice in a most readable, instructive and practical way, and the reader's interest is sustained throughout. There is hardly any page in which the practitioners will not find something that is of great importance and value. A feature of these volumes is that they are well illustrated and the third volume has as many as fifty-four illustrations several of these being half tone on art paper insets. The get up of the book is excellent and the letter press is clear. The general practitioner will find these three volumes a most valuable addition to his books.

Minor Maladies and Their Treatment.

By Leonard Williams, M.D., Seventh Edition, Pp. XIV+440, price 10/6, Bailliere Tindall and Cox, 7 and 8, Henrietta Street, London, W.C. 2, 1937.

The author quotes Sir James Mackenzie as having stated that our present methods of investigation are not sufficiently directed towards the discovery of disease in its early stages, that we are content impatiently to contemplate the full-blown, whereas we

ought to search for buds and tendencies. What are called minor maladies are in many cases these buds and tendencies which blossom later on into serious diseases. When the author first qualified, there were many excellent books dealing with serious diseases; there was, however, none that treated of such simple every day diseases like the common cold, in detail. The author filled up this void by writing this book, and it was first published in October, 1906. That it supplied a real want became evident from the fact that by February, 1907, it had to be reprinted, and that a second edition had to be issued a year later. The edition under review is the seventh, and the total number of times it has been reprinted these over thirty years is six. It has been translated into Spanish and French. These should bear testimony to the fact that there is a distinct necessity among general practitioners for a book of this sort, and William's Minor Maladies and Their Treatment meets the necessity admirably. The volume is not a compilation but bears the stamp of practical experience of the author on every page. He treats of the subject in a suggestive, heterodox way, which, has stood the test of time. Each successive edition had been carefully revised, and in the present edition, some of the material has been transposed and some has been omitted to make room for an entirely new chapter on dietetics owing to the growing interest evinced in the subject. The book is a practical aid to every day practice and gives valuable hints on many matters. It should continue to be of great use to the general practitioners, as it has been in the past.

Wheeler and Jack's Handbook of Medicine.

By John Henderson, M.D., F.R.F.P.S. (Glas.), Tenth Edition, Pp. XVI+703, E. and S. Livingstone, 16 and 17, Teviot Place, Edinburgh, 12/6, Publishers in India and the East, Butterworth & Co. (India), Ltd., Avenue House, Chowringhee Square, Calcutta, Price Rs. 8-8-0, 1937.

This well-known handbook which was first published in 1894 is now in its tenth edition. Apart from the number of editions, the fact that in the course of the past thirty-three years the book has been reprinted as many as six times testifies to its great popularity. To us in Malaya, where there is a large Chinese population, it is of interest to note that the ninth edition was selected by the publication Council of the Chinese Medical Association for translation into Chinese, and that the translation is now on the market in that country. With the march of time and the progress of knowledge, much of the matter in the

previous edition has had to be altered or modified and several additions have had to be made. Some rearrangement has been carried out and many sections have been entirely re-written especially Anaemias and parts of Gastric Disorders. Certain parts like sections on Immunity have been omitted. Tropical diseases are sufficiently treated. We think that in the treatment of septicaemia a passing reference to prontosil, at least to its possibilities, could have been made. The volume is illustrated, some of the illustrations for heart, spinal cord and brain diseases being coloured, and is well-indexed making it easy for ready reference. Owing to the additional matter, the volume has become slightly larger than its predecessor. Yet, it remains essentially a handbook, and not a textbook which naturally is much bulkier and treats the subjects in far greater detail. In six hundred and eighty one pages are packed, in an admirable way, all the essentials of medicine that are of practical value to students and practitioners alike. The volume is one of the best handbooks in the English language, and we have no doubt that its popularity will considerably enhance.

BOOKS RECEIVED.

Medico-Legal Aspects of the Ruxton Case.

By John Glaster, M.D., D.Sc., Barrister-at-Law, Regius Professor of Forensic Medicine, University of Glasgow and James Couper Brash, M.A., M.D., F.R.C.S.Ed., Professor of Anatomy, University of Edinburgh, Pp. XVI + 284, with 172 illustrations, price 21/-, E. and S. Livingstone, 16 and 17, Teviot Place, Edinburgh.

Illustrations of Regional Anatomy.

By E. B. Jamieson, M.D., Senior Demonstrator and Lecturer, Anatomy Department, University, Edinburgh, Second Edition, E. and S. Livingstone, 16 and 17, Teviot Place, Edinburgh, Publishers in India and the East, Butterworth & Co. (India), Ltd., Avenue House, Chowringhee Square, Calcutta.

1. Section 1—Central Nervous System containing 48 plates.

Continued from page 172.

problem of introducing red palm oil into the diet in palatable form requires further investigation.

- (k) The classes in the community which are particularly likely to suffer if their diet is defective are infants and growing children and expectant and nursing mothers.

2. Section II—Head and Neck containing 63 plates.
3. Section III—Abdomen containing 37 plates.
4. Section IV—Pelvis containing 33 plates.
5. Section V—Thorax containing 30 plates.

The Medico-Legal Post-Mortem in India.

By D. P. Lambert, M.D., Ch.B., D.T.M. & H. (Univ. Edin.), Captain, Indian Medical Service, Fellow of the Royal Society of Tropical Medicine and Hygiene, Member of the Medico-Legal Society, Pp. 113, Price 5/-, J. & A. Churchill Ltd., 104, Gloucester Place, Portman Square, London, W.1, 1937.

A Health Survey of the State of Kedah with special reference to rice field malaria, nutrition and water supply.

By W. J. Vickers and J. H. Straham, 1935-1936, \$ 1.50, Kyle, Palmer & Co., Kuala Lumpur, Printers.

The Use of Standard Treatments in the Campaign against Disease in the Tropics.

By J. Neil Leitch, M.D., B.S. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.T.M. & H. (Eng.), F.R.G.S., F.Z.S., Pp. VI + 63, price 6/-, H. K. Lewis & Co., Ltd., 136, Gower Street, London, W.C. 2, from the author.

What to Eat and Why.

By J. Neil Leitch, M.D., B.S. (Lond.), M.R.C.S. (Eng.), L.R.C.F. (Lond.), D.T.M. & H. (Eng.), F.R.G.S., F.Z.S., Pp. XVI + 154, price 1/-, London College of Dietetics, 64, Great Cumberland Place, London, W.1, from the author.

Drug Atlas.

For Students of Pharmacy and Medicine compiled by W. Scarnell Lean, B. Pharm., Ph.C., Longmans, Green & Co., Ltd., 19, Paternoster Row, London, E.C. 4.

Lippincott's Autumn List of New Books, 1937.

- (l) The attention of public health and educational departments is drawn to the value of providing suitable meals and various supplementary foods—e.g., milk—for day school children. It considers that school feeding schemes, carried out with the co-operation of nutrition workers, are among the most important means of combating malnutrition and improving the health and development of growing children.

Current Medical Literature.

MALARIA. By J. W. Field, M.D., Ch.B., (B'ham) Malaria Research Officer: Chapter VI, Division of Malaria Research, Annual Report of the Institute for Medical Research, Federated Malay States, 1936, page 93 to 104.

