

may be said that to inject all the branches of the external carotid is not a safe procedure. Thus, for example, if in dogs the superior thyroids are plugged, they permanently lose the use of the vocal cords. If the linguals are plugged, the tongue either sloughs or at best it can no longer be moved at all. Hence, when the act of swallowing is performed, this organ fails to push back the epiglottis, as it should, the entrance to the larynx is left uncovered, and food, drink, and saliva then enter the air passages, often giving rise to a fatal pneumonia due to the entrance of foreign matter (*Schluckpneumonie*). Obstructing the posterior auricular artery causes sloughing of the ear. We must remember that the normal tissues demand some blood in order to live. However, it does seem to the writer worth while to try this idea, very cautiously, upon those three branches which chiefly anastomose with outside systems—the occipital, and the two terminal arteries in the substance of the parotid—and then to excise the external carotid as usual. At the same time I am convinced that the use of boiling water in the manner suggested would be likely to end fatally, either through the establishment of multiple venous embolisms, or perhaps by producing serious shock. But both Dr. Bristow and I have tried successfully a mixture, which I suggested, of one part of hard white paraffin and nine parts of white vaseline. This remains solid at or below 108° F. If injected at say 125° F., it will not set, if the work be done expeditiously, before its completion. In the full-sized adult, with blood-vessels of ordinary capacity, not more than 1.5 to 2 c.c. of this mixture should be injected distally into the external carotid at a point say from 2 to 3 cm. below its entrance into the parotid gland, thus obstructing its two terminals and preventing a renewal of blood supply through the internal carotid system; and from 2 to 4 c.c. may be injected into the occipital at its point of departure from the external carotid. Upon reflection it will readily be recognized that although time may prove this particular method of injection a valuable addition to the technique of vascular extirpation, through its power to effect an anemia of a somewhat more permanent character, yet so far as obstructing the internal maxillary and the superficial temporal arteries is concerned, an overdose would certainly be most perilous. Running like any fluid in the direction of least pressure, the mixture would enter not the capillaries of those arteries (if too much were thrown in) but first their free anastomoses. For example, the infraorbital, or main continuation of the internal maxillary, would empty the excess of the paraffin mixture into the ophthalmic branches of the internal carotid. Here, if yet a little more should be injected, the arteria centralis retinae would be plugged (blindness); and, if still more should be thrown in, the vessels at the base of the brain would be filled,—with a prompt death from respiratory failure! Obviously, such a weapon calls for caution in its use. Nevertheless, we are fighting a savage enemy that grants no quarter, and therefore serious measures are abundantly justified. Besides, the operation is the patient's *dernier ressort*. The dose recommended above has more than once been safely injected upon the human subject by both Dr. Bristow and by myself. But experiment upon the cadaver proves that a much larger dosage would be unsafe.

Recently, the Roentgen and the Finsen rays and Coley's antitoxin injections have each given us remarkably hopeful results in certain cases of malignancy. But, unaccountably as yet, there are instances which do not yield to any of these means. For such as these it is well that the profession should know that the limit of our armamentarium has not been reached, and that in the carotid region the starvation plan is abundantly worth a trial. Within the brief compass of this article we can but outline the subject. For fuller details the reader is referred to the author's Gross Prize Essay upon the "Starvation of Malignant Growths," published in 1902 by the F. A. Davis Co., of Philadelphia. *Robert H. M. Dancarn.*

**MALIGNANT JAUNDICE.** See *Liver, Diseases of: Acute Yellow Atrophy.*

**MALIGNANT OEDEMA.** See *Gangrene. (Surgical.)*

**MALIGNANT PUSTULE.** See *Anthrax.*

**MALPRACTICE.**—Medical malpractice is usually understood to mean bad or unskilful practice on the part of a physician, surgeon, dentist, or midwife, when, as a result of such bad practice, death ensues or the patient's health or efficiency is impaired. Malpractice may be wilful, negligent, or ignorant, and either criminal or civil suits may be brought. As a rule, criminal suits for malpractice are brought only in cases of criminal abortion, or when a physician or other individual gives some drug or performs some operation which is contrary to law. He may perform an unlawful operation, or one which is in itself lawful in proper hands or under proper conditions. Civil suits for the recovery of damages on account of injuries supposed to have been experienced as a result of wilful negligence or ignorance on the part of a practitioner are much more common.

