not so great as that of phthisis, a fact that must be comforting to many people who have lost near relatives from cancer.

Summing up the subject as to what is inherited from our parents, I would say that from a physiological point of view there is considerable evidence to show that mental, not less than physical, qualities are transmitted ; that pathologically such a disease as hæmophilia is inherited ; and that where there is a family history of phthisis and cancer there is, especially as regards phthisis, a greater liability to the disease than where a family shows no such record. I believe that the influence of inheritance, however, has been exaggerated. Tuberculous disease is inherited, but only in the same sense as other diseases that are due to microbes. It is in the form of an enfeebled resistance on the part of the tissues. Pulmonary phthisis seems to exhibit a kind of inheritance that is particularly its own, but on scrutiny this is found to be largely due to the domestic character of the malady, which is encouraged by our home life, insanitary dwellings, overcrowding of the poorer working classes, infection, Britain's changeable climate, dusty occupations, and ill-assorted marriages.

MEAT INSPECTION.

By ALFRED HOLBURN, M.R.C.V.S., Chief Veterinary Inspector,
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THE statutory provisions which regulate matters relating to unsound meat in England and Wales outside the Administrative County of London, are contained in the Public Health Act, 1875, Sections 116 to 119, and the Public Health Amendment Act, 1890, Section 28.

Public Health Act, 1875.

Section 116.—Any Medical Officer of Health or Inspector of Nuisances may at all reasonable times inspect and examine any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale, and intended for the food of man, the proof that the same was not exposed or deposited for any such purpose, or was not intended for the food of man, resting with the party charged ; and if any such animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk appears to such Medical Officer or Inspector to be diseased or unsound, or unwholesome, or unfit for the food of man, he may seize and carry away the same himself or by an assistant, in order to have the same dealt with by a Justice.

Section 117.—If it appears to the Justice that any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk so seized is diseased, or unsound, or unwholesome, or unfit for the food of man, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for the sale or used for the food of man ; and the person to whom the same belongs or did belong at the time of exposure for sale, or in whose possession or on whose premises the same was found, shall be liable to a penalty not exceeding twenty pounds for every animal,

carcase, or fish, or piece of meat, flesh or fish, or any poultry or game, or for the parcel of fruit, vegetables, corn, bread, or flour, or for the milk so condemned, or, at the discretion of the Justice, without the infliction of a fine to imprisonment for a term of not more than three months.

The Justice who, under this section, is empowered to convict the offender may be either the Justice who may have ordered the article to be disposed of or destroyed, or any other Justice having Jurisdiction in the place.

Section 118.—Any person who in any manner prevents any Medical Officer of Health or Inspector of Nuisances from entering any premises and inspecting any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk exposed or deposited for the purpose of sale, or of preparation for sale and intended for the food of man, or who obstructs or impedes any such Medical Officer or Inspector or his assistant, when carrying into execution the provisions of this Act, shall be liable to a penalty not exceeding five pounds.

Section 119.—On complaint made on oath by a Medical Officer of Health, or by an Inspector of Nuisances, or other officer of a Local Authority, any Justice may grant a warrant to any such officer to enter any building or part of a building in which such officer has reason for believing that there is kept or concealed any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk which is intended for sale for the food of man, and is diseased, unsound, or unwholesome, or unfit for the food of man; and to search for, seize, and carry away any such animal or other article, in order to have the same dealt with by a Justice under the provisions of this Act.

Any person who obstructs any such officer in the performance of his duty under such warrant shall, in addition to any other punishment to which he may be subject, be liable to a penalty not exceeding twenty pounds.

Public Health Acts Amendment Act, 1900.

Section 28.—(1) Sections 116 to 119 of the Public Health Act 1875 (relating to unsound meat) shall extend and apply to all articles intended for the food of man, sold or exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale within the district of any Local Authority.

(2) A Justice may condemn any such article, and order it to be destroyed or disposed of, as mentioned in Section 117 of the Public Health Act 1875, if satisfied on complaint being made to him that such article is diseased, unsound, unwholesome, or unfit for the food of man, although the same has not been seized as mentioned in Section 116 of the said Act.

Similar powers of seizing and condemning horse flesh intended for human food, unless sold as horse flesh, are provided for in the Sale of Horse Flesh Act 1889. The powers given here are more for the prevention of fraud than for the protection of health, as no mention is

made as to diseased meat. This, however, is covered by the Public Health Acts.