GENERAL.

The experiments in clinical prophylaxis which were commenced in August, 1935, on behalf of the Malaria Commission of the League of Nations were continued throughout the year. These experiments were designed primarily to afford data regarding the efficacy and safety of atebirin and quinine administered as clinical prophylactics to malarious populations. They were carried out on three plantations with a total Indian labour force averaging approximately one thousand living for the most part under conditions of severe endemic malaria. In the course of these experiments 1,733 individuals were observed for periods up to twelve months, and 1,174 malarial attacks treated. So far as possible a clinical and parasitological 'follow up' was made of every individual. The results are briefly summarised elsewhere in this report.

Therapeutic trials of new malarial remedies on cases of acute malaria admitted to the Government hospital adjoining the Institute were continued. Tests were made of a proprietary remedy 'Malarene' and of samples of quinine sulphate tablets received from the Perak Medical Department. The investigation of the therapeutic value of atebirin-musonat, commenced during 1935, was concluded.

In the course of these tests 505 cases of acute malaria were treated by the staff of the division according to standards which have been defined in previous reports.

The Third International Course in Malariology organised by the Eastern Bureau of the League of Nations, was held in Singapore during the year. For purposes of this course a series of lectures on the chemotherapy of malaria were prepared and practical classes in malarial haematology and protozoology arranged by the staff of the division.

A malarial survey of the Selangor Coast area was started with the co-operation of the Health Officer, Coast, towards the end of the year. This survey is primarily parasitological and is intended to furnish data of the prevalence and distribution of the three species of parasite.

RESEARCH.

I.—Experiments in Clinical Prophylaxis.

The experiments in clinical prophylaxis commenced in 1935 on behalf of the Malaria Commission of the League of Nations were continued throughout the year. The results of the first years working have been submitted in detail to the Commission.

Three plantations, chosen with due regard to the severity of the malaria, and of convenience of access from Kuala Lumpur, were selected for the experiments. These plantations are referred to as Estates 'T', 'Y' and 'U.C'; 'T' is a tea estate, while 'Y' and 'U.C.' are rubber estates.

Clinical Prophylaxis on Estate 'T'.

Estate 'T' is an isolated tract of hilly country completely surrounded by jungle which, for the most part, is low-lying and swampy. It has an area of approximately four hundred acres and was cleared only a few years ago for the planting of tea.

Experimental conditions on this estate were unusually favourable. There was a highly malarious population of

nearly five hundred Indian labourers and their dependents closely grouped in one set of 'lines'; there was free breeding of *A. umbrosus* within a short distance of these 'lines'; while the area was isolated from outside sources of infection by a jungle barrier several miles deep and peopled only by a small wandering tribe of aborigines.

Preliminary surveys had been made in August, 1935. The trophozoite rate of the population was then fifty-nine per cent. and the malarial morbidity exceptionally high*. During the month of September, 1935, the first month for which accurate clinical records are available, sixty-one attacks of malaria occurred among one hundred and fifty-two individuals of an unprotected 'control' group. Four hundred and seventy-seven *A. umbrosus*, of which thirty-one were found on dissection to be infected, were caught in one mosquito-trap during a period of three weeks at the end of August and the beginning of September†. The breeding of *A. umbrosus*, then and throughout the experiment, was completely uncontrolled.

Scheme of Experiment.—The entire labouring population was divided into three groups believed to be in all respects comparable. The first group was given prophylactic atebirin at an adult dosage of 0.2 grammes on successive days twice weekly; the second group received 0.4 grammes of quinine bihydrochloride daily in tablet form; the third group serving for control received a yellow tablet known to be inert.

Effect of Atebrin and Quinine Prophylaxis on the Incidence of Malaria.—The monthly incidence of malarial

* The attitude of the labourer to the sickness which was prevalent on Estate 'T' was an interesting commentary on the health conditions. Most of the sickness we were told, was due to evil spirits living in the shell of an old tree which was a prominent feature of the estate landscape. The labourers were usually attacked as they slept. Pregnant women fell victim, developed fever and aborted. Anaemia among the children was due to the devils which sucked their blood. Misfortune arose from the displeasure of gods or devils who must needs be propitiated by offerings or blood sacrifice.

The writer recalls seeing a pathetic family group gathered before the shrine of Muniandy, counterpart of the goddess Kali. A fowl had been sacrificed before the shrine that Muniandy might spare the life of the woman Seeramah (No. 69) who had been ailing for some time. Offerings of rice, bananas and coconut lay on a primitive altar. The chirpings of a lizard in the palm-leaf roof of the shrine caused general consternation, for Muniandy was displeased and unlikely to stir on Seeramah's behalf. Seeramah had had six attacks of benign tertian malaria within five months while in the second year 'control' group. She was transferred to the 'quinine' group with a hope that Muniandy's intercession might then be unnecessary.

A woman Rasamah (No. 733) was brought to us a few hours after being attacked by a devil while quietly plucking tea in the field. She had felt the approach of the devil and had fallen unconscious. Several women we were told had been similarly attacked at the same spot and there could be no doubt that the 'djin' who lived in the tree close by was offended. Rasamah had had a two months' abortion ten days before and had probably collapsed from exhaustion.

† Periodic larval surveys were made, and trapping, identification and dissection of anopheline mosquitoes done by the Entomologist, Institute for Medical Research. For entomological data from Estate 'T' reference should be made to the Annual Report of the Entomologist (p. 79).

attacks in the three experimental groups are summarised in Table I.

TABLE I.

	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.
Atebrin Group.	18	4	4	2	5	0	1	0	2	1	4	4	63
Quinine "	43	6	11	12	13	6	2	3	6	0	4	19	57
Control .	61	65	2	48	53	34	41	26	25	27	35	15	35

Prophylaxis commenced on 2nd September, 1935, and suspended on 26th August, 1936.

Monthly Malarial Attacks: Estate 'T.'

Effect on Asexual Parasites.—Blood surveys at which thick films were examined from all available members of the population were made at intervals of approximately six weeks. The trophozoite incidence in the three groups at various periods during the experiment is indicated in Table II.

TABLE II.

	12th August, 1935 (prior to prophylaxis).	23/9	4/11	16/12	24/2	4/5	22/6	30/8	12/10
Atebrin Group:									
Adults	..	47	1	0	0	3	0	2	1
Children	..	83	2	5	5	2	0	2	4
Quinine Group:									
Adults	..	60	3	8	6	5	6	12	38
Children	..	97	50	60	42	19	33	20	74
Control:									
Adults	..	40	47	47	31	17	23	25	24
Children	..	71	65	53	68	53	48	24	41

Prophylaxis commenced on 2nd September, 1935, and suspended on 24th August, 1936.

Trophozoite Rates at Surveys: Estate 'T.'

Effect on Gametocytes.—The gametocyte incidence indicated by the blood examinations made at the routine surveys is shown in Tables III and IV. The figures represent number of gametocyte carriers and not gametocyte rates; the three groups comprised approximately equal numbers of individuals.

TABLE III.