The responsibility of a physician or surgeon should be clearly understood, and while the rulings of the courts of various States and countries differ materially, they are fairly well set forth and may be, as a rule, easily followed. Unless there is proof to the contrary, it is assumed by the courts that no contract was entered into, and, provided reasonable care, skill, and diligence are used, the practitioner may not be held responsible for the result; in other words, it is generally understood that the physician or surgeon does not guarantee either a cure or any definite result, but he is expected to use his best endeavor to accomplish a favorable result.

Malpractice may be either active or passive. Negligence which allows the death of a patient from failure to control a hemorrhage, or to furnish other suitable emergency treatment, is as reprehensible as a more active malpractice which brings about that death by causing a hemorrhage through carelessness or negligence in operating. Errors of omission are as great as those of commission, but the former are apt to be less harshly judged than the latter.

The physician, surgeon, or other practitioner, when called upon to treat a case, is expected to exercise reasonable and ordinary skill, care, and diligence, and it is usually held by the courts that this is sufficient, provided he is possessed of and uses that amount of knowledge and skill which might reasonably be expected from one engaged in similar practice in the neighborhood in which he lives. By this ruling the general practitioner in a small country town, living far from the centres of population and medical education, is not expected to possess or to exercise as much knowledge and skill as would be expected from a specialist in one of the large cities near the centre of medical education. He is, however, bound to exercise the average degree of skill possessed by persons of his profession in his location. It must be remembered that this does not necessarily mean the average skill of the whole number of practitioners in his district, for a considerable number of such practitioners may be of extremely low grade, while, on account of education and experience, he might well be expected to possess a much higher degree of intelligence. It must be the average skill of those living in his district and under his conditions. In Pennsylvania it has been held by the courts that "such a degree of skill is required as a thoroughly educated surgeon ordinarily employs"; in the majority of the other States, however, the position taken is rather that which has been before described.

While the professional man is supposed to exercise his best judgment and skill, it is not supposed that he is infallible, and it is appreciated that errors in judgment may be made even by the best and most conscientious, and no one will be held responsible for such errors provided ordinary and well-established lines of diagnosis and treatment are followed.

If the methods of diagnosis and treatment are unusual and differ from those which are commonly accepted as proper and well established, he may be held responsible

for bad results following such unusual methods. For this reason new or unusual methods should not be attempted unless one is prepared to withstand criticism if the results are not all that might be expected. If such new or unusual methods are to be used, the patient, or his representative, should be informed that such is the case, should thoroughly understand the reason for such changes from well-established lines, and should agree to their use. It probably would be acknowledged by the courts that progress in medicine and surgery depends upon modifications in methods, and if such modifications are reasonable and based upon sound premises, it is probable that judgment would not be very severe.

Conditions may be such that a greater amount of skill would be expected from the medical man or surgeon who has been called from a distance than from those practitioners who live in the district in which the case occurs. In such cases, where a specialist from a large city is employed, he would be judged by the methods employed in the community from which he came. He may use methods which are not common where the patient is located, but he will be expected to have and use that degree of skill and knowledge which might reasonably be demanded from those having like opportunities.

When a contract has been entered into by which a cure, or some definite result, has been pledged, the practitioner will be held responsible for the fulfillment of such a contract.

Gratuitous services do not exempt the practitioner from action for malpractice if either ignorance or carelessness in his attendance can be proved. The trained physician is expected to use the same care and diligence in the treatment of charity cases that he does in those from which he receives a large fee. This does not mean, however, that in cases in which advice is sought and given, responsibility for the result is involved if the person whose advice is asked is not a professional and does not claim to have the knowledge of one. He will not be held responsible for bad results if he has given as good advice as might reasonably be expected from one in his position.

**CONSULTATIONS.**—Cases frequently occur in which, on account of lack of experience or for other reasons, physicians feel themselves incompetent properly to diagnose or treat a given case. When this condition exists, it is the duty of the physician to call in consultation with him some other more fitted than he to judge in this particular case, and, if he appreciates that this condition exists, then he is responsible if he fails to do so. Such rulings follow the lines already mentioned by which he is expected to use due care, diligence, and skill in cases in which new or unusual methods of diagnosis or treatment are employed. When capital operations are performed, it is always safer, and usually wiser, that a consultation should be held, and the consultant who is called should be, if possible, one who is recognized as particularly well fitted for judgment in such cases.

**CONTRIBUTORY NEGLIGENCE.**—When it can be proved that the patient refused to carry out the physician's instructions or failed to exercise due care, the physician or other practitioner is relieved from any responsibility which may follow as a result of such negligence. The practitioner is supposed, however, when giving instructions or outlining the treatment, to consider the personality of the individual and his surroundings, and only such instructions should be given as it is possible to follow out.