An analysis of these sections will show that :—

- (1) Outside the Medical Officer of Health the Meat Inspector must first of all be appointed an Inspector of Nuisances under and for the purposes of the Public Health Acts by the Local Authority.
- (2) The significance of the terms diseased, unsound, unwholesome, or unfit for the food of man, requires to be understood and determined by the Meat Inspector.
- (3) It is necessary in seizing meat to define whether it is sold, exposed for sale, deposited for sale, or in preparation for sale, and intended for the food of man, and prosecutions have been lost on account of charging a man with one thing when he did another.
- (4) Meat seized is not legally condemned until it is condemned and an order signed for its destruction by a Magistrate. (An exception to this rule is made when the owner of the article seized or condemned gives a certificate or note to the Inspector, that he unconditionally gives it up to him on account of being unfit for human food.)

The Justice condemns the meat simply upon his own view and smell thereof. The condemnation is not conclusive evidence that the food was bad, and the party summoned is at liberty to show that the Justice was wrong in condemning it.

The part played by the Meat Inspector therefore is necessarily one of no small importance. The appeals made to him are :—

- (1) The public require protection from food poisoning, whether bacterial infection, septic intoxication (ptomaine poisoning), or unwholesomeness of diet.
- (2) The justice is dependent upon sound advice before signing the Order for destruction.
- (3) The party charged desires fair play, that is to say, the condemnation of all diseased and unwholesome food, but not the confiscation of sound meat as a matter of course or by way of experiment.

With respect to these principles, we are bound to study meat inspection from a scientific aspect, which is the only way that any guarantee of safety can be attached to the undertaking. From what has been already said it may be gathered that meat inspection forms a part of preventive medicine of which the basis is a knowledge of the natural history of disease. For the investigations as to the causes of disease we are chiefly indebted to our pathologists. They have shown us that certain organisms cause certain diseases, and that animals may serve as the hosts of these organisms; hence, in seeking for the source of disease in the human subject the inquirer is led to study disease in the lower animals. Everyone knows that meat is diseased in consequence of disease in the animal from which it was taken, so that evidences of disease as manifested in the living and dead animal should be understood by the Inspector.

Meat inspection therefore is neither more nor less than applied

pathology. It is not learnt by examining sound animals, but taught in the *post-mortem* room and the laboratory. It is in the examination of diseased animals and carcasses where the skill of a man is required, to determine whether he is dealing with a disease peculiar to animals or communicable to man, and whether or not it will necessitate the condemnation of the whole or part of the carcass. Sometimes it becomes more a question of what can be passed rather than what can be condemned.

I need not argue further the pathological side of my subject, because I feel sure it will be generally admitted that in pathological research lies the foundation of meat inspection. Although it sometimes may be said that the lessons taught by investigators cannot be applied absolutely in daily practice, nevertheless they provide a basis for further inquiry by those employed in public service. I not infrequently come across mysterious lesions of disease, which are invariably made clear by an interview with Professor Delépine, to whom I desire to express my debt of gratitude.

Inspection Prior to Slaughter.

An *ante-mortem* examination is a valuable safeguard against the sale of unwholesome meat, more particularly of animals that are known by the owner to be diseased, *e.g.*, animals taken suddenly ill at their home-steads. We know that there are diseases which, although very important as regards their effect on the fitness of the flesh for food, are not attended by any gross lesions in the carcass. It is also equally important that the slaughtering of animals should be conducted under the direct supervision of the Inspector. In proof of this, we all know that the inspection of a dressed carcass after the butcher has finished his work, and more especially if the organs have been destroyed, is extremely deceptive.

Modes of Slaughter.

The Meat Inspector may be called upon to advise as to the best methods of slaughtering animals, as this has an affect upon the "setting" and keeping of the meat; and furthermore, we are morally bound not to inflict unnecessary pain.

Stunning Followed by Bleeding.—This is the common method of slaughtering cattle in this country. The chief instrument used for the purpose of stunning is the pole-axe; after stunning the animal is bled by making an incision at the lower end of the jugular furrow, so as to divide the large vessels at the entrance of the chest.