	12/8	23/9	4/11	16/12	24/2	4/5	22/6	30/8	12/10
Atebrin Group	..	4	4	1	0	1	0	1	2
Quinine "	..	2	5	2	1	3	0	1	2
Control "	..	2	2	3	4	7	2	8	4

Prophylaxis suspended on 24th August, 1936.

Gametocyte Carriers (*P. falciparum*) at Routine Surveys.

TABLE IV.

	12/8	23/9	4/11	16/12	24/2	4/5	22/6	30/8	12/10
Atebrin Group.	..	16	0	2	0	1	0	1	15
Quinine "	..	21	18	10	10	8	7	6	17
Control "	..	14	25	10	32	11	14	5	22

Prophylaxis suspended on 24th August, 1936.
Gametocyte Carriers (*P. vivax*) at Routine Surveys.

It is of interest that the administration of the prophylactic drugs, and particularly that of atebirin, was associated with a substantial reduction in the source of mosquito infection.

Effects on the Labourers.—The drugs were taken readily by the coolies, though more with a passive acquiescence than with any particular enthusiasm. Despite the high malarial morbidity prevailing in the "controls" and the great reduction in morbidity among those protected with atebirin or quinine, we saw little evidence that the control group was a particularly unpopular one, possibly because the tablet given to the controls for psychological reasons, was inert and therefore entirely free from side effects. We were sometimes told, in fact, that the inert tablet did a great deal of good, an amusing sidelight on the reliability of subjective data.

There were complaints of deafness and tinnitus among the quininised coolies for the first month of administration, but these symptoms, or at least complaints of these symptoms, ceased after a few weeks.

Yellow staining of the conjunctiva, occasionally marked, tended to develop after two or three months administration, and at the end of twelve months about a third of the atebirised labourers could be picked out from their fellows by the yellow tinge to the whites of the eyes. There was no complaint of this discolouration until we started examining eyes and thereby drew attention to the staining.

There were eight deaths of Estate "T" during the prophylactic period of twelve months compared with eighteen deaths in the nine months immediately prior to prophylaxis. Four of these deaths occurred in the atebirin group, two in the quinine group and two among the "controls". The diagnosis in six of these cases was clear, but in two instances detailed below it was not possible from the evidence at our disposal to reach a definite conclusion.

Case 9.—A strong and healthy Tamil male of 35 years celebrated "pay-day" on 6th August, 1936, by getting drunk on "samsu", a potent native spirit distilled from rice. He was brought back to the coolie lines that night singing and shouting and smelling strongly of alcohol. The following morning he was comatose, and in the evening he died. A post-mortem examination made by Dr. Swift in Klang Hospital on the following day did not reveal the cause of death. Histological examination of the liver revealed extensive fatty degeneration. This case had received prophylactic atebirin twice a week for nearly a year.

Case 91.—A Tamil boy of 14 years received prophylactic atebirin from September, 1935, till May, 1936, when the drug was discontinued because the boy was found to be very anæmic. With the exception of six doses of 0.1 grammes in July, no further atebirin was given. In September he was taken to a neighbouring village for native treatment, and died there. Histological examination of the liver showed marked fatty degeneration.

In these two cases we merely cite the facts at our disposal as it would obviously be unjustifiable on the evidence either to exonerate atebirin from blame, or to assume that the drug was wholly or in part a cause of the damage which the liver had sustained. There was no clear-cut issue in either case.

In three instances, all in the atebirin group, there were mental symptoms:

Case 164.—A male Tamil of 25 years who had received prophylactic atebirin for three months suddenly went "off his head" during a period of domestic trouble. He shouted and sang, threw off his clothes and refused food. He was transferred to hospital where he was noisy and obstreperous. A week later he was quiet and sensible and had apparently recovered. The subsequent history is unknown as he left the estate for good shortly after his return.

Case 105.—A male Tamil of 28 years who had received prophylactic atebirin continuously for nine months left the estate in June, 1936, under a sense of grievance at some wage dispute, and was next seen some miles away behaving strangely. He had no money and alcoholic intoxication was not likely. His wife stated that he had never had previous mental trouble. For the next three months he was not seen and his whereabouts were unknown. In September he returned to the estate apparently normal.

Case 302.—A male Tamil of 45 years who had been receiving prophylactic atebirin for 2½ months apparently went mad on Christmas Day, 1936. The story which unfolded itself on enquiry held much of comedy and something of tragedy and is of interest not only clinically but from the light it throws on the mentality of the people among whom we were working. Cooly No. 302, of the name of Iynan, arranged to buy a wild pig from the aborigines living in the neighbouring forest on Christmas Day, 1936. The aborigines were intercepted however by Kangany Thangavelu, who drove a better bargain than Iynan and received the pig. Iynan took this with ill-grace and on Christmas morning was heard to be muttering to himself while working in the field something about "cutting up and burying". It was not clear whether he was referring to Kangany Thangavelu or to the pig, though Kangany Thangavelu himself had no doubts on the matter. That afternoon, Iynan was apparently visited and "possessed" by one of his gods, Maduraveerasamy, who consoled him by the promise of another pig by eight o'clock the following morning. Maduraveerasamy, we were told, was the swami of hunting and had therefore a special interest in the matter. The objective evidence of Iynan's translation was the fact that he stripped off his clothes and ran round the lines stark naked, muttering imprecations against Thangavelu and murmuring of the pig he had lost and the celestial pig he was promised on the morrow. Meanwhile he entered the estate shrine, a primitive affair of bamboo and palm leaves, to make offering to the gods. It occurred to him that he might offer the paraffin oil of the lamp which lighted the shrine to the god within him, and this he did by the simple expedient of drinking it. His story at this point and for the next two days lacks coherence. He was treated by the estate dresser for paraffin poisoning and on Boxing Day was fairly quiet and able to turn out for work. He waited anxiously but in vain for the arrival of the second pig.

When seen by us on the 28th Iynan was fairly normal in behaviour and conversation until mention was made of the pig promised by his god; when he poured forth a voluble account of how this second pig also had been waylaid by the mischievous and black-hearted Thangavelu and spirited away. The loss of the first pig he was prepared to condone; Thangavelu had merely outbid him in a strictly business deal, but this impious meddling with the workings of divine providence was more than his poor reason could stand. His state of mind was such that it was considered advisable to transfer him to Kuala Lumpur for observation in case he might receive divine sanction to translate his persuasions about "cutting up and burying" into fact. His behaviour in hospital was exemplary, and a week later he returned to the estate apparently normal.

The three instances recorded were the only examples of aberrant behaviour encountered on Estate "T" throughout the year. It may or may not be significant that all occurred in the atebirin group which comprised only one-third of the estate population, and it is an interesting speculation as to how far atebirin is to be regarded as the parent of the celestial pig that was born in the disordered mind of the distracted Iynan.

Effect on Pregnancy and the Birth-rate.—During the period of observation there were nine "live" births and eleven traceable abortions. Most of the abortions, as was expected, occurred among the "controls", and were associated with attacks of malaria. It was of interest that the administration of atebirin had no obvious ill-effect on the pregnant woman, but on the contrary was associated with an increase in the number of live births, an increase due, without doubt, to the suppression of the malarial attacks, which are known to be an important factor in the premature termination of pregnancy in hyperendemic areas.

