

line in the city. A very elaborate natatorium and bath-house have been established. All kinds of hot, cold, vapor, swimming, or mud baths may be had under the direction of Dr. H. S. Tanner, of fasting fame. The water has been analyzed by Prof. W. A. Noyes, of the Rose Polytechnic Institute, with the following result:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Silica	0.71
Alumina	1.17
Strontium chloride	Trace
Calcium chloride	16.27
Calcium sulphide	2.07
Calcium sulphate	27
Calcium bicarbonate	21.94
Calcium phosphate	Trace
Magnesium chloride	13.94
Magnesium bicarbonate	16.44
Lithium	More than a trace
Potassium chloride	3.35
Sodium borate (borax)	Trace
Sodium iodide	Trace
Sodium bromide	More than a trace
Sodium chloride	347.73
Calcium phosphate	5.87
Hydrogen sulphide	More than a trace
Methane (marsh gas)	More than a trace
Total	429.36
Temperature of water, 50° F.	

The waters are mildly aperient, alterative, and tonic. They will be found useful in the disordered states usually benefited by this class of waters.

James K. Crook.

MAGNETISM, ANIMAL. See Hypnosis.

MAGNOLIA and MAGNOLIACEÆ. (*The Magnolia Family*).—This is a small family of trees and shrubs, mostly of warm temperate regions, many of them highly esteemed for their ornamental and fragrant properties. Some valuable timbers are yielded by the larger trees. The bark and herbage are generally permeated by volatile oil and amaroids, so that many of them have been rather extensively used as aromatic bitters. This is especially true of the bark of several species of *Magnolia*, containing *magnolin*, and *Liriodendron*, containing *liriodendrin*. Under the title of "*Magnolia*," *M. virginiana* L., *M. tripetala* L., and *M. acuminata* L., all of the Southern United States, were long official. Their bark is given in doses of 2 to 4 gm. (3 ss.-i.).

Henry H. Rusby.

MAGNOLIA SPRING.—Sumter County, Georgia.

Post-Office.—Plains of Dura.

Access.—Via Southwestern Railroad to Americus, thence by private conveyance to spring.

This spring has been known for many years, and has been steadily gaining in popularity as a place of local resort. No analysis of the water has been made, but it is said to contain iron and sulphur. There is some gas given off, probably carbonic acid. The iron is in sufficient quantity to impart its taste very distinctly to the water. The flow is large, being about fifty gallons per minute. There is a good bath-house, and visitors can find accommodations in private families.

James K. Crook.

MALAKIN, salicyl-para-phenetidin, salicylidene phenetidin (C₉H₉, OC₂H₅, N, CH₂, C₆H₄, OH), is a combination of parphenetidin, the mother substance of phenacetin with salicylic aldehyde. It occurs in small odorless and tasteless silky yellow needles which are almost insoluble in water and cold alcohol but readily soluble in hot alcohol or ether. In a caustic soda solution it dissolves with intense yellow color; and with mineral acids or acid salts it is decomposed into its components, the salicylic aldehyde giving the well-known odor of meadow-sweet. About fifty per cent. of the compound is aldehyde. The urine contains salicylic acid (Schmiedeberg).

Jacquet introduced malakin in 1893 as a remedy for acute rheumatism. As an antipyretic and sedative it resembles the other drugs of the phenacetin class, but it is

slowly absorbed, hence its action is slow and mild. It is split into its components by the gastric juice. As the dose of the drug is small, the amount of salicylic compound must be of little avail in acute rheumatism, though it may be suitable after the acute symptoms have subsided. Abernethy, of Edinburgh, finds it very useful as an antipyretic, but of only moderate value in rheumatism. Ottolenghi has proposed it as an anthelmintic. The dose is 4 to 6 gm. (3 i.-iss.) a day in capsules or powder.

W. A. Bastedo.

MALARIA. See *Plasmodium Malaria*.

MALARIAL DISEASES.—Malarial diseases consist, first, of *fevers*, intermittent or remittent, benign or pernicious, and, second, of a condition of chronic ill-health known as *malarial cachexia*.

The fevers are infectious in their nature, characterized by regular intermissions or less regular remissions, and are caused by the presence in the blood of certain protozoa or haemacytozoa, discovered by A. Laveran in 1880 and called by him the *plasmodium malaria*. The principal and perhaps the only way in which man is infected with this plasmodium is through the bite of a certain variety of the mosquito, known as the *Anopheles*. This *Anopheles* mosquito must previously have sucked the blood of a malarial patient and thus have become the "intermediate host" of the malarial parasite, which, having gone through with a certain necessary portion of its life and development within the organism of the mosquito, is now ready for re-introduction into and renewed life in the human blood.

