The present division of tumors is into, first, those formed of *connective tissue* elements in various stages of development; and second, those formed of *epithelial* structures.

The presence of the so-called *cancer cell* or *spindle cell* was formally regarded as the certain evidence of a malignant growth, and until a period within the last ten years was so taught in our medical schools.

This spindle cell is also found in normal connective tissues, in embryonic tissues, cicatrices, etc., and although such distinguished histologists as Virchow, Billroth, and Rokitsky have endeavored to find a special cell indicative of the malignant nature of cancer, they have never succeeded. All are agreed that cancer should not be regarded as anything distinct, and that its cell elements are either identical with the embryonic or with the fully developed tissues.

The simplest form of tumor is found in granulating tissue, or what is commonly known as *proud flesh*.

When we make a section of such a neoplasm we find the cells present the simple round appearance analogous to the embryonic connective-tissue cell and precisely identical with the cells of the round-celled sarcoma. A similarity also exists in the blood-channels of the round-celled sarcoma and embryonic tissue, they being without walls.

By throwing out prolongations and contraction of the embryonic cell condition the connective tissue cells are formed, and in granulating surfaces which go on to healing, we find the cicatrix made up of or containing the spindle cells. These two forms of cells, the one as found in simple granulating surfaces as well as in the round-celled sarcoma, the other as found in connective tissue and in the spindle-celled cancer have the power of inflicting the tissues. In this consists the special malignant characteristic. The apparent presence of the round cells in the spindle-celled tumors is owing to the transverse sections of the interlacing spindle cells, and are always so regarded.

The nature and character of the lipoma or fatty tumor, the osteoma and various tumors from admixture of these elements were referred to by the lecturer.

The fibroma was described as a tumor which in itself did not produce any dangerous symptoms, but might, indirectly, by its position.

The recurrent fibroma of the English surgeons must be looked upon as an encapsulated spindle-celled sarcoma, and the recurrence *in loco* of the tumors must be explained by the presence of tumor elements in the tissues outside of the capsule, which elements have the power of reproducing the neoplasm.

The second class of tumors, the epithelial, were then considered.

By irritation of the epithelial elements, or when the nutritive processes are actively stimulated, we have an undue development of these cells outward, constituting the form of tumor known as the papilloma or *wart*, the simplest form of epithelial tumor.

By the same process, limited by the thick and hardened epidermal layers at a later period of life, the cell growth extends inward in the direction of the least resistance, and the form of tumor known as the epithelioma results.

The adenoma or glandular tumors present the appearance of increased glandular elements. The proliferating epithelial cells may however fill up and enlarge the acini to such an extent that finally the limiting membrane is broken through, and the cells continue to grow into the adjacent connective tissue, where we find nests of proliferating cells, usually of an elliptical form, from being pushed forward.

When the connective tissue predominates, or is greatly increased in amount, a hard scirrhous cancer will result. If the connective tissue fails to increase, and the epithelial cells develop to such a degree as to wither or overbalance it, then these cells, also breaking down from pressure, etc., form the soft variety of cancerous tumor. In conclusion, the lecturer said, the chief point which he desired to bring before the gentlemen of the academy was, that there is no such thing as a *cancer cell*, and whether malignant or not depends upon the infiltration of the new cell growth, position of the cell growth, and secondary deposits. The lecture was illustrated by diagrams and by a large number of beautiful slides showing the different varieties of tumors and their histological details. At the close remarks were made by a number of gentlemen.

Dr. Alfred Reed gave as a reason why the lungs are a favorite seat of secondary cancerous deposits, that they are formed by the same germinal layer of the embryo as the bones.

In reply Dr. Seiler said that tumors not originally situated in bones form secondary deposits of the lungs, and on the other hand, tumors of the bones form secondary deposits in other internal organs, and especially in glandular organs. He further said that it needed but a very few of the tumor elements carried to a distant point by either the circulation of the blood, or, as is more frequently the case, by the lymphatic circulation, in order to start a new point of development.

In proof of this the lecturer related some experiments lately performed in Germany, in the course of which a few cartilage cells taken from a cartilaginous tumor were ingrafted upon the cornea of a rabbit and also in the muscular tissue of another animal of the same species, which formed the starting points for similar growths as that from which they had been taken.

Other communications were received from members of the section. Mr. Potts presented a living specimen of *Cristatella lida*, lately described at a meeting of the Academy by Prof. Leidy. Mr. Walmsley, of the firm of R. & J. Beck, presented for examination an improved microscope, compact and economical, which could be used for dissecting and as a compound instrument.

