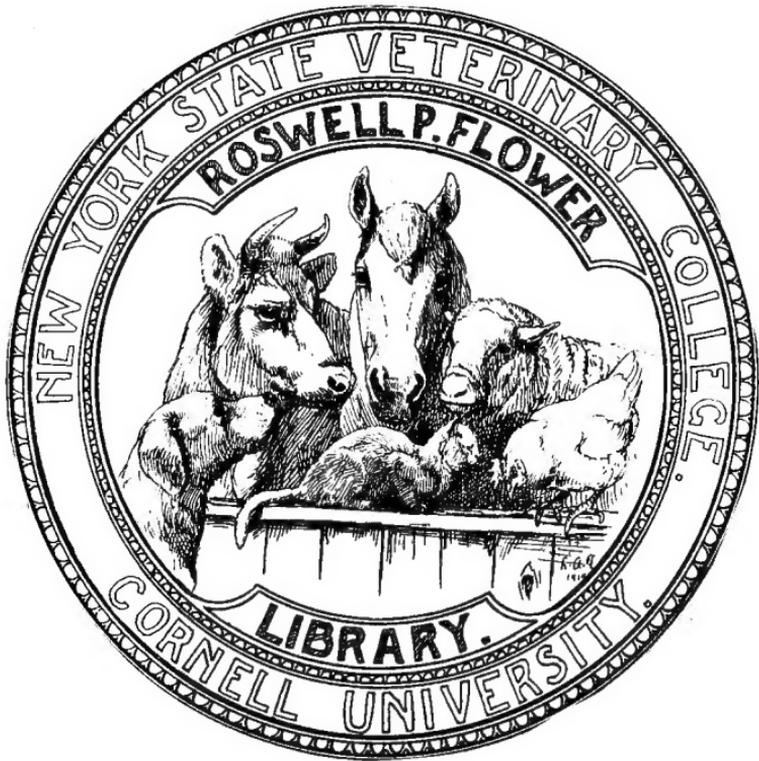


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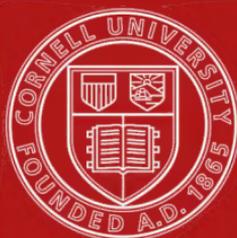
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RABBIT AND CAT DISEASES

By

CHARLES GREATLEY SAUNDERS,
V. S., B. V. Sc., D. S. O.,

Major in Canadian Army Veterinary Corps; Former Professor Canine and Feline Medicine Ontario Veterinary College; Author of "Canine Medicine, and Surgery," "Equine Operative Surgery;" Former Editor Canine Department American Journal of Veterinary Medicine, Etc.

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Introduction.

Domesticated rabbits, and this includes Belgian hares, are not, as a rule, liable to many diseases if the elementary principles of hygiene are practiced, but great losses occur if these be neglected and what should be a profitable industry becomes a loss to the investor. In spite of their paucity in numbers the ailments of rabbits kept in confinement are usually of a serious nature, often causing the loss of the entire stock.

As the majority of diseases from which rabbits suffer are preventable or at least controllable, it is of the utmost importance that symptoms of disease be recognized as soon as they become apparent, and that the correct methods of dealing with the outbreak are taken. It is suggested that, as the rabbit industry is assuming important proportions, not only in the production of fancy lines but for the purpose of food production, veterinarians devote some of their energies to combating the diseases that are bound to increase in prevalence in proportion to the numbers of rabbits raised. It is hoped that the information contained in this little work will not only assist the veterinarian in dealing with outbreaks of disease among rabbits, but stimulate further research

work, and so encourage the development of an important industry. Many would-be raisers of rabbits or Belgian hares are deterred from embarking on the undertaking owing to the risk of losing their stock from ailments which to them are mysterious. Others already in the business would be only too glad to obtain advice and pay for it if the veterinarian was in a position to offer a solution to the problem of preventing or controlling the ravages of disease. Unfortunately the diseases of rabbits are but very lightly touched upon in veterinary schools and to cover his ignorance the veterinarian too often pretends that it is beneath his dignity to treat a rabbit. From both the economic and professional aspect this is a mistake. The value of the rabbit as food is considerable, and from a professional point of view a veterinarian should be competent and eager to combat disease irrespective of the animal which it attacks.

It was also thought appropriate to include in the work a consideration of diseases of the cat, Part II being devoted to some special clinical and therapeutic notes on this subject. Only comparatively recently has the cat come to be regarded as a clinical entity, having formerly been treated along the lines of canine medication. However, clinical experience with the peculiar psychology of the feline animal and its idiosyncrasies in regard to certain

drugs led veterinarians who specialized in this branch of veterinary medicine to conclude that what is applicable to the dog is not necessarily suitable for the cat. It is hoped that the discussion of the subject contained in this volume may be of some help to veterinarians who are called upon to treat feline patients.

