a pleuritic effusion, which is usually sero-fibrinous, is often not made until it has existed for some time. Another form is that of *acute tuberculous suppurative pleurisy*. Of this, Professor Osler, in his "Principles and Practice of Medicine," says: "The fact is not so generally recognized that there is an acute, ulcerative, and suppurative disease which may run a very rapid course. The pleurisy sets in abruptly, with pain in the side, fever, cough, and sometimes with a chill. There may be nothing to suggest a tuberculous process, and the subject may have a fine physique and come of healthy stock."

Tuberculosis of the pericardium is not so common as that of other serous membranes. It has been found *post mortem* when nothing during life had led to a suspicion of its existence. In other cases it has been accompanied during life with the ordinary symptoms of cardiac insufficiency or cardiac dropsy.

Tuberculosis of the kidneys and of the genito-urinary tract, as a primary lesion, is not very uncommon. The disease of the kidney gives the ordinary symptoms of pyelitis, with the presence of tubercle bacilli in the urine. It may persist for years while yet the patient enjoys fair health and shows no other signs of tuberculosis.

Tuberculosis of the testis may also, apparently, be primary, although undoubtedly depending on the presence of some other tuberculous focus within the body. It is early associated with the general symptoms of tuberculosis and should not escape recognition.

Tuberculosis of the lymph glands (formerly called scrofula) is one of the most common of the tuberculous affections and the one most likely to result in a spontaneous cure. The cervical glands are the ones most frequently affected. The general symptoms of tuberculosis do not appear, or do so only to a very slight degree. Fever is absent unless the extension of the disease is rapid or suppuration takes place. When the mesenteric glands are involved (tabes mesenterica) nutrition is seriously interfered with and rapid emaciation ensues, with the characteristic enlarged and tympanitic abdomen, diarrhœa, etc.

No reference need here be made to tuberculosis of the larynx, pharynx, nasal cavity, intestinal canal, or other parts, the involvement of which is secondary to pulmonary or other forms of the disease.

Bone Tuberculosis.—With regard to the general symptoms of this form of disease we quote from Tillmann's "Text Book of Surgery": "The general health in tuberculosis of bone is very often but little, or not at all, affected. There is frequently a slight fever, varying with the extent of the process. It is a common occurrence to find that the general health is only slightly disturbed, even when extensive multiple tuberculosis is present. In general the fever is most pronounced before the tuberculous inflammation has extended beyond the bone, but it is usually slight and, as a rule, disappears more or less completely when the inflammation has worked its way to the surface of the body." . . . "Quite often it happens that for a long time symptoms peculiar to bone tuberculosis are absent; severe pain, especially, may long be missed, unless a neighboring joint, the periosteum, or overlying parts, are attacked by the tuberculous inflammation. Symptoms generally do not appear for months."

Acute miliary tuberculosis, of the general or typhoid form, is a disease in which the various organs of the body generally are invaded by the tubercle bacillus and filled with miliary tubercles. The patient presents the symptoms of a most profound infection with few local manifestations of a characteristic kind. After a brief period of general indisposition, not unlike the prodromal stage of typhoid fever, the patient enters on the febrile stage, his temperature quickly reaching a height of 102° to 104° F. One of the main characteristics of the fever is its irregularity, with perhaps a morning rise and an evening fall, or two crises during the day, with a fall below normal, but, as a rule, with no chill. Some cases are said to run their course to a fatal termination entirely without fever. Leucocytosis is usually present. Pulse and respiration are quite rapid. Pulmonary symptoms may appear. Jaundice is not infrequent. Coma usually terminates the scene. In very rare instances tubercle bacilli are found in the blood.

TREATMENT.—Even without treatment, in any strict sense of the term, the restoration to health of people who have suffered from tuberculosis is no very unusual occurrence. As a matter of course this is more likely to occur under favorable hygienic conditions, but it does also occur, at times, under very unfavorable conditions. Much as it has been sought, and often as its discovery has been claimed, there is as yet no specific for this malady. Very much, nevertheless, has been accomplished during the past twenty years in limiting the spread of the disease, in prolonging life, and in effecting cures. When Koch announced his discovery of the tubercle bacillus, and shortly afterward introduced his tuberculin treatment, great hopes were entertained that "the white plague" was to be banished from the earth. Great as our disappointment has been, it must still be confessed that Koch's discovery has placed in our hands the power, to a great degree, of limiting the spread of the plague, and of thus, at least, beginning its extermination.