From the earliest history of medicine to the present day malarial fevers have been known to be practically confined to marshy regions in certain portions of the temperate and tropical zones. They have been believed to be caused by emanations from the soil of such regions, known as "marsh miasms." The fact that the *Anopheles* mosquito which has sucked the blood of a malarial patient and which, after a certain length of time, bites a non-malarial subject, can thereby infect the latter with malaria has been proved beyond all question. But this does not establish the true origin of the malarial germ or parasite. Whence did the first man or the first mosquito obtain the malarial germ? This question is not yet answered by science. It is not unreasonable to suppose that the origin of the germ will yet be found to be in the soil or the water or the plant of a malarial region, beginning its existence outside of any animal body, even, though, perhaps, always introduced into man by the bite of the mosquito. Science has not yet spoken the last word on this subject.

For a full history and description of the malarial parasite the reader is referred to the article on *Plasmodium Malaria*, in Vol. VI. of this HANDBOOK.

The mosquito, as a disease-carrier, is fully treated of under the head of *Mosquitos in their Relation to Human Pathology*, in the present volume.

It therefore remains for this article to consider only the clinical history, the pathology, and the treatment of malarial diseases.

MALARIAL FEVERS are divided into (1) *ordinary or simple intermittent fevers*, which are benign, and (2) *irregular, remittent, or continued fevers*, which may be either benign or pernicious. The second class, whether benign or malignant, are now called "*æstivo-autumnal fevers*" (summer-autumn fevers), because in the neighborhood of Rome, where the organisms causing these fevers were first carefully studied, such fevers prevail in the summer and autumn alone. The only reason for retaining the name is because the variety of parasite giving rise to these continued or remittent fevers has, by most parasitologists, been designated as the *æstivo-autumnal* parasite.

While there is still a difference of opinion among authorities as to the number of species of malarial parasites that exist, there is a general consensus of opinion as to the existence of at least three well-defined species, viz.:

1st, the simple tertian; 2d, the simple quartan; and 3d, the *æstivo-autumnal* parasite, the latter being divided into two varieties: (a) the one producing true quotidian *æstivo-autumnal* fever and (b) the one producing the *æstivo-autumnal* tertian.

The first two species give rise to all the simple intermittent fevers and the third species to all the irregular, remittent, or continued fevers, whether benign or malignant. These different species can be distinguished from one another, by those familiar with the subject, by their size, growth, pigmentation, method of sporulation, etc.

INTERMITTENT FEVER.—This is the variety of fever characterized by a chill, fever, and sweat, occupying a part of the twenty-four hours, followed by an interval, before the next paroxysm, of some hours or days, during which there is no fever. The cause of a paroxysm of intermittent fever is the fact that a generation of malarial parasites, of sufficient number, in the blood corpuscles of the patient, arrive at maturity and sporulate. If these parasites be of the simple tertian species they will mature and sporulate every forty-eight hours or every other day. The terms tertian and quartan are misleading until we remember that the ancients counted every fever day both as a third or fourth day and as a new first day. A tertian, therefore, has one well day between two consecutive fever days, and a quartan has two well days between the fever days. Let us suppose that a man is infected with two separate generations of tertian parasites, maturing on successive days, which is a very frequent occurrence. Such a man has a double tertian intermittent, which means that he has a quotidian or daily fever, caused, however, by the tertian parasite, as is shown by the following diagram, where A and B represent the two generations.

Double tertian—

A days	..... 1	2	3	2	3	2	3	2
		A	B	A	B	A	B	A
B days	.....	1	2	3	2	3	2	3

The quodidians may also be formed of a triple quartan, three generations of quartan parasites, A, B and C in the diagram, maturing on three successive days.

Triple quartan—

A days	..... 1	2	3	4	2	3	4	2	3
		A	B	C	A	B	C	A	B
B days	.....	1	2	3	4	2	3	4	
C days	.....		1	2	3	4	2	3	4

There is no simple quotidian parasite. All quotidian fevers which are not *æstivo-autumnal* are either double tertians or triple quartans. A rarer form of duplication is that of the double quartan which gives us two successive fever days with an intervening free day. Mixed infections of simple tertian and quartan parasites may occur, causing much perplexity to the clinician, or a mixture of simple tertian and *æstivo-autumnal* parasites. In the latter case the simple form soon succumbs while the *æstivo-autumnal* survives.