When a medical practitioner has recovered compensation for his services through the courts, such recovery will interfere with any future suit for malpractice on the part of the patient. Partners in medicine or surgery are held jointly liable for malpractice by any member of the partnership.

**SUMMARY.**—A practitioner of medicine or surgery will be guilty of malpractice when serious results follow on account of his gross ignorance or neglect; when he uses medical or surgical methods that are prohibited by law; when he makes use of unusual methods which are apt to endanger the life of his patient; and when he neglects

to use such means as may be necessary for the safety of his patient. He is liable for any bad result which may depend upon a want of knowledge or lack of care on his part. He is required to exercise the amount of skill which can reasonably be expected from one under his conditions. Gratuitous treatment does not relieve him from responsibility for the result. He cannot be compelled to assume the care of any case unless he so wishes; but, having accepted it, he cannot withdraw without giving suitable notice of his intention. An action for malpractice cannot be brought after he has recovered in court for his services. He is relieved from responsibility when the patient fails to follow his advice. He is responsible for negligence or ignorance on the part of his assistants, but not for criminal acts on their part. He is not responsible for errors of judgment in uncertain or difficult cases. *Edwin Welles Dwight.*

**MALT.**—(*Maltum*, U. S. P., 1880.) The official directions given in the United States Pharmacopoeia for the preparation of this product are as follows:

"Malt, in coarse powder, not finer than No. 12, one hundred (100) parts; water, a sufficient quantity. Upon the powder, contained in a suitable vessel, pour one hundred (100) parts of water and macerate for six hours. Then add four hundred (400) parts of water, heated to about 30° C. (86° F.), and digest for an hour at a temperature not exceeding 55° C. (131° F.). Strain the mixture with strong expression. Finally, by means of a water-bath, or vacuum apparatus, at a temperature not exceeding 55° C. (131° F.), evaporate the strained liquid rapidly to the consistence of thick honey. Keep the product in well-corked vessels in a cool place."

The almost universal employment of malt preparations, especially liquid malt extracts, by physicians and by the laity, warrants a critical study of their value from a therapeutic standpoint. This naturally implies an investigation of the composition of malt, its properties as a food substance from a physiological point of view, and finally, an estimate of its virtues alone, or combined with other medicaments, in the treatment of disease. And, inasmuch as there is a popular demand for these products, some reference should also be made to adulteration, and the addition of foreign substances, principally antiseptics, to prevent fermentation.

**COMPOSITION.**—The manufacture of malt consists essentially of four different processes, viz.: *Steeping, couching, flooring, and kiln-drying*, which result in decreasing the weight of the grain (about twenty per cent.), but are attended with an increase in bulk (three to eight per cent.). The entire manipulation should be considered to be successive steps of the same operation, since malting merely effects the transformation of the substances of the grain, through the influence of heat, moisture, and the amylolytic action of *diastase* (which see). Through the action of diastase—manifested within an hour after grain is put to steep—the insoluble starch of barley is converted into dextrin and glucose—sometimes called grape-sugar. Thus, the outline of Proust (*loc. cit.*) shows that malt contains nineteen per cent. less starch and cellulose than barley, ten per cent. more sugar, eleven per cent. more dextrin, while the amount of gluten is lessened by two per cent. It should be stated in this connection that, while the object of "malting" is to produce the maximum of sugar by the action of diastase, it is not desirable that this action should be entirely exhausted, and therefore, at a certain stage of the operation this process is arrested by kiln-drying; under favorable circumstances—heat and moisture—this fermentation is re-kindled.

Qualitative tests for *diastatic activity* are extremely simple. A quantity of malt is added to hot water, and dissolved by constant stirring; then a small portion of starch is added in like manner, and in the course of a few minutes the iodine test is applied.

The *soluble extract* in a good malt suitable for brewers' use, is, according to Ure, 66.8 per cent.; it contains, in addition, insoluble matter, 26.7, and moisture, 6.5 per cent. To determine the proportion of *insoluble matter*,

a definite quantity is measured by weight and dried by heat from boiling water; the remaining powder is then put in cold water and heated. The soluble extract is then decanted off and the residue dried and weighed and the percentage calculated.

The process of diastatic fermentation is by hydration (Hoppe-Seyler), as will appear later on.