Pithing Followed by Bleeding.—Not commonly practised in this country. The butcher stands in front or a little to one side of the animal, flexes its head and thrusts his knife into the space between the occiput and atlas, dividing the cord at its junction with the medulla. The animal immediately drops and is then bled.

Bleeding without Stunning.—The common method for slaughtering sheep, and in some districts young calves and pigs. This is also the Jewish method of slaughtering all their animals.

Electricity.—A method that has been practised in America, but of which I have had no experience. One interesting feature in its

adoption is that it will prove that animals killed by lightning need not be condemned on that account.

Shooting followed by Bleeding.—This is a method which is deserving of more attention. The hard skull of the bull and boar is with difficulty penetrated by the pole-axe, the thick skin over the frontal bone forming a natural buffer, and nothing is more pitiful than to see an animal struck repeatedly before it is rendered unconscious.

Greener's Humane Cattle Killer admirably meets this difficulty. The pistol is simplicity itself. It is charged with a bullet and placed on the middle of the forehead, and by a smart tap with a mallet it is discharged, and its effect is very satisfactory. For the slaughtering of horses I do not think this instrument can be surpassed, and it certainly ought to take the place of the pole-axe at all knacker yards.

After an animal has been stunned, a couple of minutes should be allowed before sticking, to give the blood-vessels time to relax from the systemic shock, in order to favour bleeding. The blood should flow freely, become of a bright scarlet colour on exposure to the air, and should commence to coagulate in about two minutes after being withdrawn, and in about ten to fifteen minutes become a firm, elastic mass capable of being sliced into sections which will retain their shape. About this time also serum will begin to transude out of the clot, which will decrease in size proportionately. Diseases such as anthrax, asphyxia, acute inflammatory affections, etc., alter the normal character of the blood, and interfere with its coagulability.

The amount of blood drawn at the time of sticking varies with the size, age, accuracy of sticking, position of body, etc.; roughly we may say that in the young animal of eighteen months old the quantity of blood will be about two and a half to three gallons, in the three-year-old bullock about four gallons, and in the aged milking cow sometimes four and a half to five gallons. Of course this does not represent the total amount of blood in the body.

Inspection after Slaughter.

If the inspection is made at the time of slaughter, the organs will be examined as they are removed by the butcher in his customary way of dressing, which is much the same in all animals.

To prevent repetition I may mention a simple rule to be observed in the examination of all organs. Their size, shape, colour, and consistency should always be criticised, also their outlines and relationships, after which one may search for pathological changes. A regular inspection is of extreme importance, as it will help one to trace the development and course of most diseases.

The Feet.—These require examining for injuries, septic changes, morbid growths, eruptions of foot-and-mouth disease, etc.

Intestines and Mesenteric Glands.—The bowels are used as a capsule for our black puddings and polonies. Their calibre and peritoneal covering, and the thickness of their walls should be noted.

The mesenteric lymphatic glands in bovine are to be found running along the mesentery near its distal border, about 4 inches from the attachment to the small intestines. Their examination should never be overlooked in conducting a *post-mortem* examination for evidence of tuberculosis, and especially in proving the tuberculin test. The

intestines should always be condemned when their peritoneal covering or lymphatic glands are diseased.

The Stomachs.—The first stomach is commonly called the belly, and after it has been scalded, scraped, and boiled, it constitutes tripe. The third stomach is not used, but the fourth is also converted into tripe. The average weight of the first stomach is from sixteen to twenty pounds. Some lymphatic glands will be found in the fat near the œsophageal entrance, and in the fissure on its anterior surface. The peritoneal surface of the stomachs is frequently affected with tuberculosis, and the mucous membrane of the fourth stomach with worm tubercles, a description of which is given by Professor M'Fadyean in the *Journal of Comparative Pathology*, vol. IX., p. 314.

The Liver.—The normal weight of the ox liver is about ten to twelve pounds. It varies, however, very greatly, even in health. It is a common seat of disease, such as inflammatory changes resulting in fatty degeneration, cirrhosis, parasitic infection (fluke, hydatid cysts), abscesses, tumours (carcinoma, cavernous angiomas, etc.), tuberculosis, and disseminated bacterial necrosis.