Symptoms.—A paroxysm of intermittent fever presents three stages: the stage of chill, that of fever, and the sweating stage. The chill is sometimes preceded by prodromal symptoms of general uneasiness, yawning, stretching, possibly nausea or headache. With or without these prodromes, the patient then experiences sensations of cold which soon develop into slight rigors or into a prolonged, shaking chill, which may last but a few minutes or may be prolonged for an hour or more. During this stage, when the patient is shaking with cold, his nose and finger-tips blue and his extremities cold to the touch, the fever has actually begun and the temperature under the tongue may be as high as 104° or 105° F.

The chill is followed by sensations of heat and great heat of the surface of the body, although the temperature rises no higher than before. Headache and pain in the limbs are now common. The fever stage varies in

duration from an hour to six or eight hours. The termination of the fever is accompanied by more or less profuse sweating, lasting for from half an hour to two hours or more, during which stage the patient loses all his acute sufferings and quite commonly falls into a quiet sleep. On awakening he declares himself as feeling quite well, although perhaps a little weak. He continues to feel well until the onset of the next paroxysm.

Herpes labialis is quite a frequent accompaniment of intermittent fever and is of some diagnostic value because so rarely occurring in graver fevers.

Dumb Ague, as it is popularly called, is that form of paroxysm in which there is no chill, the hot stage being the first. This is more common among the older residents in malarial regions.

Sometimes an attack of intermittent fever will be so shrouded by intercurrent symptoms as to mislead the observer. There may be so much congestion of the bronchial mucous membrane, with short, difficult breathing, slight cough, fine mucous râles, and even a catching pain in the side, as to suggest the invasion of pneumonia. Violent vomiting and diarrhoea at the outset of the paroxysm may pass for a mere attack of cholera morbus. Severe pain in the back and limbs, often referred especially to one joint, which the patient is unwilling to move, crying out with pain when he does so, closely simulates rheumatism. In all such cases the unwary practitioner may flatter himself that he has been very successful in "breaking up" an attack of one kind or the other, only to find it recur in full force at the end of its appointed time.

In children under two years of age, and often in those of the age of three or four, there is no such thing as a shaking chill, and the first thing that may be noticed by the attendants is the fever. Careful observation, however, will detect the stage of chill by the fact of the lips and nails becoming blue, the nose and extremities cold, and the face pale and the eyes sunken. Sometimes the child will vomit two or three times in succession, and then it wants to go to sleep. After a little while the face grows flushed, and the surface of the body hot; the child becomes quite restless, throwing itself about in the bed; and in a certain number of cases convulsions supervene. Other children, again, pass from the cold to the hot stage without waking, but, on the contrary, fall into a profound sleep or semi-comatose condition, from which they gradually emerge during a brief sweating stage. Children are more liable to quotidian than to tertian attacks, and during the intermission they do not seem well, but are peevish, and perhaps drowsy, with a poor appetite and some disturbance of the stomach and bowels.

Pathological Anatomy.—Ordinary intermittent fever not being a fatal disorder offers no opportunity for post-mortem findings. An examination of the *blood*, however, reveals not only the presence of the malarial parasite, with its accompanying pigment, in the red blood corpuscles, but a loss of red corpuscles, sometimes very great, during the paroxysm of fever. This loss is usually, to a great degree, regained during the intermission, but few diseases cause so great anæmia as do malarial fevers, especially, of course, the prolonged forms. According to Kelsch, quoted by Marchiafava and Bignami in the "Twentieth Century Practice," vol. xix., "twenty days of fever may suffice to reduce the number of red corpuscles in a patient from five million in a cubic millimetre to one million or even less," and in pernicious infections, at the beginning of the disease, according to the same authority, "in a robust individual, in the course of one day only, the number may go from normal to one million per cubic millimetre."

There is never leucocytosis, unless it be dependent on the accidental presence of some inflammation; but, on the contrary, the number of leucocytes is greatly diminished. Pigmented leucocytes, which have swallowed the degenerated red cells with their contained parasites and pigment, are not infrequent.