The Excretion of Atebrin after Prolonged Administration.—It is known that atebirin is retained in the system for long periods and may be excreted continuously for several weeks after therapeutic administration. It is not known however to what extent atebirin given in frequent small doses over long periods is cumulative and for this reason it appeared that data of atebirin excretion following the cessation of prophylactic administration might be of value.

Samples of urine were collected weekly from approximately fifty individuals who had received 0.4 grammes of atebirin weekly for one year, and examined by ultraviolet light for the presence of atebirin after preliminary extraction of the drug with amyl alcohol. The results shown in Table 5 indicate a rate of atebirin excretion similar to that observed after therapeutic dosage for acute malaria, and do not suggest that the drug even though given every week for a year is unduly cumulative.

TABLE V.

Period following cessation of prophylactic administration.	Samples examined.	Atebrin Fluorescence.			
		Strong.	Moderate.	Weak.	Absent.
1 week ..	50	17	23	10	0
2 weeks ..	47	4	24	16	3
3 " ..	46	2	7	26	11
4 " ..	41	0	2	26	13
5 " ..	41	1	0	3	37
6 " ..	48	0	0	3	45
7 " ..	20	0	0	0	20

Excretion of Atebrin after Cessation of Prophylactic Administration.

Malarial Incidence after Suspending Prophylaxis.— Prophylactic administration of atabrin and quinine was suspended in August, 1936, for eight weeks. During this period there was a sharp reappearance of clinical infections; 200 malarial attacks, many clinically severe and associated with high parasite counts, occurred in the two groups formerly protected, an incidence nearly twice that of the unprotected controls during the same period.

There was little indication that this reappearance of malaria was due to fresh infection, for the attacks were sharply related in time to the cessation of prophylaxis; while the mosquito catches and infections during, and for some months before, this 'post-prophylactic' outbreak showed no significant change to account for it.

Clinical Prophylaxis on Estate 'Y.'

Estate 'Y' is an old established rubber estate situated in hilly country in one of the inland districts of Selangor. It has a resident Tamil population averaging 270, throughout which malaria has smouldered for a number of years in spite of the anti-larval measures which were in the past and still are regularly employed. The malarial incidence was high at the inception of the present experiment.

On Estate 'Y' a total of 555 individuals were observed for periods up to 14 months. The population was divided into three comparable groups which received prophylactic atabrin or quinine at the same dosage as that adopted on Estate 'T', or else served for control.

The findings afford an excellent illustration of the necessity for adequate control in experiments of this type. Before commencing prophylaxis the malarial incidence was fairly high; after suspending prophylaxis the incidence was again high. Throughout the course of the experiment the incidence remained low; it was low, however, not only among those receiving prophylactic atabrin and quinine but also, for reasons which are not fully explained, among those to whom no malarial drugs were given other than for the treatment of malarial attacks.

For this reason it is not proposed to detail the statistical findings in this report.

It is of interest that, as on Estate 'T', there was a rapid reappearance of malaria within a few weeks of the prophylactic drugs being withdrawn. Six weeks after the suspension of prophylaxis the management became so alarmed at the reappearance of malaria after a year's relative freedom that prophylactic treatment was resumed.

Clinical Prophylaxis on Estate 'U.C.'

Estate 'U.C.' is a highly malarious rubber estate situated in hilly country intersected by numerous steep ravines. For some years after clearing and planting in 1929 the resident population was small; but when, a couple of years ago, the rubber came into bearing and an increase in the labour force was necessary, malaria became a serious problem.

The labour force is Tamil and the malarial vector *A. maculatus*.

Throughout the year 329 individuals were observed for varying periods up to 11 months.

Preliminary observation made in January, 1936, indicated a trophozoite rate of 50 per cent. and a monthly malarial attack rate of about 25 per cent.

It was hoped that it might be possible on Estate 'U.C.' to collect data as to the smallest prophylactic dosage of atabrin necessary to control malaria under conditions of fairly high endemicity, and experiments on this estate were planned solely with this end in view.

The population was divided into two groups believed to be in all respects comparable. The first group was given prophylactic atabrin at an adult dosage of 0.2 grammes once a week while the second, serving for control, received an atabrin-like tablet known to be inert.

The following tables indicate the monthly incidence of malaria among adults and children during the year:

TABLE VI.

	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Atabrin (reduced dosage) group ..	9	0	11	10	8	1	5	0	2	2	0
Controls ..	19	15	38	40	18	24	17	13	14	5	11

Prophylaxis begun on 1st February, 1936.
Monthly Attack—Rate Per Cent: Adults.

TABLE VII.

	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Atabrin (reduced dosage) group ..	3	0	7	0	0	0	0	4	0	0	0
Controls ..	34	22	52	56	66	45	34	23	7	15	21

Monthly Attack—Rate Per Cent: Children.

Parasite surveys were made on three occasions; the findings were as follows:

TABLE VIII.

	10th January 1936 (Prior to prophylaxis).	5th June, 1936.	27th November, 1936.
Atabrin (reduced dosage) group ..	41	7	3
Control ..	47	35	18

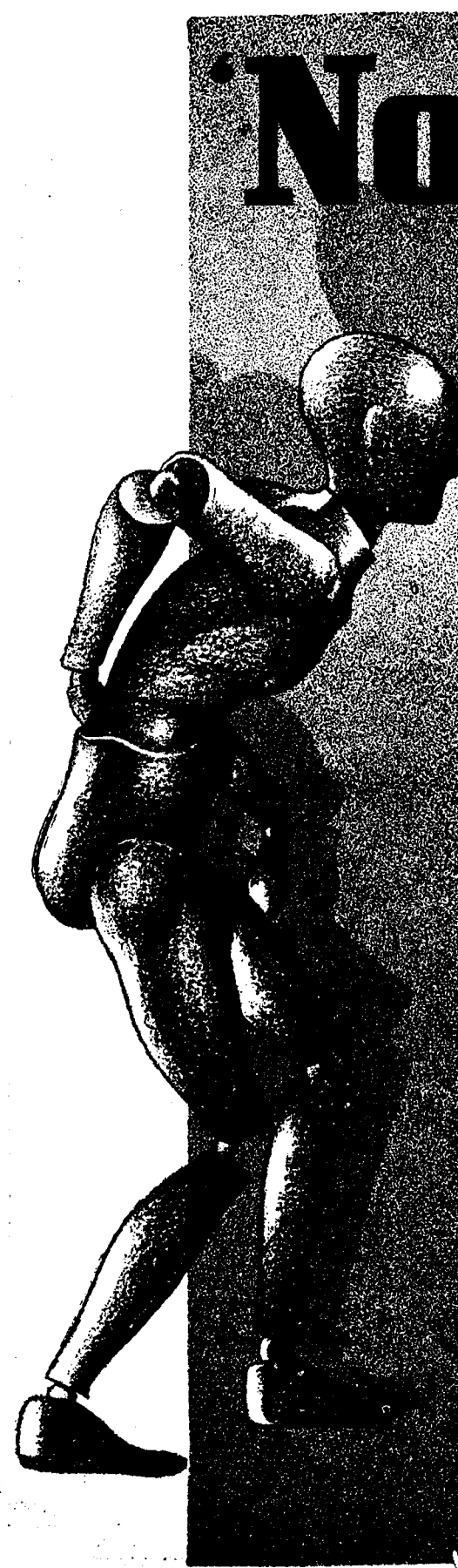
Trophozoite Rate Per Cent: Adults.