In the liver of the rabbit the parasitic infection known as coccidian disease is sometimes met with and mistaken for tubercle. The liver is studded with greyish white nodules varying in size from a pea downwards, with purulent contents which are found on microscopical examination to contain great numbers of the coccidium oviforme. The individual coccidia are egg-shaped bodies, possessing a shell wall with protoplasmic contents. In some seasons an epidemic form of this disease occurs in rabbit warrens.

Disseminated bacterial necrosis¹ has also been mistaken for tubercle. The two diseases, however, are quite easily distinguished. Briefly, in this disease necrosed patches or areas are irregularly distributed through the liver substance, varying in size from a walnut downwards, with a well-defined outline which is not circular; in colour the patch of dead tissue varies from brown yellowish to a dirty grey, and in consistency it resembles putty or unripe cheese, is not purulent, and cannot be easily enucleated from the surrounding tissue. On the surface of the liver the nodules are slightly raised, yet somewhat flattened on their upper aspect, and firm to the touch. The lymphatic glands will be free from tubercular deposit. It may be also said that the liver is usually very much enlarged. The hepatic glands are to be found at the portal fissure.

The Spleen.—Commonly called the melt. Its external surface is frequently affected with tuberculosis, and occasionally the splenic pulp also. This organ is important in the diagnosis of anthrax; particular attention should therefore be paid to its volume and consistency. Its lymphatic glands are usually left attached to the left side of the stomach.

Uterus.—Also termed the calf-bed or lamb-bed as the case may be. Inflammatory diseases, tuberculosis, and septic conditions are chiefly to be looked for.

Heart and Lungs.—These organs are removed from the chest, together with the mediastinal tissue and fat attached. It is important that the following lymphatic glands should be looked for, namely:—

- (1) *Tracheal Glands.*—On the course of the trachea, on its upper surface.

¹ Vide "Journal of Comparative Pathology and Therapeutics, Vol. IV., p. 46.

- (2) *Cardiac Glands*.—At the base of the heart, and must be looked for before the organ is severed from the lungs.
- (3) *Bronchial Glands*.—At the bifurcation of the trachea into the two bronchii. The right gland is sometimes torn away, but the left is always to be found by cutting down on the left bronchial tube.
- (4) *Mediastinal Glands*.—This group of glands will be found in the form of a chain running in the mediastinal tissue between the right and left lungs on the œsophagus. They are of large size.

The lungs must not be stripped of their fat until these four groups of glands have been examined, otherwise they will be removed. Their examination is necessary in all inflammatory and blood diseases, and in tuberculosis they should never be overlooked. They are frequently found affected when this disease is not apparent in the lung tissue—an item to be remembered in making *post-mortem* examinations after the tuberculin test. All other diseases of the lungs and heart are of course to be looked for.

The Mammary Glands, or Udder.—The mammary glands are two in number, and are placed side by side on the middle line of the abdominal wall in front of the pubes. They form here a single mass with a furrow between them; each gland consists of a fore and hind quarter. The term “udder” is used to include both glands.

The udder of the cow when boiled constitutes an article of diet in the tripe shops. The examination thereof is important. Each quarter should be criticised in respect of volume and consistence, and an incision should be made from the ampulla right through the whole gland, dividing it into halves. The milk ducts and gland tissue will then be well exposed, and its peripheral borders and ducts should be carefully examined.

The Lymphatic Glands of the Udder.—Situated at the supra-posterior border of each gland, near the entrance of the blood vessels—that is to say, above the attachment of the hind quarters. Their examination is extremely important in all inflammatory diseases, tuberculosis, and septic affections of the udder.

Pharyngeal Glands.—Situated at each side of the pharynx, and related to the inner surface of the great cornu of the hyoid bone near its attachment to the skull. They are easily got at by placing the head on a table, face downwards, with its base towards you, the examiner raising the cut end of the trachea with the left hand, feeling for the hyoid bone, and make an incision. They are frequently seen without any dissection when the tongue is removed.

Submaxillary Glands.—Found at the angle of the lower jaw, at the inner side of the attachment of the sterno-maxillaris.

Parotid Gland.—At the anterior border of the parotid salivary gland, resting on the masseter muscle.

Sub-occipital Glands.—At the base of the occipital bone, near the condyles.