Prophylactic or preventive treatment, therefore, offers to-day the greatest field for activity, and holds out the best promise for favorable results. This implies, in the first place, the furtherance of everything that contributes to good hygiene; the abolishment of crowded tenements for the poor; the admission of fresh air, and above all of sunlight, into living-rooms and working-rooms everywhere; the limitation and regulation of child-labor and of the hours of labor for old and young; food inspection; instruction in cooking; provision for bathing facilities; and a thousand things besides that go to make healthy living possible. Not only must this possibility be placed within their reach, but the ignorant must be instructed as to the importance of these measures for health and for life. All this and much more belongs to the department of public health in states and municipalities, aided by the efforts of benevolent organizations, supported by the voice of the public press, and ceaselessly agitated by the medical profession everywhere.

In order that the tuberculous, and especially the phthisical, patient may become as little as possible a menace to the health of those about him, such cases should in all municipalities be reported to the board of health, not for the purpose of subjecting them to annoying surveillance, but that they and their friends may be instructed in a few simple rules for the safety of those who are well. Furthermore, after the death of a phthisical patient the room which he has occupied should be thoroughly disinfected.

Patients and friends should be instructed as to the vital importance of the destruction of all sputa of a phthisical person. Such persons should never spit anywhere except into a receptacle containing a germicide solution or into cloths or pasteboard cups which are afterward to be burned. The phthisical patient should, if possible, sleep in a well-ventilated room by himself.

Children or young people who have shown any suspicious symptoms, or those who are suspected of a possible predisposition to tuberculosis, should be brought up, as much as possible, in the open air and the sunlight. They should be hardened against exposure by daily cold sponging, be warmly clothed and well fed, sleep with open windows, and avoid all crowded rooms. The first signs of nose or throat troubles should be vigorously treated. Even the trifling ailments of such subjects should be given attention, and during convalescence from serious illness they should be carefully watched.

In cities and towns, and even in many villages, much of the regulation of public hygiene above referred to belongs to the boards of health. Even here such regulations will fail of their legitimate end unless faithfully and actively supported by the medical profession. But in all rural districts the practising physician is the board of health, the sanitary inspector, the police officer, as

well as the friendly counsellor of the family. When the entire medical profession in any land wakes up to the importance of the preventive treatment of tuberculosis, and takes the field in an active and relentless campaign against the spread of the disease, the results will be such as the greatest enthusiast has hardly dared to dream of.

In the treatment of tuberculous patients, where anything may be expected in the way of cure, or of the arrest of the symptoms, our main reliance, again, is on *good hygienic surroundings, proper and sufficient feeding, fresh air and out-of-door life*. By hygienic surroundings we mean absolute cleanliness, the avoidance of all dampness in dwellings, and the free admission of sunshine. The feeding problem is a hard one, since we have to do so often with people of small and capricious appetites. The diet should be simple, varied, and nutritious—milk, eggs, meats, cereals, breadstuffs, vegetables, with as much as possible of fats. Many patients who cannot eat very heartily at any one meal may gain in weight and in strength by eating six times a day—that is, by taking nourishment between meals in the shape of milk, broth, raw eggs, etc. As much of the daytime as possible should be spent out of doors, not in wearing one's self out by undue exercise, but much of the time by sitting or lying in the sunshine. Bedroom windows should be wide open at night, or, better yet, the patient, warmly bedded, should sleep out of doors, on a veranda, or on the roof, if need be, and if the roof happens to be flat. *No tuberculous patient ever died of out-door living, by day or by night, while thousands of lives have been saved by nothing else.*

Because of the difficulty of carrying out the methods above indicated in cities, or in regions where the climate is unfavorable to out-of-door living, we come to the question of the *climatic treatment* of tuberculosis, and of *sanatorium treatment*. Both of these subjects will be fully discussed, under their respective headings, by other writers in this HANDBOOK. Suffice it here to say that the best climate for the tuberculous patient is the one that furnishes pure, dry air, without excessive heat or dust, and the greatest number of days of sunshine during the year. If to this be added a more rarefied atmosphere, such as is found at an elevation of from three thousand to six thousand feet above sea level, and the conditions which supply a reasonable degree of comfort and good food, we have the ideal resort, at least for the consumptive. Such a climate and conditions are to be found notably in Colorado, in portions of New Mexico and Arizona, and in Western Texas.