Liquid malt extracts are simply weak solutions of ordinary malt, and usually contain a variable proportion of alcohol, a small percentage of carbonic acid, with more or less solid extract, but for none of them can be claimed any distinct diastatic property. These preparations hold in solution the products of diastatic activity, dextrin and sugar, which renders them "sweet" and palatable, while the alcohol is not in sufficient amount to interfere materially with the proper performance of the digestive functions; indeed, in the case of elderly persons, it may prove a decided benefit. Carbonic acid is also acceptable to the stomach; but the percentage of "solid extracts" in these products furnishes no criterion as to their intrinsic value, as will be shown presently.

From an examination and analysis of thirteen different samples of liquid malt extracts, Leffmann (*Medical News*, January 28th, 1893) found that all save one contained alcohol in small proportion—none as high as eight per cent.—and that the solid extract ranged from 5.1 gm. to 16.06 gm. for each 100 c.c. Moreover, three of the samples contained appreciable amounts of salicylic acid.

ADULTERATION.—The temptation to sophisticate malt arises from the great care required in the process of malting; if the diastatic power be destroyed by excessive heat, the malt possesses no nutritive or digestive value. Again, in sections of the country where malting is extensively carried on, manufacturers may employ "un-germinated" grain, *i.e.*, grain that has been subjected to "heating," and has thus lost its vitality. As a result of wet seasons, therefore, malt may be of a very inferior quality—possessing but slight diastatic power, yet showing a large percentage of insoluble matter.

Most serious objections are urged against the employment of salicylic acid as an antiseptic, since it is harmful if taken in too large quantities or too long continued, and besides, like all other antiseptics, it arrests or suspends diastatic activity. Now, while this is true in general, it may not apply uniformly to malt-takers and beer-drinkers, because we know that even in the absence of diastatic power this class generally present a rotund, florid, sometimes a bloated appearance—due to the deposit of fat from the absorption of sugar—and frequently suffer from rheumatic affections; hence the introduction of salicylic acid free from impurities may possess negative value: (1) by enacting the rôle of an antiseptic in the alimentary canal, (2) by lessening the diastatic activity, thereby preventing the rapid conversion of starch, and (3) by its influence upon the rheumatic diathesis. This leaves, then, for the liquid malt extracts containing salicylic acid, nothing of special value except the converted sugar and a small proportion of alcohol.

INCOMPATIBLES.—The following table (after Hermann Meyer and Brunton) is introduced to show the strength, in watery solution, of the different drugs which arrest the action of diastase, from which it will be observed that while chloroform and creosote, even in saturated solution, have very little or no deleterious effect, corrosive sublimate in a solution so weak as 1 to 50,000 destroys the ferment. Thus salicylic acid in the proportion of one grain to ten ounces (approximately) is sufficient to arrest the action of diastase:

Alcohol, 1 to 3.	Corrosive sublimate, 1 to 50,000.
Benzoate of soda, 1 to 100.	Creosote, no action in sat. sol.
Benzolic acid, 1 to 1,025.	Eucalyptus oil, acted only in excess.
Borax, 1 to 100.	Glycerin, 1 to 2.
Bromine, 1 to 5,070.	Iodine, 1 to 4,125.
Carbolic acid, 1 to 30.	Mustard oil, only lessens action in sat. sol.
Chloride of lime, 1 to 6,613.	Salicylic acid 1 to 5,100.
Chlorine, 1 to 7,411.	Sulphurous acid, 1 to 8,600.
Chloroform, slight action in sat. sol.	Thymol, slight action in sat. sol.
Copper sulphate, 1 to 6,500.	

PHYSIOLOGICAL ACTION.—From the preceding remarks it will be apparent that there is comparatively little to add in regard to the physiological action of malt, either from the standpoint of the clinician or from that of the physiologist; and yet that little is of paramount importance. Malt performs a twofold action in that it is a digestive and nutrient, its virtues being augmented by hydration. Digestibility is the prime element in all food-stuffs, but concentration may seriously interfere with absorption; hence the importance of dilution by water, which is the most efficient medium for the transmission of pabulum through the secreting structures of the alimentary tract (endosmosis). Thus, while concentration is an important factor entering into questions relating to the manufacture and transportation of food products, the very opposite is essential to insure rapid absorption and easy assimilation. But the increased consumption of carbohydrates, while it increases the amount of fat, is at the expense of muscular structures which require nitrogenous material for the maintenance of their integrity, and therefore too much dependence must not be placed upon the apparent gain secured by the administration of malt and predigested foods of this character. Indications of their unfavorable effects will be manifested by acidity, hepatic and cardiac derangements, and constipation, along with mental hebetude and other evidences of imperfect metabolism.