On motion it was decided to hold the Annual Microscopical Exhibition on the first Monday of November.

TREATMENT OF THE DROWNED.

TWO THINGS TO BE DONE: RESTORE BREATHING; RESTORE ANIMAL HEAT.

RULE 1. Remove all obstructions to breathing. INSTANTLY loosen or cut apart all neck and waist-bands; turn the patient on his face, with the head down hill; stand astride the hips with your face towards his head, and, locking your fingers together under his belly, raise the body as high as you can without lifting the forehead off the ground (Fig. 1), and give the body a smart jerk to remove mucus from the throat and water from the windpipe; hold the body suspended long enough to slowly count ONE, TWO, THREE, FOUR, FIVE, repeating the jerk more gently two or three times.

RULE 2. Place the patient face downward, and maintaining all the while your position astride the body, grasp the

points of the shoulders by the clothing, or, if the body is naked, thrust your fingers into the armpits, clasping your thumbs over the points of the shoulders, and raise the chest as high as you can (Fig. 2) without lifting the head quite off the ground, and hold it long enough to slowly count ONE, TWO, THREE. Replace him on the ground, with his forehead on his flexed arm, the neck straightened out, and the mouth and nose free. Place your elbows against your knees and your hands upon the sides of his chest (Fig. 3) over the lower ribs, and press downward and inward with increasing force

long enough to slowly count ONE, TWO. Then suddenly let go, grasp the shoulders as before and raise the chest (Fig. 2); then press upon the ribs, etc. (Fig. 3). These alternate movements should be repeated 10 to 15 times a minute for an hour at least, unless breathing is restored sooner. Use the same regularity as in natural breathing.

RULE 3. After breathing has commenced RESTORE THE ANIMAL HEAT. Wrap him in warm blankets, apply bottles of hot water, hot bricks, or anything to restore heat. Warm the head nearly as fast as the body, lest convulsions come on. Rubbing the body with warm cloths or the hand, and slapping the fleshy parts, may assist to restore warmth and the breathing also. If the patient can SURELY swallow, give hot coffee, tea, milk, or a little hot sling. Give spirits sparingly, lest they produce depression. Place the patient in a warm bed, and give him plenty of fresh air; keep him quiet.

BEWARE!

AVOID DELAY. A MOMENT may turn the scale for life or death. Dry ground, shelter, warmth, stimulants, etc., at this moment are nothing—ARTIFICIAL BREATHING IS EVERYTHING—is the ONE REMEDY—all others are secondary.

Do not stop to remove wet clothing before efforts are made to restore breathing. Precious time is wasted, and the patient may be fatally chilled by the exposure of the naked body, even in the summer. Give all your attention and effort to restore breathing by forcing air into and out of the lungs. If the breathing has just ceased, a smart slap on the face or a vigorous twist of the hair will sometimes start it again, and may be tried incidentally, as may, also, pressing the finger upon the root of the tongue.

Before natural breathing is fully restored, do not let the patient lie on his back unless some person holds the tongue forward. The tongue, by falling back, may close the windpipe and cause fatal choking.

If several persons are present, one may hold the head steady, keeping the neck nearly straight; others may remove wet clothing, replacing at once clothing which is dry and warm; they may also chafe the limbs, and thus promote the circulation.

Prevent friends from crowding around the patient and excluding fresh air; also from trying to give stimulants before the patient can swallow. The first causes suffocation; the second, fatal choking.

DO NOT GIVE UP TOO SOON. You are working for life. Any time within two hours you may be on the very threshold of success without there being any sign of it.

In suffocation by smoke or any poisonous gas, as also by hanging, proceed the same as for drowning, omitting effort to expel water, etc., from the windpipe.

In suspended breathing from effects of chloroform, hydrate of chloral, etc., proceed by Rule 2, taking especial pains to

keep the head very low, and preventing closure of the windpipe by the tongue falling back.

The foregoing method, originally published by the State Board of Health of Michigan, has the sanction of other State and City Boards of Health, and is fully indorsed by the State Board of Health of Connecticut, and printed for general distribution as a life-saving measure.

INSECT PESTS IN LIBRARIES.

By DR. H. A. HAGEN, Professor of Entomology in Harvard University.