The *spleen* is palpably enlarged during the paroxysm of fever, this enlargement subsiding during the intermis-

sion. Only in chronic cases does the enlargement persist during the interval between febrile attacks. In the few autopsies reported in which death occurred from other causes immediately after an attack of intermittent fever the enlarged spleen was found not to be softened nor very melanotic, nor were the liver and bone marrow very melanotic.

The urine is increased in amount both during and after the fever. The specific gravity of the same is also increased, notwithstanding the large amount of the secretion, a change which is due to the absolute increase of the salts and nitrogen eliminated. In the polyuria of convalescence, especially after tertian or quartan intermittent, the amount of urine voided sometimes amounts to from four to six pints in twenty-four hours, the specific gravity still remaining increased relatively to the amount, this increase being due largely to the excess of urates and phosphates. Albuminuria is rare and hæmaturia belongs to the pernicious fevers.

Diagnosis.—The diagnosis of intermittent fever is easy, if the symptoms are at all marked, especially if we wait until the patient has gone through the intermission and entered upon a second fever paroxysm. At least this is true in a single tertian or quartan fever. It is not always so evident when, with a double tertian, for instance, we have a daily fever paroxysm, of long duration, as in those cases, referred to above, in which the access of fever is accompanied by such local symptoms as suggest some other disease, such as pneumonia. At all times it is of great value to have a blood examination made, to prove, if possible, the presence of the malarial parasite and to determine whether we have to deal with a simple tertian, a quartan, or an æstivo-autumnal parasite. To give a satisfactory result the blood specimen should be taken early, before the patient has been loaded with quinine.

Treatment. Prophylaxis.—So far as regards measures which shall change a malarial region of country into one that is non-malarial it has long been known that this could best be accomplished by the drainage of marshes or of such areas as favor the accumulation of stagnant ponds or pools. Since we know that the mosquito is the carrier of infection, it is necessary also to remove all smaller collections of stagnant water, as in tanks, barrels, etc., which might serve as the breeding places of the mosquito, or to protect them from the access of the insect. Drains, cesspools, etc., must be treated with disinfectants or with coal oil which renders them unfit for breeding places. An oily film over the surface of water containing the larva or pupa of the mosquito prevents their access to air and thus insures their death. For this purpose coal oil is found to be the most practicable as well as the cheapest material. It is amazing to note how much can be accomplished in the extermination of the mosquito, by means of drainage and the coal-oil treatment of pools and small collections of water, at no very great expense to municipalities, local governing boards, or private individuals. Among the well-known instances of this sort of work successfully accomplished are the practical suppression of yellow fever in Havana in 1901, chiefly through the labors of the "mosquito brigade," and the campaign against mosquitos, and therefore against malaria, waged by means of drainage and coal oil at Oyster Bay, Long Island, during the same year. Dr. L. O. Howard, Entomologist of the United States Department of Agriculture, has taken much pains to make public the necessary information on this subject, and before this article appears in print, the matter will already be familiar to many of its readers.

In the way of personal prophylaxis it is evident that the main thing, if not the only thing, is to avoid being bitten by the mosquito. For this purpose residences, whether permanent or temporary, should be located on as high ground as is practicable and away from standing water. Doors and windows should be carefully screened and people should sleep under mosquito nets.

As the insect is by far the most active toward sundown and at night, it is essential to remain indoors at those

times, if possible. Prophylactic doses of quinine are also to be recommended, one or two grains three times a day. It has repeatedly come within the experience of the writer that in parties of men newly exposed to malarial influences those who took such doses of quinine escaped, while those who refused succumbed to some form of malarial attack.

Treatment during the Paroxysm.—In ordinary attacks of simple intermittent fever no treatment is required during the paroxysm, and the patient may be allowed to follow his own inclinations in the matter of being covered or uncovered, taking hot or cold drinks, having hot bottles applied to his feet, cold cloths to his head, etc. In the more severe attacks, where there is more than ordinary general prostration and distress, or the patient suffers greatly from headache, or pain in the back and limbs, it is a good plan to administer a full dose of opium during either the stage of chill or that of fever. The effect will be to alleviate the suffering, and, perhaps, to shorten somewhat the first or second stage. A full dose, forty to sixty grains, of bromide of potassium, will answer the purpose if there is not severe pain. In case there is any reason, from the previous history of the patient or the nature of his present attack, as shown by unusually high temperature (over 105° F.) or grave nervous symptoms, to fear that it may prove pernicious in character, thirty grains of quinine should be given in one dose during the cold, or early in the hot stage. A single large dose is far more effective than repeated smaller ones, and less likely to disturb the stomach and aggravate the headache.