C. G. SAUNDERS.

London, November, 1919.

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PART I
Diseases of Rabbits

CHAPTER I

CONSIDERATION OF THE RABBIT IN HEALTH

Appearance In Health

The healthy rabbit has a bright, vivacious manner, bright eye and a smooth coat. The natural apertures of the body should be free of catarrhal or other discharge and the skin free from scurfiness or eruptions. The feces should be hard and firm and rounded into pellets. Signs of indisposition are anorexia, lassitude, and an inclination to separate from its companions. The normal temperature of the rabbit is 100.85° F. (38.25° C.) The character and rate of the pulse vary so greatly that for purposes of diagnosis no reliance can be placed on them; the same applies to the rate of respiration, the mere excitement of handling and examination being sufficient in itself to cause such changes in rate and character as to be misleading.

Method of Examination

In making an examination of a rabbit either for a would-be purchaser or for diagnostic purposes, it is as well to adopt a regular routine and go over the animal carefully and minutely. The popular method of lifting a rabbit by the ears is an ordeal that no rabbit

should be expected to undergo; in heavy animals it is gross cruelty and should never be practiced; the correct method is to grasp the rabbit by the loose skin over the shoulders and with heavy animals both hands should be used, one grasping the skin as above mentioned, the other placed under the hindquarters. A vicious rabbit can inflict a nasty injury with its teeth and also use its claws to some advantage so that a certain amount of circumspection is advisable in handling such cases.

Notice should be taken as to whether or not there are symptoms of nasal catarrh, conjunctivitis, discharge from the vulva, or penis. The ears should be inspected for canker. The skin should be examined by turning the hair back, for eruptions, mange, lice and fleas.

The teeth should be examined for irregularities, etc. The age may be determined approximately by the following points. In the young animal the teeth are bluish white, in aged animals the teeth become elongated and yellow. The toe nails in animals under one year do not project beyond the fur; at eighteen months they project beyond the fur but are nearly straight. After two years old the nails are longer and decidedly curved and the length and curvature increase with age. A young specimen can also be detected by feeling with the nail whether the epiphysis of one of the

long bones has become ossified or is still connected with the shaft by cartilage. The above are only very rough indications as to age but as far as they go are useful and reliable.

Feeding

There are many popular superstitions in the matter of the feeding of rabbits, but as in the case of all animals success depends not so much on the precise nature of the food stuffs as upon the correct ratio of digestible albuminoids, fats and carbohydrates, contained in them. The correct proportion for young rabbits and nursing does is proteins 1, carbohydrates 4 to 5. Rabbits fed on a diet deficient in proteins, acquire a voracious appetite but at the same time fall off in condition or fail to develop, becoming weakly and stunted. The fault most generally committed in feeding rabbits is to feed a ration with a deficiency of proteins with the results enumerated above. On the other hand a ration with protein in excess of the requirements of the individual is an extravagant one and seriously reduces the profits of the enterprise. The quantity of food consumed by the average rabbit may be estimated at two ounces daily per pound weight but it must be understood that this estimate applies only to the correctly balanced ration. In addition it should be remembered that the younger the rabbit the higher must be the proportion of proteins in

its diet, that nursing does require more liberal ration and that rabbits require one third more food in winter than in summer.

Suitable Rations

For adult rabbits of medium size give: Hay three ounces, roots eight ounces, and one to two ounces (dry) of a mixture composed of equal parts of bran, soy bean meal, or decorticated cotton seed meal, or bean meal or pea meal, or linseed meal or maize gluten, mixed together with sufficient water to form a crumbly mash. The quality of the hay must be taken into consideration; clover and alfalfa hay contain a greater proportion of digestible albuminoids than ordinary meadow hay.

Green Food

In summer an adult rabbit of medium size will consume from two pounds to four pounds of fresh cut meadow grass a day and during the mid-summer months will require little else, but after August the grass should be supplemented until the full ration is reached in October. A mixture of any of the common garden vegetables may be given with advantage but potato haulms (tops) and the haulms (vines) of runner beans must be avoided. Rabbits should be fed twice daily and the food should be varied, that is the meal should not consist of, say, cabbage leaves only, but of mixed vegetable leaves, etc.

Water

There is a persistent idea that rabbits should not have access to water; this is a mistake, and a pan of water should always be kept in the hutch. It should be needless to point out that only pure water should be used as parasitisms and contagious diseases may be spread by contaminated water.