Mammary or Superficial Inguinal.—These have been already alluded to. In the bullock they are to be found at the base of a mass of fat known as the “cod” in the inguinal region, and are readily brought into view by making a bold incision in this fat from the inner surface and cutting down upon the abdominal tunic. In the pig these glands

are to be found in the subcutaneous fat above and a little posterior to the last teat in the inguinal region.

Deep Inguinal Glands.—This large group of glands is to be found at the pelvic inlet, in the distal edge of the loin suet and on the course of the external iliac artery, about midway between its departure from the aorta and its entrance into the thigh muscles.

Iliac Glands (External and Internal).—These are related to the arteries of the same name at their origin about the last lumbar vertebra.

Sacral Glands.—Situated at the floor of the sacrum, between the two internal iliac vessels.

Lumbar Glands.—These may be described as a superficial and deep set. The superficial chain, which perhaps belong to the large bowels or their mesentery, are to be found in the fat in front of the large vessels in this region. The deeper set are situated close on to the lumbar vertebræ.

Another group of glands is to be found in the fat of the loin, resting on the muscles of the flank a few inches anterior to the deep inguinal, and at the point where the circumflex iliac artery divides into its anterior and posterior branches.

Renal Glands.—At the origin of the renal artery, about the second lumbar vertebra.

Coeliac Glands.—Between the pillars of the diaphragm, at the origin of the coeliac axis.

Popliteal Glands.—These glands are to be found in the popliteal space, and are readily got at by cutting through the thigh muscles immediately above and posterior to the stiple joint (femoro-patellar articulation), on the track of the femoro-popliteal artery.

Precrural Glands.—Of large size, and found in the groin fascia. The landmarks for its section are the superior border of the panniculus carnosus, a few inches from its posterior angle at the groin, and the fascia intervening between this point and the anterior muscles of the thigh.

Sub-dorsal Glands.—These will be found on each side of the aorta, from about the fifth to the last dorsal vertebræ. Most of these glands are frequently removed in dressing, but two or three will be generally found from the tenth to the thirteenth vertebræ.

Intercostal Glands.—Situated between the ribs at their junction with the vertebræ. In health they are very small, probably not larger than a pea. In disease, however, they may be the size of a hazel nut.

Supra-sternal Glands.—Situated between the costal cartillages of the first six ribs, under the triangularis sterni, on the course of the internal thoracic artery. In front of the thoracic side of the insertion of the diaphragm, across the ensiform cartilage, will be found a gland superficially placed.

Prefectoral Glands.—This large group of glands will be found at the entrance of the chest, on the surface of the first rib, if not removed by the butcher. A deeper gland, however, will always be found in the fat immediately anterior to the first rib, and beneath the scalenus muscle, resting upon the posterior deep pectoral.

Brachial Glands.—These glands cannot be conveniently examined unless the fore quarter is divided longitudinally. They can, however, be exposed by removing a portion of the second rib, when they will

be found in the fat beneath, resting on the *teres major* near its insertion into the humerus.

Prescapular Glands.—Found in the mass of fat immediately anterior to the shoulder joint, under the *mastoido-humeralis* muscle.

An examination of the lymphatic glands is extremely important in tracing the origin, course, and extent of disease ; consequently their normal size, consistency, and colour should always be taken into account. There are very few diseases or conditions that render the carcase of any animal unfit for human food but what produce some abnormal changes in these glands. This is evident when we remember that the lymph that circulates through these glands is simply diluted blood plasma, which is constantly exuding from the blood capillaries into the interstices of the tissues of the body, from which the lymph vessels arise. Other matters than those of normal blood plasma may find their way into the lymph stream, such as the waste products resulting from the metabolism of tissue, a great part of which is purely excrementitious. It may also be mentioned that changes in the character of lymph correspond very closely with changes in the character of the blood.

The lymph glands have therefore a defensive as well as an elaboratory function to perform. And when overcharged with effete matters, as in all acute inflammatory and blood diseases, they become swollen, congested, or inflamed, or even broken up to the consistency of a rotten pear.

Changes in the lymphatic glands may be local or general according to the extent of disease in the system producing these changes, as are observed in tubercle, udder diseases, injuries, etc.

The Examination of the Carcase.

It not infrequently happens that the Meat Inspector has got to pronounce as to the fitness or otherwise of meat for human consumption simply upon the examination of the carcase, which is a very unsatisfactory situation. The consistency, colour, and odour of the flesh, together with the condition of the lymphatic glands, will in most cases, however, declare the existence of disease.