Contraindications to the employment of malt preparations in the treatment of children's diseases, more especially those peculiar to summer and autumn, should be noticed, *viz.*: evidences of fermentation in the stools. When this condition is present, carbohydrates must be omitted and nitrogenous food substituted.

The dangers arising from the small percentage of alcohol in the liquid malt extracts have been unduly magnified, as we have ample evidence of its value as a reconstructive. In suitable amounts—with meals—alcohol improves the appetite, favors digestion, lessens the elimination of phosphorus, and promotes the excretion of urea, thus enhancing muscular capacity; but we must bear in mind also that alcohol lessens oxidation—a conservative process in certain wasting diseases,—although an effect to be avoided in health. Its obtunding influence upon the nervous system is likewise of medicinal importance, and in the administration of malt preparations we should never lose sight of the physiological functions of the organism, our sole object being to restore and maintain its integrity by the exhibition of remedies adapted to its wants.

There is still another important factor to be considered in connection with the physiological functions of malt. For example, a considerable percentage of cod-liver oil can be incorporated with it in such a manner that the compound is tolerably stable while freely miscible with water, and therefore readily assimilable by the digestive apparatus. Now, bearing in mind that malt contains more or less gluten, perhaps a little dextrin, together with some unconverted starch and insoluble extract, it is not unreasonable to believe that under normal conditions the contents of the intestine may approach the type of a mucilaginous substance, possessing cohesive properties, and whose viscosity will prove of value in preventing the absorption of poisonous products from the alimentary tract. Physicians readily appreciate the value of starch enemata in irritable conditions of the lower bowel, although but few understand the *modus operandi* by which these benefits are secured. Starch enemata are of service, not merely because they have a quieting effect upon the terminal filaments of sensory nerves in the mucous structures, but rather on account of their adhesive qualities, which enable them to lay hold of poisonous substances in the course of elimination, thus preventing them from coming into contact with the delicate and inflamed tissues. While the old idea has long been accepted as a clinical fact, it was nothing more than a temporary hypothesis or makeshift, and is promptly set aside to make room for the scientific fact upon which it depends.

And just here should be pointed out the marked simi-

larity or analogy between the conditions which obtain in the small intestine when malt is administered and that of the lower bowel when a starch enema is introduced. This explanation not only sheds a new light upon the incidental physiological action of malt, but it puts the entire theory of the therapeutic action of emulsions upon a scientific basis, in keeping with the results of clinical observation. Heretofore the causes which were actually responsible for the wonderful improvement following the exhibition of comparatively small quantities of malt, cod-liver and petroleum oils, as well as other remedies in the form of emulsion, have been scarcely realized, because the physiological functions of the emulsifying agents were overlooked or but imperfectly understood. Notwithstanding the fact of its being a negative virtue, it is, nevertheless, a factor of material significance.

THERAPY.—The most important therapeutic application of malt consists in its employment for the relief of intestinal affections dependent upon imperfect intestinal digestion of starchy foods and subsequent fermentation. In this class of cases the carbohydrates should be restricted, bread only being allowed, and the patient instructed to masticate it thoroughly in order to incorporate with it the *ptyalin* of the saliva, which serves to break up the starch granules before entering the stomach.

Occasionally *amylase* may be added with benefit. This method of treatment will be found available in a very large number of cases of intestinal indigestion associated with chronic disease, especially pulmonary affections, because, as has already been shown, carbohydrates are fat-producers. They do not, however, increase the capacity of the muscular system, and may therefore do harm by lessening oxidation and obstructing elimination. Shortness of breath, cardiac weakness, or hepatic insufficiency with acidity of the stomach and diminished urinary excretion demand their prompt discontinuance and a complete rearrangement of the dietary.

Malt enjoys deserved popularity as an adjuvant in convalescence from protracted illness, as an auxiliary and digestive in the case of nursing women, and to a limited extent in the treatment of all debilitated conditions of the system; but its continuous or indiscriminate use will eventually result disastrously. Like all other remedial agents, its medicinal employment requires the discriminating judgment of the conscientious and intelligent physician.

In the treatment of summer diseases, in both adults and children, malt possesses a high degree of utility, but it is adapted only to the cases in which the stools are putrid and foul-smelling. When the stools are sour-smelling, due to starchy fermentation, malt and malted products are of secondary importance, as they have no influence upon the micro-organisms or other poisons associated with the intestinal disorder. Indeed, there is good reason to believe that the popular method of treating this class of affections by the exhibition of "barley water" has been productive of greater mortality rates than would have occurred had all treatment been abandoned. Science absolutely condemns the practice, and clinical observation emphatically indorses her teachings. The personal experience of Dr. Benjamin Ward Richardson, published in the *Aesclepiad* some years ago, covering the untoward effects of oatmeal and barley water, should be critically studied by every general practitioner.