HAVING been invited to make a communication on the insects injurious to books and libraries, I am obliged to be very brief, even more than I should like to be, owing to the fact that most of the publications are not accessible here. An application to the National Library was without success, and there was not time enough to get an answer from Europe. Therefore it will be easy to observe the three golden rules for a speech given by Dr. Martin Luther:

"Open thy mouth widely.
Shout out strongly,
Shut it quickly!"

The first fact on record is given by Pastor Frisch in Berlin, who had observed the small larva of a beetle (*Anobium*) perforating transversely the thickest books. It makes a network of small passages, and, in some places, larger holes for its transformation.

This larva, as common here as in Europe, is the same which even now every library has to fight. The injuries observed by Frisch are well known to every librarian, and are to be found in old and seldom-used books. I saw once myself a whole shelf of theological books, 200 years old, traveled through transversely by some more adventurous larva.

Some twenty years later injuries must have been oftener observed. At least Mr. Prediger, in Leipsic, was induced to write, in 1741, a book of advice to bookbinders, which was republished in 1772. We find from an extract in the *Gentleman's Magazine*, May, 1754, that if the bookbinders were to make their paste of starch instead of flour, worms would not touch the books. He also recommends pulverized alum mixed with a little fine pepper to be put between the books and the covers and also upon the shelves—which would certainly transform such a library into a gymnasium for sneezing. For the more effectual preservation of books, he advises to rub the books well in the months of March, July, and September with woolen cloth dipped in powdered alum. I think he might have advised with equal propriety to rub the books with the second finger of the left hand, as the inspection of the books is the only important point of the advice.

The *Gentleman's Magazine* adds that it is remarkable that worms seldom attack books printed on English-made paper. It is overlooked in this statement that until 1690 only packing paper was made in England, and all other kinds of paper were imported from Holland. Therefore no old books, which are attacked by preference, printed on English-made paper, then existed.

Some years later the library in Göttingen seems to have been troubled in a serious manner. The Academy of Göttingen has published three prize essays on insects obnoxious to books, by Mr. Hermann, M. Fladd, and one anonymous writer. All three were reprinted in contemporaneous magazines, and many extracts made from them. I have not met with any of them here, and know nothing but the titles. The remedies proposed must have been very effective, or the insect decided to move into more hospitable quarters, as since that time nothing further is stated about such pests in Germany.

A few general rules for the preservation of libraries are given in the same year by Mr. Meinike. As a curiosity, I may be allowed to quote the substance of them. The rooms in which the books are ought to be heated, but as it is not possible to heat large libraries, the more costly manuscripts and incunabula should be kept in a small, warm, and at the same time well-ventilated room. Obnoxious insects should be trapped by water and lard placed in some rooms of the library. The rules conclude with the following words: It will not be necessary to do anything against insects excepting where a library takes only the place of tapestry or other decoration of the walls without being used. I have to state that the little beetle (*Anobium*) is the same which is so obnoxious to old furniture and old picture frames. No wonder that it considers old, not used books, as old furniture. The custom of preserving in libraries historical pieces of furniture is, therefore, probably a disadvantage for the books. Some papers for Sweden, France, and Italy I was not able to consult; they prove at least that in those countries mischief has been done to Swedish libraries. Linnaeus speaks about a beetle (*Ptinus fur*) which had been very obnoxious to libraries in 1760; French reports speak of mites which cackle like hens, eat the outside covers of books and live on the paste, a kind of insect unknown to me. A memoir, by Pozetti, for Italy in 1809, is also known to me only by the title.

A species of white ants living in the most southern and western parts of France made immense ravages between 1825 and 1835. The little insect known only as living under stones or in old, decayed trees, had until this period never been injurious. Even its apparition in myriads after the falling in of an uninhabited house in Rochefort did not draw the attention of the people to the danger. Some time afterward more accidents happened. In a boarding house a whole dinner party fell suddenly from the third story down into the cellar. The attention of the government was drawn finally to the danger by the destruction of the naval archives and of the library of the marine department. It was necessary to secure every book and paper in tight-closing tin boxes. Constant attention proved to be the only remedy. Some years later the insect did less damage, and disappeared, as insect pests commonly do, without any apparent reason. The insect exists still in those parts of France, but without being obnoxious.