Before making a section, the following scheme might be observed :—

- I. *Name animal.* II. *Sex.* III. *Age.* IV. *Nutrition.*
- V. *Surface abnormalities, e.g. post-mortem* lividity, hypostatic congestion, œdema, subcutaneous hæmorrhages, injuries, etc.
- VI. *Condition of pleura and peritoneum.*
- VII. *Indications of imperfect bleeding*, and the trickling of dark semi-coagulated blood, as in anthrax.
- VIII. *Fat* : quantity, consistency, colour, etc.
- IX. *Kidneys.* It is generally convenient to examine these now—in the old cow they are frequently found diseased.
- X. *Rigor Mortis.* The quartering of a carcase, beyond dividing the vertebral column, should be deferred until it is set or *rigor mortis* is complete, more especially so if there is any chance of a portion of the carcase being passed.

Setting.—*Rigor-mortis* or *post-mortem* rigidity is a contraction of

the muscles producing a general stiffening of the body (carcase), and is due to the coagulation of myosin.

The process is said to be modified by :—

- (1) State of animal before slaughter, *e.g.*, excited or calm.
- (2) Presence or absence of disease.
- (3) Temperature of surrounding atmosphere.
- (4) Humidity of surrounding atmosphere.
- (5) Method of slaughter.

In order to have sweet bright meat every facility should be given to favour the setting of carcasses, and in obtaining this object it is necessary to consider the following as affecting decomposition :—

- (a) The purity of atmosphere.
- (b) The principles of evaporation.
- (c) The reduction of temperature.

Atmosphere.—The necessity of a pure atmosphere is self evident.

Evaporation.—The slow production of vapour from a moist surface.

This is necessary in order to dry, make marketable, and secure the keeping of, meat.

The rapidity of this evaporation is influenced by :—

- (1) Temperature.
- (2) The quantity of moisture in the surrounding atmosphere.
- (3) The renewal of the atmosphere.
- (4) The extent of surface of evaporation.

Increase of temperature accelerates the evaporation by increasing the elastic force of vapour. Secondly, no evaporation could take place in an atmosphere already saturated with vapour of the same liquid. Thirdly, as to the renewal of atmosphere, it is evident that if the air surrounding a liquid is not renewed it soon becomes saturated and evaporation ceases.

Reduction of Temperature.—This is effected by the conduction and radiation of heat.

By conduction is meant that heat is transmitted into a body by its gradual communication from one material particle to another until the temperature of the whole mass is raised, and by the same process the body becomes cold again.

Meat is a bad conductor of heat, that is to say roughly, it admits heat with difficulty and gives it up with difficulty.

Radiation, or the emission of heat from a body, plays an important part in the reduction of temperature or the cooling of a carcase, at anyrate until an equilibrium is reached with the temperature of surrounding bodies. It is necessary, however, to watch that this surrounding temperature is favourable to the keeping of the meat. The practical purposes achieved by these considerations go to show that a natural phenomenon must not be interfered with, but rather that great care should be taken to assist its completion, and pursued to a point that will improve and help the economy of the meat trade, which is no small medium of exchange in this country. By way of further illustration, I may mention that in the heat of summer we occasionally find that decomposition is established in the centre of large hindquarters of beef about the second day after being dressed. The explanation lies in the fault of cooling. Frozen hindquarters of beef are sometimes found bad in their interior when taken out of the cold chamber. The fact can be explained in this way. The meat

has been put into the freezing chamber in a warm state, evaporation and radiation from the surface has been checked, and a capsule of ice being produced in this way a battle is fought between the imprisoned heat inside and the frost. The result is that before the heat is overcome fermentation has been established.

The necessity of a frequent change of air is also illustrated by the adoption of those refrigerators or ice-boxes used by butchers, confectioners, restaurants, hotelkeepers, etc.

Warm meat put into these closed-up boxes, although charged with ice, is frequently found bad in the interior, owing to the cooling phenomena being delayed.

It may also be interesting to remark with regard to frozen or chilled meat that, after exposure, its surface soon becomes moist or wet, this being more marked in a humid atmosphere. This is due to the fact that the layer of air immediately in contact with the chilled body is cooled below its point of saturation, and therefore deposits a portion of the vapour it contains, just as when a bottle of cold water is brought into a warm room it becomes covered with moisture owing to the condensation of aqueous vapour upon it.