ADMINISTRATION.—Malt (U. S. P.) may be given in doses of one or two drachms, either with meals or two hours later. Liquid malt extract should be given with meals—one or two wineglassfuls.

To meet special demands in the case of malnutrition, malt may be combined with a number of reconstructive medicaments, as follows: Malt with quinine, iron, and strychnine; malt with hypophosphites; malt with peptone; malt with cod-liver oil—but not to exceed the proportion of ten per cent. John Auld.

MALTA FEVER.—(Synonyms: Levant fever, Mediterranean fever, Neapolitan fever, Rock fever of Gibraltar, undulant fever, bilious remittent fever, etc.)

DEFINITION.—A disease of long duration, characterized clinically by fever, profuse perspiration, constipation, frequent relapses, often accompanied or followed by pains of a rheumatic or neuralgic character, sometimes swelling of joints or orchitis; anatomically by enlargement and softening of the spleen, congestion of the various organs, no enlargement or ulceration of Peyer's patches or other intestinal glands, and the constant occurrence, in various tissues, of a species of micro-organism—the micrococcus melitensis.

GEOGRAPHICAL DISTRIBUTION.—It occurs most frequently in the countries bordering on the Mediterranean, but these limits are being gradually extended. It has been recognized in certain parts of India, in one or two parts of the British Islands, and in Porto Rico. Strong has reported (*Philadelphia Medical Journal*, 1900) a case in Manila, Philippine Islands. Brunner (*Wiener klinische Wochenschrift*, 1900) describes a case which occurred in South Dalmatia. It has been found in the islands of the Caribbean Sea, and in Hong-Kong.

ETIOLOGY.—The micro-organism was first discovered by Bruce in Malta in 1887. It is never transmitted directly from person to person. With our present knowledge it is impossible to say how the poison gains entrance into the organism.

SYMPTOMS.—The period of incubation is not definitely known, but it extends probably from a few days to thirty. The onset is gradual, with feelings of malaise, constipation, headache, anorexia, perspiration, etc. This lasts for from one to two weeks, when the long and monotonous period of the fever begins. The patient is dull, apathetic, without delirium, and anæmic. Constipation is obstinate. The alternating febrile and afebrile periods which characterize the disease continue for from two months to two years. The temperature range shows intermitting waves or undulations of fever of a distinctly remittent type. These periods of fever last for from one to three weeks, followed by an apyretic period, or a period of abatement, lasting for from two to ten days. The daily curve may be intermittent or remittent. Profuse sweats attend the decline of the daily range. The spleen is very large. Although the temperature often ranges high, the patient has no delirium nor restlessness. Neuralgias occur in various parts of the body. The different joints of the body may become red, swollen, and tender, but suppuration in them does not occur. Orchitis may be troublesome and anæmia extreme. Vomiting is usually not marked but constipation is obstinate. Some bronchitis is almost always present.

Hughes divides the cases into four types: 1. The malignant type, which lasts for a week or ten days, and in which hyperpyrexia is marked. 2. The undulatory type, in which the fever goes in waves. This is the most frequent variety and the course of the disease is long. 3. The intermittent type, in which there is a daily rise of fever without other marked symptoms. 4. The irregular types.

PROGNOSIS.—The prognosis, so far as life is concerned, is favorable. The mortality is about two per cent.

DIAGNOSIS.—This can be positively made, according to Wright and later authors, by means of the serum agglutination reaction. Thus, in one case, on the tenth day of the disease, the blood serum showed a marked agglutination of the specific micro-organisms, in a dilution of 1 to 60, in the course of twenty minutes. Even higher dilutions than this have produced it. Aldrich states that the reaction first occurs on the fifth day. The serum of such a patient does not have any effect upon the typhoid bacillus nor upon other organisms. By puncture of the spleen with an aspirating needle one can obtain a clear colony of the micrococcus melitensis. Malta fever differs clinically from typhoid fever principally in being of longer duration, in the absence of the characteristic roseola, in constipation being the rule instead of diarrhoea, in the frequent presence of painful articular complications, in the much larger size of the spleen, in the absence of the diazo and Widal reactions, in the absence of the bacillus typhosus from the stools, in the free cerebrum, and