Concerning America, the facts published are few. Dr. L'Hermiet, a surgeon in Guadeloupe, has made a somewhat detailed report about the ravages done by a beetle called by him *Dermestes chinensis*. Everybody complained of the destruction of books, and the doctor himself lost about 4,000 volumes. The only remedy used with success was mercury in different kinds of preparation, surely not without danger for the owner of the books. Several interesting remarks are added. Some older books were exempt from injury, probably because the paper was made of different material. New books were only attacked after they had absorbed the humid air of the island and had become distinctly heavier.

Probably the same beetle made the extensive ravages in Cuba, about which Professor Poey in Havana has published a memoir. He calls the insect *Anobium bibliothecarum*. I am sorry to state that a reliable determination of both insects is still wanting.

The facts given so far seem to be rather harmless, but I cannot refrain from drawing the attention to the presence of white ants here and everywhere in the United States, sometimes, as, for instance, in Cambridge, in the neighborhood of libraries or university buildings harboring valuable special libraries. I am obliged to state that twice in the United States books have been destroyed by white ants to a hopeless extent. In Springfield, Ill., fourteen years ago, all the bound spare copies of the State papers were stored in a closed room in the State House, and not looked after for some time. When the room was opened all were found in a mutilated condition.

Some years ago a Boston lady, a teacher in one of the freedmen's schools in South Carolina, who had gone away for a vacation of six weeks, found, on returning, the whole library of Bibles and prayer books destroyed. The copies kindly forwarded to me were less damaged, and therefore retained.

Perhaps the allusion to a danger which has only existed in exceptional cases may seem too darkly colored or even sensational. This, of course, has not been my intention. But we must know that we live surrounded by such enemies, and that great destruction can be effected. The circumstance that our white ant is very closely allied to the French species, which lives in a similar manner, and was for a century

As far as I can judge by the reports of large and small libraries, more than the third part, even in the larger libraries, is intended for frequent circulation, and, indeed, does circulate very rapidly. This part needs, of course, no prevention at all. The second and third is intended for the advance of knowledge, and is used more or less frequently for this purpose. Here begins the necessity of a stronger supervision of the books.

The third part, finally, consists of books which are less used, often only once in a year, or even in several years. Nevertheless, such books cannot be omitted by libraries. This part, indeed, needs the greater care, the more so as it consists mostly of rare or costly books. There are sometimes very rare books injured by *Anobium*. The different methods employed to kill the larvæ are mostly not indifferent, at least for the binding. I should like to propose here a remedy perfectly harmless and perfectly efficient, namely, to put such rarities under the glass bell of an air pump and to draw out the air. After an hour the larvæ will be found killed. Of course this is only to be applied to rare books or costly bindings.

If we recapitulate briefly what is so far known about insects obnoxious to libraries, only two insects remain—the well-known *Anobium* and the white ant. I say only two, leaving aside the cockroach, as libraries will not often be stored in cellars. The beetles will certainly not do any notable injury if the books are used frequently. Against white ants, which would be an exceptional danger, constant attention would be the only remedy.

Some precautions against them are published by myself

undergoes at every month. At the beginning of the year 1878, the Acclimatization Society, having procured a large number of cocoons of this pretty Saturnian, distributed them with its well-known generosity, and one of my friends and colleagues, M. Berce, received a certain number of them. He awaited the appearance of the moths, obtained a coupling of the sexes, and subsequently some eggs, part of which he offered to me, and we both made our preparations to bring the rearing of the insects to a successful issue. The first individuals that M. Berce saw appear were all males, and the last were all females, so that the number of sexual unions was quite limited. The able entomologist hastened to prick the fecundated females, under the impression that this process would oblige them to lay their eggs more completely and rapidly. From this there resulted eggs in pockets; and this, we will observe, does not usually take place in nature with our large Bombyces—*Attacus pyri*, for instance, which lays its eggs in very small groups on the trunk and branches of fruit trees, and *Attacus cynthia*, the pretty Chinese moth now completely acclimated in France, and the female of which lays rows of six, eight, ten, or more eggs on the back of ailantus leaves. The eggs of the *Cecropia* resemble those of the majority of the large species of *Attacus*, such as the Yama-Mai and Pernyi, and are yellowish, irregularly spotted with brown. The little caterpillars which issue from them about a dozen days after they are laid are black and have spiny tubercles of the same color. Before long, some are noticed that have two rows of dark-yellow dorsal spots. On attentively observing, M. Berce and I thought that we saw here evidences of a first

FIG. 1.—ATTACUS CECROPIA.