Because of the extreme difficulty and often the impossibility of carrying out hygienic, dietetic, and other regulations while the patient remains at home, it might be expected that great advantage would accrue from the treatment of such patients at well-regulated sanatoria, whether private or public, and experience has proved that this expectation is realized. Even under unfavorable climatic conditions the results of sanatorium treatment have been most favorable, especially for that class of patients who cannot secure the best conditions at home. There is no charity that will so well pay the community for the capital invested as the establishment and maintenance of such institutions.

Medicinal Treatment.—As before stated, there is no specific treatment for tuberculosis. Tuberculin and all its modifications have, on the whole, proved failures. The same is true with regard to all the antitoxic serums and antiseptic injection preparations from which, one after the other, something has been hoped, but nothing realized. Medicated inhalations benefit a bronchitis, but never cure phthisis. Pneumatic cabinets have had their day. And so one might go on through a long list of disappointments.

Cod-liver-oil, that old stand-by, still does good where the stomach will tolerate it, and helps much in maintaining the general nutrition, which is a most vital point. It is undoubtedly of most marked value in bone and gland tuberculosis, especially in the young. It is best digested when administered in connection with malt extract.

Arsenic is the most valuable general tonic that can be given to the tuberculous, whether or not the claim holds true, which has been put forth by some, that it tends directly to make an unfavorable soil for the development of the bacillus.

Creosote and *guaiacol* have had the same claim advanced on their behalf, probably with no very good reason. It is not probable that any drug which is administered ever reaches the tissues in sufficient amount to modify their value as a culture ground for bacteria. But there is no denying the fact that these drugs lessen the amount of expectoration and relieve cough, without disturbing digestion or constipating the bowels, and so are a source of great comfort and benefit to the phthisical patient.

Iodine preparations are of undoubted value in gland tuberculosis. Lugol's solution, administered internally, iodide of potassium, or iodide of iron, are the forms most commonly used.

Surgical interference at certain stages of glandular involvement and in bone tuberculosis is imperative, and will be treated of elsewhere. Of late years operative procedures, in bone and joint tuberculosis, have been largely superseded by injections with or applications of *iodoform emulsion*, with most admirable results. In these cases iodoform seems to have a direct anti-tuberculous action. It is not too much to hope that before long similar injections into tuberculous lung cavities or areas may yield better results than they have in the past.

Details with regard to the treatment of individual symptoms of pulmonary or other forms of tuberculosis, however, do not belong to this article and will be given elsewhere. The general principles laid down above are applicable to all forms of the disease. It has been within the experience of the writer to see cases of tuberculosis of glands, of the urinary tract, and of the testis (the latter of which did not seem to have been arrested by operative removal), as well as of pulmonary tuberculosis, apparently cured by a change of climate, change in methods of living, good hygiene, and an outdoor life.

Edward W. Schauffler.

TUMENOL.—This compound, which is very similar to thiol, has also been proposed as a substitute for ichthyol. The mineral oils obtained by the fractional distillation of coal-tar are supposed to contain a class of unsaturated hydrocarbons, which are readily acted upon by sulphuric acid. These hydrocarbons, treated with concentrated sulphuric acid, constitute the active ingredients of tumenol. The hydrocarbons undergo sulphonation and are separated as a dark, thick liquid, containing sulphone and sulphonic acid, known as *commercial tumenol*. It is a dark brown, almost black fluid of a syrupy consistency, acid in reaction. *Tumenol-sulphone* and *tumenol-sulphonic acid* may be separated from the commercial tumenol by the addition of soda lye, which combines with the acid to form a soda salt. The tumenol-sulphone is a dark yellow, thick liquid. Tumenol-sulphonic acid is a dark powder having a peculiar, faintly bitter, taste. The therapeutic uses are the same as those of ichthyol and thiol. The commercial tumenol is that which is generally used. From this two forms of solution are prepared for use, one containing ten per cent. of tumenol in equal parts of ether and rectified spirit and water, and the other containing glycerin in the place of the water. It may also be used as an ointment. The tumenol-sulphonic acid is employed as a powder, or in solutions, of the strength of one or two per cent.

Beaumont Small.

TUMORS.—(Synonyms: Common synonymous terms are new-growths, neoplasms, malignant disease, blastomata.)