TABLE IX.

	10th January, 1936 (prior to prophylaxis).	5th June, 1936.	27th November, 1936.
Atabrin (reduced dosage) group ..	57	4	0
Controls ..	71	59	52

Trophozoite Rate Per Cent: Children.

From Tables 6 to 9 it is clear that the dosage of atabrin employed on Estate 'U.C.' though considerably smaller than



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that recommended by the Malaria Commission and adopted on Estates 'T' and 'V' was relatively effective in reducing the malarial incidence to a low level. Among the children clinical malaria practically ceased; there were four attacks during a period of eleven months among the atebriated children compared with 111 among the untreated controls. Among the atebriated adults malaria continued to occur, 40 attacks being recorded against 165 in the controls.

These findings are of interest in relation to the optimum dosage of prophylactic atebtrin.

The Dosage of Prophylactic Atebtrin.

The question of the optimum dosage of prophylactic atebtrin is of practical importance. Atebtrin is an expensive drug; the local cost of a thousand tablets is over \$50 Straits. Moreover the limits of safety of the drug administered over long periods are not well defined. It was therefore important to ascertain the minimum dosage consistent with reasonable protection under conditions of high malarial endemicity.

On Estate 'T' the prophylactic dosage of atebtrin was that advocated by the Malaria Commission modified only for the children on account of their poor physical development, and was as follows:

Adults	0.2 grammes	on successive days	twice a week.
Children:			
Years	1-2	0.025	" " "
"	3-4	0.05	" " "
"	5-6	0.075	" " "
"	7-8	0.1	" " "
"	9-10	0.125	" " "
"	11-12	0.15	" " "
"	13-16	0.175	" " "

At this dosage the clinical evidences of malaria were almost eliminated but the cost was over \$10 per year per adult. The risks appeared to be of a low order, but the safety was not entirely assured.

On Estate 'U.C.' the dosage was approximately halved and was as follows:

Adults	0.2 grammes	once weekly.
Children:		
Years	1-2	0.05 " " "
"	3-4	0.1 " " "
"	5-8	0.15 " " "
"	9-16	0.2 " " "

At this dosage there was relatively effective control among the children, but malaria continued among the adults with a numerical reduction in the number of attacks of approximately 75 per cent. as compared with the controls.

The cost of atebtrin prophylaxis at this level of dosage was a little over \$5 Straits per year per adult. No evidence of toxic effects were seen.

These findings suggest that the minimum effective dosage under the conditions of Estate 'T' and 'U.C.', that is to say, under conditions of relatively high endemicity, is somewhat less than that adopted on the former estate and more than that used on the latter. The experiment on Estate 'T' is therefore being continued for a further year at the following dosage:

Adults	0.3 grammes	once a week.
Children:		
Years	1-2	0.05 " " "
"	3-4	0.1 " " "
"	5-8	0.15 " " "
"	9-16	0.2 " " "

From the continued experiment on Estate 'T' it is hoped to obtain data of the dosage of prophylactic atebtrin which

will best strike a balance between safety, efficacy, cost and convenience.

WHERE DOES THE TURBIDITY OF THE SECOND PORTION OF THE URINE IN GONORRHEA COME FROM? Josef Frankl. Dermat. Wchnschr., Leipzig, Jan. 23, 1937, 104: 124. Ven. Dis. Inform., July, 1937.

There has been a discussion as to whether the turbidity of the second portion of the urine in gonorrhea is caused by pus formed in the posterior urethra alone or whether the bladder is involved and a part of the pus comes from there. There has also been discussion as to whether there is a back-flow of pus from the posterior urethra into the bladder. The author made tests to answer this question. He examined 40 patients who had gonorrhea of the anterior and posterior urethra but no signs of inflammation of the bladder or adnexa. As the anterior urethra is three times as long as the posterior he assumed that it would secrete three times as much pus. The separation of the pus formed in the anterior and posterior urethra therefore and the determination of the amounts would show where the different portions were formed.

He irrigated the anterior urethra with lukewarm water until the fluid came back clear, put all of this fluid in a glass and coloured it with safran or protargol in order to make a more uniform comparison of the two portions possible. Glass I contained the pus from the anterior urethra and the irrigating fluid. Then the patient was told to urinate. The second glass contained therefore the pus from the posterior urethra and bladder and the bladder urine. Water was added until the amount in the two glasses was equal and the fluid coloured uniformly yellow.

Then, either glass I was more turbid than glass II, they were equally turbid, or glass I was less turbid than glass II. The first case indicated that the anterior urethra produced more pus than the posterior. But as the anterior urethra is 3 times as long as the posterior, if the bladder was intact and the inflammation uniform throughout the urethra, the first glass should be three times as turbid as the second. Such an extreme difference was seen in only a few cases. Generally the urine in the first glass was only about 25 per cent. more turbid than that in the second.

An equal turbidity of the two glasses shows that three times as much pus is formed per unit of surface as in the anterior urethra. It cannot be assumed that such a large amount of pus is formed in the posterior urethra alone but it is quite probable that the trigone is involved also. As the posterior urethra and trigone have the same developmental history this seems very probable. If the second portion is more turbid than the first the disproportion is still greater and it seems very probable that the trigone is also involved or possibly the prostate.

There were only about 25 per cent. of the cases in which it could be assumed that the pus was formed in the posterior urethra alone while in the other 75 per cent. the bladder was apparently involved.

In acute gonorrhea of the anterior and posterior urethra Thompson's two-glass test does not show these conditions so clearly as both portions are affected. The author therefore recommends Janet's method as described above—irrigation of the anterior urethra, urination, and comparison of the two portions—as this gives valuable evidence in regard to the course and prognosis of the disease. When the second portion gradually becomes clearer it indicates healing but when the turbidity of the second portion increases it indicates the development of complications, such as prostatitis or epididymitis.

NEW ARSPHENAMINE SYNTHETICS IN TREATMENT OF SYPHILIS. A CONSIDERATION OF TEST PROCEDURE AND OF A NEW DRUG (TRIARSEN). John H. Stokes and Herman Beerman. Arch. Dermat. & Syph., Chicago. January, 1937, 35: 78, Ven. Dis. Inform., May, 1937.

In Part I of this article the authors discuss the general principles for the evaluation of drugs. They discuss outstanding obstacles to adequate clinical testing of drugs to be used in the treatment of syphilis and present criteria for the evaluation of drugs.