During the Intermission.—The entire treatment of a case of intermittent fever is usually conducted during the intermission, the object of course being to prevent the recurrence of the paroxysm. In some cases in which there is a badly coated tongue with sluggish action of the bowels and clay-colored stools, it is well to begin the treatment with a few small doses (gr. $\frac{1}{4}$ to gr. $\frac{3}{4}$) of calomel every two or three hours, followed by a saline cathartic at the end of twelve or twenty-four hours, or ten grains of the Pilula hydrargyri, with two or three of compound extract of colocynth, may be given at bedtime. But it is very important that no time should be lost in this preliminary treatment to the exclusion of quinine, for the two can, to the very best advantage, be used at the same time. As soon as one paroxysm is over, it is time to begin taking quinine to prevent the next one. When the type of the fever has not been determined by the occurrence of more than one paroxysm, it is well to assume that it is quotidian and treat it accordingly.

The full effect of a five- or ten-grain dose of quinine is felt in from two to four hours after its administration. Suppose the chill of a given paroxysm to have begun at 10 A.M., and the sweating to have ceased at 6 or 8 P.M.; I should have that patient take ten grains of quinine at midnight, ten at 4 A.M., and ten at 8 A.M., and should expect thus to avert the second paroxysm, which would be due at 10 A.M. of that day. If successful in this, I should give no more during that day, but I should repeat the same programme during the second night. Having thus prevented two recurrences, I would then put the patient on five grains of quinine three times a day for a week, and after that drop to two grains three times a day, which dosage should be continued for a month, if the patient remains in a malarial region. If thirty grains in three doses did not prevent the recurrence of the chill on the day following the first paroxysm, I should mass that amount and give it either in two doses of fifteen grains each, one at 3 A.M. and one at 7 A.M., or in a single dose at 7 A.M.

No one who has tried it can have any doubt with regard to the frequent efficacy of large doses of quinine where smaller ones fail, nor is the discomfort caused by the large dose as much greater as would be supposed.

There are two plans, then, for the administration of the requisite amount of quinine during the intermission: the one to give it in five-grain doses every four hours, beginning toward the end of the sweating stage; the other to give it in two or three ten- or fifteen-grain doses at the

same interval, but so arranged that the last dose shall come two hours before the expected attack. I prefer the latter.

Method of Administration of Quinine.—A solution of quinine is doubtless the most certain method for internal use, but is objectionable on account of its intense bitterness and its liability to cause vomiting. The most practicable and at the same time the most efficient method is to enclose the dry powder in gelatin capsules or in wafers. All ready-made pills are to be avoided, on account of their possible insolubility.

The syrup of yerba santa is the best vehicle for disguising the taste of the drug, and is therefore valuable in case of children or others who cannot swallow capsules.

When rejected by the stomach the drug may be given in enema, double the amount being used here that would be given by the mouth. I have very little faith in the endermic method, or the quinine and vaseline inunctions used by some. The hypodermatic use of quinine, however, has much in its favor. It is prompt and certain in its action, and is sometimes the only method that can be employed. The objection to its use is the considerable danger of abscesses forming at some of the points of puncture. From one-fourth to one-half of the dose ordinarily given by the mouth is required by this method.

When speaking of quinine simply, one is understood as referring to the sulphate of quinine, the salt in most common use. Other salts of the alkaloid are equally efficacious. The bisulphate is more soluble, so also is the hydrochlorate, though the latter is said by some not to be so uniform in strength. The bromide and the valerianate of quinine are preferred by some on account of the supposed benefit to be derived from their respective acids.

Next in value to the quinine salts are those of the other alkaloids of cinchona, viz., quinidine, cinchonidine, and cinchonine. Their value has been thoroughly tested by several commissions appointed for this purpose in India, the result of whose investigations proves that these are all of equal, or nearly equal, value with the sulphate of quinine. While the sulphate of quinidine is just as effective as the sulphate of quinine, when administered in the same doses, it is very apt to cause gastric distress, vomiting, and purging. The sulphate of cinchonine is effective in somewhat larger doses than quinine, but is also more liable to disagree with the stomach. The sulphate of cinchonidine produces the same effect as quinine, in doses that are twenty-five per cent. larger than those of the latter, without any disagreeable effects. I have myself had considerable experience with the cinchonidine salt, and have obtained thoroughly satisfactory results from its use in five- and ten-grain doses.