DEFINITION.—It is difficult to give a clear, exact definition which will apply to the term *tumor* under all conditions, because the word, which etymologically simply means increase in size, has a clinical and a general as well

as a strict anatomical use. For example, clinically, increase in the size of a part has been and is now designated as tumor, as when we say that the four classical symptoms of inflammation are rubor, calor, tumor, dolor.

The word is employed in a vague general way when we apply the term acute or chronic splenic tumor to a spleen which is enlarged in consequence of an acute or chronic inflammatory process.

In the narrow sense of the word a tumor may be defined as a more or less circumscribed new formation of tissue, for which no cause can be assigned, and which, either in its growth, or in its relations, or in the character of its elements, departs more or less from the type of the normal tissues of the body. It possesses independent or autonomous growth without physiological limitations and serves no physiological purpose.

Tumors approach on the one hand the processes of regeneration and repair, and, on the other, certain inflammatory processes (sometimes called infectious tumors), which are due to definite causes. They also stand in close relationship with certain embryonic displacements of tissue, malformations, and inclusions from which it is not always easy to distinguish them.

The principal difference between infectious tumors and true tumors is this: In a metastasis of an infectious tumor the parasite which has caused the new growth is carried elsewhere and incites the tissue where it lodges to the formation of new tissue, which resembles that in the primary growth: in the metastasis of a true tumor a cell or group of cells of the original tumor is carried elsewhere and by its own growth produces a secondary nodule which resembles the primary growth.

Tumors vary much in *size*, from microscopic nodules to masses weighing more than the body itself. They also vary greatly in *shape* because they are influenced by many conditions. A tumor growing in the interior of a solid organ, and growing equally on all sides, is round, but if it projects into a cavity, it usually adapts itself to the shape of that cavity if the latter is small enough to exert pressure. Tumors situated near the surface of an organ usually find less opposition to growth above the surface, and hence may project more or less above it, or even be connected with it only by a slender pedicle bearing blood-vessels. Tumors developing in the wall of the uterus remain there, or project into the peritoneal cavity or into the cavity of the uterus, according to their situation in the centre or near either surface of the wall.

The majority of the tumors are grayish to white in *color*, but many other colors, such as yellow, pink, red, brown, black, and green, are sometimes seen, and a few of them are fairly characteristic, as the green of the chloroma and the brown and black of the melanoma.

The *consistence* of tumors varies from the hardness of bone and the density of fibrous and myomatous tissue to the flabby toughness of the œdematous fibroma and the soft juiciness of a rapidly growing sarcoma.

Structure.—All simple tumors consist of two parts,—of the tumor cells, which may or may not secrete an intercellular substance, and of a stroma furnished by the tissue in which the tumor grows, in consequence of a physiological demand for nutrition and support made by the tumor cells. The stroma consists of blood-vessels which usually are accompanied by a varying number of connective-tissue cells and their intercellular substances. The blood-vessels are often of the simplest type, and in some tumors may consist of endothelium only.

A few examples will make this difference between tumor and stroma clear. In an adenoma or carcinoma the epithelial cells are the tumor cells; they alone are necessary to form metastases. All the cells of the connective-tissue stroma and of the blood-vessels present both in the original growth and in the metastases are intimately associated with the tumor cells, but they are furnished by the tissue in which the epithelial cells are proliferating. They do not invade surrounding tissues or give rise to metastases.

In a glioma the neuroglia cells, with their characteristically staining fibrillæ, can readily be separated from the stroma, *i.e.*, from the blood-vessels and accompanying connective tissue. But in many connective-tissue tumors, such as a fibrosarcoma, for example, it would be difficult to say whether certain cells along a blood-vessel were true tumor cells or only connective-tissue cells of the stroma. In a myoma it is impossible to say at present whether the reticulum that surrounds all of the muscle cells is the product of the connective-tissue cells of the stroma or of the smooth muscle, *i.e.*, tumor, cells themselves. The latter conception seems the more probable one.

In some tumors, such as carcinomata, the cells of the stroma often show such marked proliferative tendencies that their increase must be regarded—partly at least—as a reactive inflammatory rather than a simple physiological growth.