Part II is a report of a chemotherapeutic and clinical investigation of triarsen, an arsphenamine derivative. During a four year period a total of 3,009 injections were administered to 189 patients nearly all of whom had early syphilis. Herxheimer reactions were rare. There were no injuries to special sense organs or to the cardiovascular, hematopoietic or nervous systems. The clinical examination of triarsen is incomplete in that its use so far has been confined practically to early syphilis and no report is attempted on its use in latent, cardiovascular, congenital or neurosyphilis.

Triarsen has a secondary effect on the serologic reaction of the blood in the early stages of syphilis. On the basis of a Kolmer complement fixation test and a Kahn and a Kline precipitation test, comparison with published material indicates that the drug is markedly superior to neoarsphenamine and silver arsphenamine but inferior to arsphenamine in reversing power. With triarsen, 78 per cent. of the positive reactions were reversed to negative by the tenth injection. Of 28 patients receiving 20 or more injections of triarsen alone, 3.6 per cent. continued to have a positive reaction. Of those receiving 20 or more injections of both the arsenical and bismuth preparation, 5 percent continued to have a positive reaction.

The incidence of clinical relapse and serologic relapse in patients treated with triarsen is 6.2 percent in the aggregate and 8.9 percent if the observation is continued six months or more.

On the basis of all available comparative figures, the effect of triarsen on the spinal fluid in early syphilis is superior to neoarsphenamine, silver arsphenamine, and mapharsen.

Triarsen is a new arsphenamine which seems fully equal to the demands of the Co-operative Clinical Group and the International Committee of the League of Nations for treatment of early syphilis. Its dermatitis-producing qualities need to be studied and interpreted further and its apparently striking efficiency with reference to reversal of serologic reaction of the blood and the prevention of asymptomatic neurosyphilis needs further investigation.

GONORRHOEAL ARTHRITIS. By G. Arbour Stephens, M.D., The Medical Press and Circular, August 25, 1937.

There is undoubtedly a certain predisposition in connection with this disease, because it is known that where more than one man has had intercourse with the same infected woman on the same night, one has escaped whilst another may be only slightly affected compared with the third, who is seriously disordered.

It is well known that tuberculously-inclined persons are peculiarly susceptible to the gonococcal infection. These are they who come within the category which the author has described as the "acid class." Members of this acid class are those who have been wrongly fed, their supply of calcium-containing foods having been limited, whilst they have had a partiality for the acid condiments and those foods

which yield an acid residue on burning. The author states that emphasis hitherto has been laid on the importance of the intake of the vitamins, but one has to realise that the value of the vitamins depends on the full use and assimilation of them by the body. If, however, with those vitamins a person consumes some deleterious elements, even the vitamins consumed may have their value reduced to a minimum. This is a new point which the author states needs to be emphasised to the full extent, and in the case of persons suffering from gonorrhoeal arthritis one must, in addition to the specific treatment for the disease, see that everything is done to transfer the patient constitutionally from the acid to the non-acid class.

Treatment.

Accepting the above fact, the first step in treatment is to place the patient on milk, which contains lime, and also to give lime salts with large doses of parathyroid. For the disease itself, he has found that the best results are obtained by the subcutaneous injection of distilled water in doses of 10 c.c. every other day for two or three weeks.

The treatment, according to the author, is based on sound scientific grounds. The distilled water with its high surface tension bursts the cells and mobilises the antibodies, which tend to make the host an unsuitable abode for the protozoan parasites. The treatment is worth a trial even by the most incredulous, because if it does no good it certainly does no harm—a statement that cannot be applied to a large number of modern methods of treatment. He would go further and say that even if the parasite be not killed the general feeling of *bien être* which the injections produce in the patient has some positive advantage.

POST-ARSPHENAMINE EXFOLIATIVE DERMATITIS: ETIOLOGY, COMPLICATION AND TREATMENT. By Ervin, Epstien, M.D., Journal of the American Medical Association, July 10, 1937.

From his study the writer concludes that Postarsphenamine exfoliative dermatitis is preventable in most instances. Preparation with heavy metals of all patients presenting manifestations other than primary or early secondary lesions would probably decrease the incidence of this complication. Simultaneous arsenical and heavy metal therapy is more apt to be complicated by exfoliative dermatitis than is alternating treatment. This reaction is most apt to occur during the first course of arsphenamine injections. At the appearance of the first cutaneous signs or symptoms, it is often too late to prevent the development of a crustaceous dermatitis. The patient should receive immediate hospitalization on the appearance of the dermatitis. Dermatitis exfoliativa is most common in white women between the ages of 20 and 40. Complications include recurrences, furunculosis, chronic eczemas and mild liver and kidney damage.

The blood serum reaction reversed in approximately 60 per cent. of the cases, the Kahn being more often negative than is the Wassermann reaction. The average mortality in this condition is between 17 and 18 per cent. The routine therapy outlined in this paper appears to be efficient, and 10 per cent. dextrose intravenously seems to be of more importance than sodium thiosulfate and the intramuscular injection of liver extract in the treatment of postarsenical exfoliative dermatitis.

The routine therapy used in thirty-one of these cases was as follows:—

One thousand cubic centimeters of 10 per cent. dextrose and 35 units of insulin given intravenously daily. One gram of sodium thiosulfate intravenously every other day for seven doses. One gram of calcium gluconate orally three times a

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EVANS—Latent Syphilis and the Autonomic Nervous System, 2nd Ed. 158 Pages, 50 Illustrations, Rs. 5-10-0 net, 1937.

LEES—Practical Methods in the Diagnosis and Treatment of Venereal Diseases, 3rd Ed., 624 Pages, 85 Illustrations, 8 Coloured Plates, Rs. 10-0-0 net, 1937.

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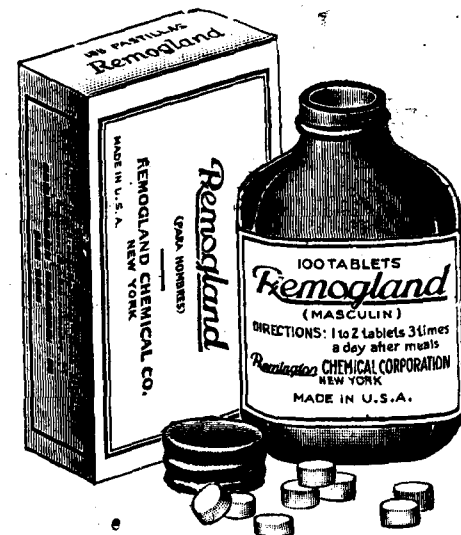
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day, given as much between meals as possible. Four grams of sodium bicarbonate orally three times a day. Daily colloid bath. Various soothing creams and ointments. A diet high in proteins, fats and vitamins but low in carbohydrates. Other agents as indicated.