The remedy next in rank to the cinchona alkaloids in the treatment of intermittent fever, though far below them in efficacy, is arsenic. It is more effective in cases of chronic malarial cachexia, and is very valuable, when used in combination with quinine and iron, in all old and obstinate cases of intermittent fever. It has, however, also been successfully used alone in the treatment of acute cases, especially by some French physicians. They give as much as half a grain of arsenious acid in solution in the course of a day, during the intermission, with very good results. The same treatment has been successfully employed in India, care being taken to select patients with no gastric or intestinal irritation. It is important that the remedy be used largely diluted, and when desirable it may be combined with small doses of opium. As a rule, its action in preventing the recurrence of paroxysms of fever is much slower than that of quinine.

Prognosis.—Ordinary intermittent fever, in the early history of any given case, is probably always susceptible to cure by the proper administration of quinine. Spontaneous cures are not infrequent, the fever running its intermittent course for a week or two and stopping without medication. If such patients have ceased to live in a malarial region the cure may be permanent. If they remain in a malarial region, the fever is almost sure to re-

turn after a variable period. It cannot be too strongly insisted on that after the arrest of paroxysms of intermittent fever, the patient should continue to take quinine during the fever season, either in small doses daily or in larger doses, of ten or fifteen grains, every third day, or at the outside every week.

MASKED INTERMITTENTS.—Under this head fall a variety of obscure affections, usually non-febrile in character, having a distinct periodic recurrence, and being curable by quinine. Prominent among them are periodic neuralgic attacks, usually in the form of one-sided supra-orbital or infra-orbital pain, with throbbing of that side of the head; sometimes a one-sided conjunctivitis and swelling of the lids. After a few hours all these symptoms will entirely disappear, to recur regularly in quotidian or tertian form. Or the pain may be along the track of the maxillary nerves, superior or inferior, or of the sciatic or the intercostal nerves. In the latter case both patient and physician may suspect pleurisy, and flatter themselves that they have cured it, until, on the second or third day, it promptly recurs.

Many other nervous disturbances, as choreiform seizures, temporary paralyses, etc., occur with periodic regularity in malarial regions, and yield to treatment by quinine. Although some authors protest against it, the conclusion is very natural that such attacks are of malarial origin. I have myself seen, in a young man, a well-marked case of amnesic aphasia which occurred regularly on the afternoon of every other day for three successive times, after which he was put on ten-grain doses of quinine, three times a day, without any further recurrence of the trouble.

In all such cases, and many others that cannot be here enumerated, the entire absence of all symptoms during the greater part of the time forbids the thought of any organic lesion, while the regular periodic recurrence of these symptoms, and the fact of their yielding to anti-malarial treatment, afford proof of their malarial origin.

At least this was proof enough before we knew anything about blood examinations for the malarial parasite. To-day no one would consider such a diagnosis unequivocal without the aid of the microscope, and it is quite probable that, by means of blood examinations, many maladies heretofore believed to be malarial may be shown not to be such.

IRREGULAR, REMITTENT, OR CONTINUED FEVER; ÆSTIVO-AUTUMNAL FEVER.—All observers, from the earliest period, have recognized a variety of malarial fever which differed from the ordinary intermittent type, being characterized by longer continuance of the fever paroxysms, with remissions rather than intermissions. This form is more grave, more likely to be long-continued and refractory to treatment, and more fatal. Parasitologists generally agree that this form of fever, in all its varieties, is due to the presence of the æstivo-autumnal parasite. In this class are also embraced the pernicious fevers which are not long-continued, and which have always been known, in many instances at least, to have a distinctly intermittent character. We used to class pernicious fevers among the intermittents, but now they are reckoned as æstivo-autumnal. There is abundant evidence that any of the fevers caused by the æstivo-autumnal parasite may, at least in their earlier history, be intermittent instead of remittent, taking on later the remittent or continuous type. Many authors assert the existence of a quotidian and a tertian variety of the æstivo-autumnal parasite. Others make different and more numerous divisions, but there is practical unanimity as to the species. This element of intermittence in fevers caused by the same species of parasite that gives us a remittent or continued fever brings great confusion into our terminology, which will have to be recast, on the basis of the findings of the microscope, whenever parasitologists are agreed and they and the clinicians can come together.

For the present we must content ourselves with remembering that ordinary intermittent fever due to the larger, simple, tertian or quartan parasite, differs essen-