1. The Eggs.—2. Caterpillar on issuing from the egg.—3. Caterpillar after the first moult.—4. Caterpillar after the second moult.—5. Caterpillar after the third moult.—6. Caterpillar after the fourth moult.—7. Caterpillar after its fifth moult: mean size at the period of spinning.—7a. Its tubercles.

FIG. 2.—ATTACUS CECROPIA,—COCOON AND MOTH.

innocuous till it suddenly became a formidable pest, makes the knowledge of the danger imperative. It should not be forgotten that Alexander von Humboldt stated half a century ago that the rarity of old books in Mexico was in consequence of the depredation of white ants.

Only a few days ago I received from Mr. J. A. Lintner, of Albany, N. Y., the following written communication: "The book which I spoke to you as injured by cockroaches bears the following memorandum: 'Presented to the State Cabinet by Antonio de Lacerda, to illustrate the works of *Blatta Orientalis*, January 2, 1807.' It is an English pocket dictionary, bound in cloth. The back and sides are eaten in patches through the enameling down to the threads of the cloth. As it stood on the shelf, the cover must have been partly open, and at the outer edge of this the paper lining had been eaten for the space of about one-quarter of an inch along the entire margin to get at the coating beneath."

"Some years since we had a large edition of one of our Museum Reports stored in the basement. The cockroaches, which infested this part of our building, attacked the backs and the exposed cover of each upper volume, eating through the coating of the cloth, as above described. The edges of the volumes were also badly soiled by their excrements. This injury could be removed by the binder with sandpaper, but no way was known by which the other could be remedied. Perhaps a hundred volumes were so badly injured that we do not like to distribute them."

Perhaps it may be too assuming, and too much like bringing coals to Newcastle, to propose a few regulations for libraries in the presence of librarians to whose care are intrusted libraries comprising millions of volumes.

in the *American Naturalist* for 1876. I am happy to acknowledge that so far no serious damage has been done to libraries here by obnoxious insects.—*Library Journal*.

THE REARING OF A SILK-PRODUCING MOTH.* (*Attacus Cecropia*.)

FOR a long time past attempts have been made in Europe to rear several exotic species of the Bombycidae. Sometimes this has been done for the purpose of acclimating them, and in the hope of utilizing the silk which they all produce, and which, notwithstanding its usually gray color, might possibly serve for the fabrication of goods possessing remarkably solid qualities. But it is not the economic side of the question entirely that leads most amateurs to make such experiments. It is rather the pleasure of seeing issue forth from their cocoons those superb gigantic moths whose wings are ornamented with colors and designs so different from those exhibited by our native species of Bombyx.

Their caterpillars, too, are very beautiful; and, aside from the difficulty met with in Paris in procuring a sufficient quantity of the oak upon which the majority feed, they are generally easy to rear, being slow in their movements and quitting the leaves but little, thus allowing of their being left in the open air on branches simply placed in a bottle of water. We have had the good fortune to rear the caterpillar of *Attacus cecropia*, one of the most beautiful species known, and especially remarkable for the changes it

moult, and which had escaped the notice of many entomologists. We agree with M. Blanchard, who, in his "Metamorphoses of Insects," says, *apropos* of experiments in rearing undertaken formally at the museum, that the caterpillar of these species moults five times. However this may be, there is here a first change, which is followed by another and greater one after the second moult. The caterpillars are then wholly of a beautiful orange-yellow, and the tubercles with their verticels of spines are black, as are also the head, the stigmata, and the little scale-like legs. The membranous legs are greenish, with one or two black spots. After the third moult, the caterpillar undergoes a complete change; it is now yellow-green with a sky-blue back, and exhibits two dorsal rows of tubercles, the first four of which are large and spherical, and of a carmine or coral red, with a row of six verticillate black spines, and a seventh spine likewise black at its apex. The base of each of these tubercles is surrounded by large black projecting points, sometimes confluent, and usually of the same number as the spines. The other dorsal tubercles are sub-cylindrical, and of a beautiful dark-yellow, with small black spines at the extremity. The sides show two rows of tubercles of a beautiful turquoise blue. At the fourth moult the caterpillar changes but little, it is more blue, the yellow tubercles are brighter, the stigmata dark, the head and legs of a yellow-green, and the latter have also a black spot at their base. The crown of false legs remains blue. At the fifth moult the red tubercles have become pale, and are of a light garnet, and their spines have become shortened and look like obtuse cones. The black spots situated at their base are much larger. At the instant of moulting, these spots, as

* A. L. Clement, in *La Nature*.