The following measures were adopted in the treatment of the twenty-eight control patients: Only one patient received 10 per cent. dextrose, although six others received from 25 to 50 cc. of 50 per cent. dextrose intravenously once a day for varying periods of time. In general these patients received much more sodium thiosulfate than the 7 Gm. given in the first series. One patient received 75 Gm., while several were given more than 40 Gm. each. In only three instances was this drug withheld; one of these patients died. One and three-tenths grams of calcium lactate was administered three times a day to eleven patients. This was given before meals so probably little absorption resulted. One patient was given calcium chloride (1 Gm.) in the same manner, while one each received 1 Gm. of calcium gluconate or chloride intravenously daily. Only three patients were given sodium bicarbonate and then only to alleviate gastrointestinal complaints. Two others received 500 cc. of Fischer's solution intravenously as an attempt at alkalization. Nineteen had daily colloid or soda baths. The local treatment was too diversified to be discussed here. Practically all patients were on the general hospital diet; none received the diet previously listed. Seven were given intramuscular injections of liver extract. Iodobismitol was administered to one patient who recovered after 196 days in the hospital.

LAWS IN REGARD TO MARRIAGE OF PERSONS WITH VENEREAL DISEASE.

Florian Werr.
Dermat. Wchnschr., Leipzig, Jan. 23, 1937, 104: 105.
Ven. Dis. Information.

Cuba has had a law requiring a certificate of health for marriage since 1928, Turkey since 1921. In Denmark and Sweden the candidates are not forbidden to marry but the fact of venereal disease must be made known to the other party and both candidates must be instructed by a physician in regard to the possible effects of venereal disease.

The German law for the control of venereal disease adopted in 1927 provided penalties for any one who subjected another to the possibility of infection with venereal disease. It also provided three years' imprisonment for any one who married, knowing he had a venereal disease, without informing the other party of that fact. The law for the protection of the health of the German people passed in 1935 says that marriage cannot be contracted when either of the parties is suffering from an infectious stage of any disease that endangers the health of the other party or of the children. It also provides that the candidates must present a certificate stating there is no impediment to the marriage.

MARRIAGE IN RELATION TO ALCOHOL.

From a paper read by Lilius Blackett Jeffries read at a meeting of the Society for the Study of Inebriety on July 13, 1937.

A recent study on the progeny of chronic alcoholics showed that psychosis of many varieties was found to be definitely more frequent in families of chronic alcoholics than in those of sober persons. Defective lactation was said to be common amongst alcoholic mothers, and also among the daughters of alcoholic fathers in proportion to the degree of their alcoholism. Sir Robert Armstrong commenting stated that drink and drug addiction both tended to alter conduct, and the effect of alcohol when taken in excess (and very little is needed, highly strung persons) was a complete destruction of the moral life. Small doses of alcohol

started a desire and later a morbid craving for stimulants, and the habit of drinking gradually became fixed until inebriety or chronic alcoholism was established. Dr. A. E. A. Carver said that in an institution for inebriates, on investigating the origins of the drink habit, marriage and drink were often found to be very closely associated. Sexual difficulties and alcohol went together. Alcohol helped a person temporarily and fictitiously out of those difficulties; it also indirectly increased them, and alcoholic indulgence might even come to take the place of sexuality, so that a person drank instead of behaving in the normal sexual way. Sister Superior of Spelthorne St. Mary mentioned that in the home for inebriates of which she was in charge the drug addicts were nearly always unmarried women, while the alcoholics were almost invariably married and attributed their alcoholism to married unhappiness.

CLINICAL USES OF THE FEMALE SEX HORMONE.

By C. Kaufmann, Journal of Obstetrics and Gynecology of the British Empire, April, 1937.

The writer reports on his experiences in the use of the female sex hormone. The follicular hormone is responsible for proliferation of the genitalia and exercises a profound effect on the whole body. The corpus luteum hormone is responsible for the preparation of the uterus for pregnancy and for the maintenance of pregnancy. Sufficient information is not yet available in regard to any extragenital effect of the corpus luteum hormone. When hormones are used for treatment it is important to employ the correct dosage. The author points out that the dosage has increased tremendously of recent years, both as the result of finding fresh sources of supply and as the result of experience. In primary amenorrhoea he finds that the ovarian hormones are useless in an attempt to maintain a spontaneous menstrual cycle after the cessation of treatment; but patients suffering from general symptoms of deficiency can be cured with the use of follicular hormone. In secondary amenorrhoea the first essential is to make a most complete and thorough examination in order to exclude any extragenital condition capable of causing amenorrhoea, such as pulmonary tuberculosis and other general causes. The results of treatment in secondary amenorrhoea are on the whole poor. The author gives his dosage for various conditions. The treatment that gave success in some cases was a transfusion of from 250 to 300 cubic centimetres of blood from a pregnant woman. This gave striking results in half the author's cases. In dysmenorrhea in young women with an acutely anteverted uterus the author claims that the symptoms can be entirely removed with follicular hormone in comparatively small doses. In sterility he claims good results for the use of hormone, particularly the follicular hormone. In scanty menstruation good results follow the use of follicular hormone. The juvenile hæmorrhage or menorrhagia of puberty can be stopped by means of the hormone of the corpus luteum. In premenstric hæmorrhages it is necessary to exclude carefully the presence of malignant growths; after this has been done the corpus luteum hormone is of use. It is also of great use in cases of habitual abortion. The author claims successful results in the treatment of general disturbances at climacteric. The dosage and method of use of the various preparations are given in detail.

SEXUAL WEAKNESS AND IMPOTENCE.

By Prof. H. Ritter, Dept. for Skin and Venereal Diseases, General Hosp., St. George, Hamburg, Med. Welt. No. 15, Ars Medici, July, 1937.

Permanent results with regard both to the capacity for coition and for procreation were regularly obtained by intramuscular injections of Præphyson (anterior pituitary

extract) followed by injections of Testifortan (Promonta-Hamburg) together with the administration of the anti-sterility vitamin E. The treatment only failed in cases of complete aspermatism. The patients were given Praphyson 3—5 times a week, 20 injections altogether, followed by 10 Testifortan injections, after which they received another 20 Praphyson injections. The treatment was completed by 2 vitamin E tablets (Merck) 3 times a day for 4 weeks.

BREAKING THE HABIT OF TOBACCO SMOKING.

By Dr. H. Hanel, Dresden, Med. Klin. No. 22, Ars Medici, August, 1937.

After injection of Transpulmin, terpenes and other aromatic substances are eliminated by the upper air passages and combine with the tobacco smoke to substances tasting so unpleasant that the smoker throws his cigarette away after the first few puffs. If 1 c. c. Transpulmin has been injected intramuscularly on 2—3 days in succession, the first and worst part of breaking the habit has succeeded and the patient can attain permanent abstinence by his will-power. Needless to say the Transpulmin injections are perfectly harmless. (Mfg.: Chem. A. G. Bad Homburg, Germany.)

RECOMMENDATIONS ABOUT DIET.

From Report of Intergovernmental Conference of Far Eastern Countries on Rural Hygiene, Bandung, Java, 3-13 August, 1937, Chapter IV Nutrition.

While an exact definition of dietary standards and requirements cannot be attempted, certain general recommendations may be useful as a guide to public health workers and others concerned with nutrition problems in practice. These recommendations deal with a number of questions considered to be of importance, but are not intended to be comprehensive.