Sectioning the Carcase in the Case of Cattle.

This should be done as far as possible in a customary manner, as undue mutilation is undesirable should any portion of the carcase be passed. Different districts have slightly different methods, and the butcher can generally be allowed to divide in his own way, so long as it permits of the purposes of inspection.

In Manchester the fore and hind quarters are separated by commencing at the junction of the first and second lumbar vertebrae or the sixth joint from the sacrum. The muscular area exposed is not large, and only occasionally will it suffice for the investigator. The hind quarter should next be cut by making a complete section through the muscles of the thigh, commencing about an inch or so from the ischio-pubic symphysis, sawing through the head of the thigh bone (femur), after which the knife is directed in a longitudinal manner through the muscles of the flank. This is a customary section in the trade, and it is the most satisfactory for the examiner, inasmuch as it exposes to view a large muscular area, and one which is frequently the seat of abnormalities.

The fore quarter should be divided by a longitudinal incision down through the shoulder joint, in order to expose the thick muscles and the joint cavity. After this section it is easy to expose the brachial and prescapular lymphatic glands.

The purpose for which these sections are made is to ascertain the colour, odour, and consistency of the flesh, evidences of medication and putrefaction, and any other morbid change, such as parturient injuries, inflammatory conditions, œdema, hæmorrhages, purpura eruptions, transudations, emphysema, parasites, and whether death was due to natural causes or slaughter.

With reference to inflammatory fluids in the flesh, I may mention that the increased transudation of liquids into the tissues is a feature of all inflammations. This infiltrated fluid causes the muscles to have a gummy consistency, in consequence of the albumen it contains, and is thus easily distinguished from ordinary dropsical fluids.

The muscles, therefore, of an animal that has suffered from any acute inflammation will be found dark, owing to imperfect oxidation, and their normal texture destroyed by the infiltration of an albuminous fluid, which imparts a gummy sensation to the fingers. The lymphatic glands will also be congested.

Chemical tests and the frequent use of the microscope, it must be remembered, are valuable accessories in solving the problems of disease.

METASTATIC LESIONS IN DISCOMYCOSIS.

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THE discomyces, or botryomyces, belongs to the group of pyogenic cocci, and after the streptococcus of strangles it is probably the most frequent cause of suppuration in the horse. In at least all the chronic lesions of which it is the cause the pus contains granules which are large enough to be visible to the naked eye, and which have a close resemblance to the colonies of the actinomyces. When these granules are magnified they are found to be irregularly spherical, with a somewhat lumpy or botryoidal surface, and an appearance of being compounded of a number of smaller rounded masses. Appropriate staining, especially by the method of Gram, generally shows that these smaller masses are composed of irregular groups of cocci imbedded in a sort of matrix substance. Sometimes it is difficult or impossible to make out the presence of any such elements in the granules. Some have thought that these granules represent a phase in the life-history of the organism equivalent to sporulation, but there is no satisfactory evidence of the correctness of that view, and it is more probable that their formation is more akin to the processes which have been termed "involution" in the case of some of the better known bacteria. They do not appear to be endowed by any powers of resistance beyond those possessed by the free independent cocci, and in some cases both inoculation and cultural experiments may indicate that all the coccus elements in the granules are dead.

Although the organism received its names from the appearance of these granules, the pus which contains them, when properly stained, always shows other forms, viz., diplococci or ordinary groups of staphylococci, not distinguishable from similar forms of the staphylococcus pyogenes aureus. Furthermore, when potato, gelatin, agar, or bouillon, is inoculated with pus from a case of scirrhus cord or other discomyces lesion, the resulting growth does not differ in any important way from that which is obtained in these media after inoculation with human pus containing the staphylococcus aureus. Liquefaction of the gelatin is perhaps a little less rapid than with the last-named organism, and surface cultures of the discomyces on agar are perhaps as a rule of a fainter yellow colour than those of the staphylococcus aureus on the same medium. It has also appeared to me that cultures of the discomyces on agar lose their vitality from desiccation sooner than those of the staphylococcus aureus. It cannot be said, however, that any of these differences, or the combination of them, would warrant one in pronouncing the discomyces and the