Growth.—Tumors start from a single cell or group of cells and grow by proliferation of those cells. They do not infect other cells and cause them to turn into tumor cells. In their growth they follow the same laws of cell proliferation that hold in normally growing or regenerating tissues. Hence in all rapidly growing tumors mitotic figures are very common, and the number of them present in a given tumor furnishes the best means of judging its rapidity of growth. Irregular and multiple mitotic figures are common, but are not characteristic of tumors, as it has been shown that they occur also in active regenerative processes.

A tumor has two modes of growth. In the one, which is called *interstitial expansive growth*, the tumor grows simply as a mass, pushing aside the tissues with which it comes in contact. Such tumors are very frequently surrounded by a sort of capsule of connective tissue which separates them from the surrounding tissue and through which pass the vessels of the tumor.

The other method of growth is by *infiltration*. In this case the tumor does not grow as a mass, but, probably because it finds better nutritive conditions or less resistance to growth in certain places, the cells of the tumor press into these places and infiltrate the surrounding tissue. In these cases a naked-eye examination cannot determine the limitation of the tumor; for a tissue which appears normal to the naked eye may be infiltrated with rapidly growing cells of the tumor.

The effect of tumors on the surrounding tissues is often to cause degenerative, inflammatory, and regenerative processes.

Metastases.—A tumor developing in a certain organ or tissue may remain solitary. In other cases a number of tumors of similar structure may develop later in other parts of the body. The tumor in the place of origin is called a primary tumor. The tumors in other parts of the body, which are derived from and develop in consequence of the primary tumor, are termed metastases. These metastases are due to cells or parts of the tumor being carried by the lymphatics or by the blood-vessels into other parts of the body, where they develop, forming tumors similar in character to the primary growth. It is not at all uncommon to find tumors growing into the vessels or lymphatics. They may fill up and grow along them, or the single cells may be carried in the current. Where these metastases take place will depend upon the blood and lymph circulation, and also to some extent on the tissue in which the cells lodge. If the tumor grows into a lymph vessel, then the cells will be carried into the lymph nodes connected with the part from which the tumor arises, and the metastases will develop in them. We have an example of this in carcinoma of the axillary lymph nodes following carcinoma of the breast; or in metastases in the pelvic lymph nodes following carcinoma of the uterus, etc. When the tumor cells enter into the blood, they are carried into the nearest capillary circulation, where they remain and develop metastases. Thus we have metastases in the lungs when the cells enter the systemic circulation; metastases in the liver when the cells enter the portal circulation. In case the tumor growth takes place in a large space, such as the pleural or peritoneal cavity, the cells of the tumor

may get free and be carried to various places over the surface, giving rise by *implantation* to secondary tumors. This is seen often in tumors of the ovary, which may rupture into the peritoneal cavity and produce numerous small tumors over its surface. These secondary nodules, due to implantation, are also common secondary to carcinoma of the stomach. The cells are distributed by the movements of the intestine.

Recurrence of a tumor in the original site is due to incomplete removal of the primary tumor. This is sometimes due to the fact that the tumor is so situated that it is difficult to get at. A good example is offered by fibromata of the nasopharynx. If a tumor shells out easily, the surgeon is likely to think that he has the whole of it, when, as a matter of fact, the surrounding tissue may be invaded in various places.

The danger of recurrence, in the case of carcinoma, is so well known and feared that a generous margin of apparently normal tissues is always removed with the tumor.

Multiplicity.—Most tumors develop in but one situation in the body at once, but following this primary tumor there often are secondary new growths, due to metastases. Certain tumors, however, frequently are multiple and each nodule is independent of the other in its origin; for example, multiple myomata of the uterus and multiple fibromata of the skin. Less commonly lipomata and angiomata may be multiple. Tumors of the kidneys and ovaries are not infrequently bilateral in origin. Some tumors, such as the malignant lymphomata, spread so quickly that they seem to have a multiple origin, but probably do not.

Multiple tumors of different structure occurring at the same time in one individual are rare and must be regarded as accidental coincidences.

The *nutrition* of tumors takes place by means of blood-vessels which are developed from the blood-vessels of the part in which the tumor arises. The development of blood-vessels and the enlargement of the old blood-vessels from which the new ones arise take place according to the laws of nutrition. Wherever there are numbers of multiplying cells demanding greater nutrition new blood-vessels will develop to supply this demand.

In general the vessels of tumors have the same character as the normal vessels, but in certain of the sarcomata the blood-vessels are more irregular in character and may be represented by mere fissures lined with endothelial cells.