- The inclusion of some animal protein¹ in the diet is desirable (and perhaps essential from the standpoint of optimum nutrition), and is strongly to be recommended in the case of growing children and of expectant and nursing mothers.
- Under-milled rice is of greater nutritive value than highly milled rice in respect of Vitamin B¹ and other factors including protein and mineral salts. Highly-milled parboiled rice, unlike highly milled raw rice, may contain vitamin B¹ in considerable quantities. The repeated washing of rice before consumption may result in the removal of a considerable proportion of the vitamin B¹ and other factors originally present. Whole wheat and millet are in various respects superior to rice, particularly highly-milled rice. A diet based on a combination of milled rice with another cereal is to be preferred to a diet based on milled rice alone. The question of rice milling is referred to in the General Recommendations, para. 6.
- Fish is a good supplement to diets largely composed of rice², supplying good protein and sometimes vitamin A. Small fish which are

¹ This term includes the proteins in milk.

² In a number of recommendations the expressions "rice eaters' diet", "diets based on rice", etc., are used, since rice is the most important cereal in Eastern countries. In general, however, the same recommendations are applicable when the diet is based on certain other cereals—i.e., millet.

entirely consumed are a rich source of calcium and other inorganic elements.

- The composition of eggs, which yield good protein, most of the vitamins, together with calcium, phosphorus and iron, makes this food a valuable supplement to the rice eaters' diet.
- Milk³ is rich in the factors in which rice is deficient and is, therefore, of exceptional value as an addition to diets based on rice. In many parts of the East fresh whole milk is unobtainable. The nutritive value of skimmed milk powder from which liquid milk may be reconstituted by the addition of water, and other forms of milk from which the fat has been removed—e.g., butter milk, is emphasized. Skimmed milk contains all the factors present in whole milk except vitamin A and fat, and is a rich source of protein, calcium and certain factors in the vitamin B complex. Unless properly supplemented—e.g., by cod liver oil—skimmed milk is unsuited to form the sole food of infants. It can, however, with advantage be included in the diet of children past infancy.
- Pulses are rich in vitamin B¹ and contain other factors belonging to the B group of vitamins; they are also a good source of vegetable protein. In small quantities—i.e., 50 to 100 grammes daily—they form a valuable supplement to a diet mainly composed of rice.
- Soya bean contains a high percentage of protein and fat and preparations of soya bean are an important dietary ingredient in certain Eastern countries. While soya bean is a valuable food, it does not make good all the deficiencies of diets based on rice. Soya bean "milk" has little in common with mammalian milk beyond a white colour. Suitably supplemented—e.g., by egg yolk, malted sugar and mineral salts—soya bean "milk" may be useful in infant feeding.
- The high nutritive value of green leafy vegetables is strongly emphasized. Green leaf vegetables are rich in carotene, the precursor of vitamin A, vitamin C and certain other vitamins and mineral salts, notably calcium. (The problem of the "availability" of iron in leafy vegetables requires further investigation). Since animal fats containing vitamin A are scarce in Eastern countries, leafy vegetables are of special importance as a source of carotene (provitamin A). They are of higher value when fresh⁴ than when dry and stale.
- Among fruits and non-leafy vegetables, the following are rich in provitamin A: mangoes, papaya, tomatoes, oranges, yellow and red sweet potatoes and carrots. In general fruits and vegetables are good sources of vitamin C.
- Attention may be drawn to the possibility of making use of red palm oil as a source of carotene in certain countries. Crude commercial red palm oil is as rich in vitamin A activity as an average sample of cod liver oil. The

Continued on page 164.

³ The word as used here implies preparations of milk which contain all the nutritive elements presents in whole milk.

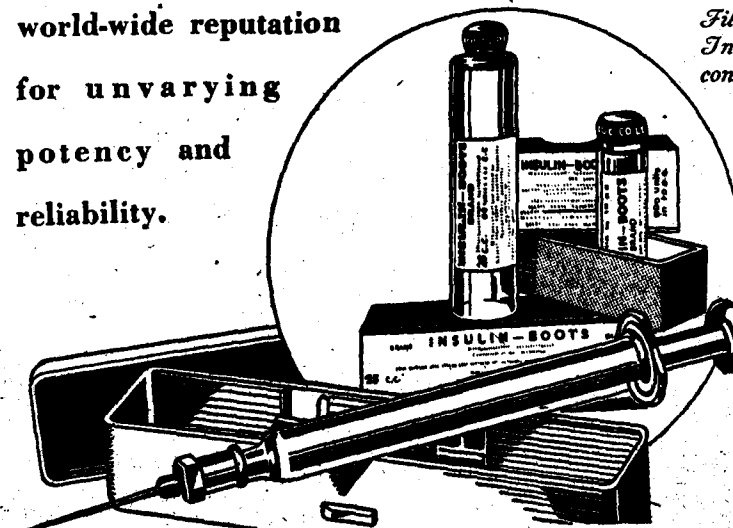
⁴ The term "fresh" does not imply "uncoloured".



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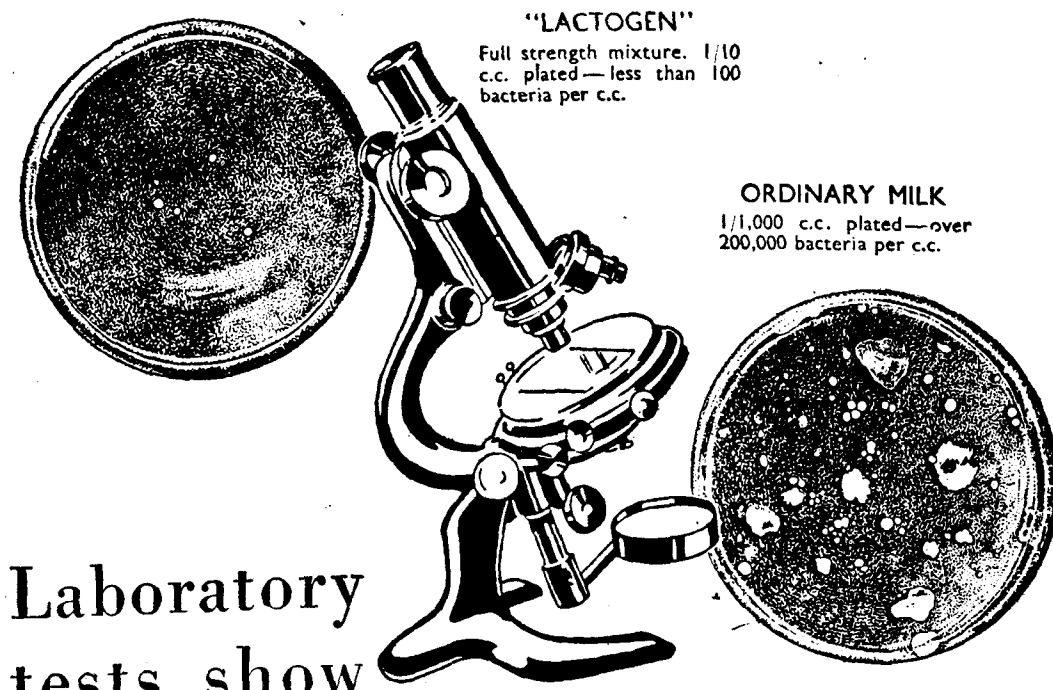


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