The vascular supply of a tumor is dependent largely on the rapidity of growth. A tumor which is growing rapidly has a much larger vascular supply than a tumor which is growing slowly.

A tumor is able to make greater demands for its nutrition than the normal tissues of the body. It is not at all uncommon to find rapidly growing tumors developing in people of advanced age in whom the general nutrition of the body is poor, and in whom the processes of regeneration and repair are at a low ebb. Tumors composed of fat tissue may develop and may grow in individuals in whom, owing to disease, the subcutaneous and other fat of the body has almost entirely disappeared. Conditions of malnutrition, which may influence the nutrition of all other tissues of the body, have no effect in retarding the growth of the tumor.

Phagocytosis.—The cells of some of the rapidly growing tumors are often phagocytic for other cells, particularly leucocytes. The partially digested remains of these cells lying within vacuoles in the protoplasm form inclusions of various shape and size which have often been mistaken for protozoa, especially in carcinomata.

In the malignant lymphoma many of the tumor cells are taken up and destroyed by the large endothelial cells lining the reticulum.

Various forms of *degeneration* are common in tumors. In consequence of the often extreme rapidity of growth of the cells the blood-vessels may become compressed, leading to fatty degeneration or necrosis. The veins passing out from a tumor may become constricted so that intense congestion and hemorrhage may occur in certain parts, or hemorrhage may follow the rupture of imperfectly developed vessels. The necrotic tissue in tumors has the same attraction for leucocytes as in normal tissues. Ulceration is not at all uncommon in tumors on the surface of the body, especially where they project more or less, and it almost invariably occurs in tumors involving mucous membranes. Invasion of tumors by suppurative and other bacteria is fairly common.

Certain tumors tend to produce in the body a state of marked malnutrition, which is termed cachexia. The cachexia may be accompanied by such definite forms of metamorphosis as the amyloid. This malnutrition is due to a number of causes. In the first place, it may be brought about by the presence of tumors in certain places where they will interfere actively with the general nutrition; for example, tumors may lead to stricture or to closure of the alimentary canal. Secondly, tumors by the products of their own degenefation, or by toxic products due to invasion by bacteria, may produce retrograde changes. Thirdly, pain, loss of sleep, and the anxiety produced by a malignant tumor will interfere with nutrition.

The *diagnosis* of a tumor cannot be made from isolated cells alone: there are no cells which are characteristic, for example, of carcinoma or of sarcoma. The diagnosis of a tumor depends on the arrangement of the cells of which it is composed with relation to each other.

The *classification* of tumors is a subject of much difficulty. This is due chiefly to three causes: to our lack of knowledge regarding their etiology, to the great diversity in their structure, and to the present incomplete histological study of them. There is unquestionably a large field for future discoveries in the microscopic study of tumors.

It is often convenient to divide tumors into those which are *malignant* and those which are *benign*. Clinically, the division may have a certain justification, but it can never be made exact, because any tumor may be malignant in consequence of its situation in the body, although ordinarily in consequence of its slow growth, its encapsulation, and its lack of metastases, it would be classed as benign.

Virchow divided the true tumors into the following three groups:

1. *Histoid tumors*, those into whose structure only one tissue of the body enters (fibroma, osteoma, etc.).
2. *Organoid tumors*, those into whose structure several tissues enter (adenoma, carcinoma, etc.).
3. *Teratoid tumors*, those into whose structure whole systems of the body enter.

These divisions were further systematically subdivided and the tumors classified according to the normal tissues which they resembled.

From another point of view tumors are sometimes divided into the two following classes:

1. *Homologous tumors*, those which resemble the tissue from which they arise.
2. *Heterologous tumors*, those which are unlike the tissue from which they arise.

Both histoid and organoid tumors may be homologous (a chondroma from the cartilage of a joint or an adenoma from the mammary gland) or heterologous (a round-cell sarcoma from the peritoneum or a carcinoma from the stomach). It is important to bear in mind that homologous and heterologous are not synonymous with benign and malignant.

Virchow's classification of tumors into three groups is practically followed by many pathologists at the present day, although the headings of the groups are usually changed into the following:

1. *Connective-tissue tumors.*
2. *Epithelial tumors.*
3. *Mixed tumors.*

The objections to this classification are that the word epithelial is used partly to refer to the character of the cells, partly to refer to a tissue derived from the ectoderm, as when a glioma is said to be of epithelial origin.