Hygiene

To keep rabbits healthy, their hutches must be kept scrupulously clean, remove soiled litter daily and clean the hutches themselves, thoroughly at least three times a week. If this is done much is accomplished in preventing the infection of the inmates with the ova of the *Eimeria cuniculi*. Rabbits should be kept dry, and should not be exposed to draughts. They should receive a plentiful supply of fresh air, from over head ventilation. They should be protected from strong winds and from the full glare of the summer sun. Rats and mice should be excluded from the rabbitry as they are potential carriers of disease.

The purchase of old or second hand hutches is undesirable, because of the danger of introducing disease into the rabbitry, and in any case these if they are bought should be thoroughly disinfected before use.

The ova of the *Eimeria cuniculi* are extremely resistant to ordinary disinfectants and the

hutches should first of all be scrubbed out with boiling water and strong lye, then rinsed with boiling water and finally dried with a gasoline blow torch. Particular care should be taken to scrape out all cracks and crannies and to ensure that the boiling water penetrates to all these recesses.

Rabbits showing the slightest sign of illness should not be purchased and all additions to the rabbitry should be quarantined for at least fifteen days.

Contagion may be introduced by bucks used for service and it is advisable to make sure that the buck is free from any form of disease or parasitic affection, and also that the rabbitry from which he comes or to which the doe is sent, likewise has a clean bill of health.

It should be noted that a very large percentage of adult rabbits are carriers of coccidiosis, even if showing no symptoms of disease and on that account it is undesirable that young and adult rabbits inhabit the same hutch or run and for the same reason that the hutches be kept free of accumulations of feces.

In shipping rabbits for show or sale, care should be taken to provide a box with sufficient room and ventilation and to make sure that points of nails or tacks with which the labels are attached, do not project on the inside, as this is frequently a source of injury. The bot-

tom of the box should be covered with sawdust and a good layer of hay laid down on the top of it. In addition food should be provided in the shape of a crust of bread, a carrot or two or slice of a root; food such as lettuce or cabbage leaves that are likely to ferment should not be used.

Rabbits suffer greatly from fatigue after a journey or a show and require several days' rest to recover. Upon the completion of a journey or return from a show the rabbit should be given a drink of water, and a feed of green stuff and then allowed to rest. The same precautions as to quarantine should be taken with rabbits returning from a show as with fresh arrivals, as shows are great disseminators of disease.

Lastly, it should always be remembered that in dealing with rabbits prophylaxis is more productive of results than treatment.

CHAPTER II.

DISEASES OF THE DIGESTIVE TRACT

In well managed rabbitries diseases of the organs of digestion, apart from parasitic and bacterial infections, are the exception rather than the rule, and are seldom fatal, producing only a transitory illness that with appropriate treatment and the removal of the cause, ends with rapid recovery. Individuals only, are as a rule, affected and the prevalence of a number of cases showing severe symptoms and a large mortality, indicate that one has to deal with something far more serious than a simple digestive disorder.

The only points of special interest in the digestive apparatus of the rabbit is the possession of a well developed vermiform appendix, and that after death the stomach carries on its digestive functions to the extent of digesting its own walls. This latter point should be taken into consideration when making post mortem examinations or an erroneous diagnosis may be made. The practical application of this rather curious phenomenon, is that rabbits should be gutted immediately when killed for market or for the table.

Pytalism

Excessive flow of saliva is a symptom of defective or irregular teeth, stomatitis, either

produced by irritant medicines and foods, or in connection with simple digestive troubles. It is a symptom also of the more fatal diseases caused by parasitical and bacterial infections.

Treatment.—This depends upon the cause; irregularities of the teeth should be corrected by smoothing off the projecting points with a file or the extraction of projecting ones. It is not advisable to cut off projecting teeth as the pulp cavity is thereby opened and severe pain occasioned and later on the tooth decays. Medicines should be properly diluted and food of an irritating nature withheld, mild mouth washes may consist of dilute potassium permanganate or potassium chlorate solutions, or hydrogen peroxide 1 to 5 or alum or tincture of myrrh.

Indigestion

Indigestion is usually caused by inappropriate diet, such as a too plentiful supply of wet green stuff, want of variety in the ration, debility caused by unhealthy surroundings, cold and wet.

The symptoms are dullness, restlessness, colicky pains, tympanites and often diarrhea. If occurring in young animals, a microscopic examination of the feces should be made as it is necessary to differentiate simple digestive disturbance due to errors of diet from coccidiosis. The absence of more urgent and multiple

symptoms will differentiate this condition from the graver bacterial infections.

Treatment.—The patient should be isolated and placed in a sheltered and comfortable hutch. Green food should be withheld and a concentrated dry diet substituted. If tympany is the predominant symptom it should be relieved by a dose of *Ol. terebinthinae* min. v in *Ol. ricini*, drams i; this may be repeated in a couple of hours if relief is not obtained. If diarrhea is present, the turpentine should be omitted and *Tr. opii* and *Tr. catechu* as min. v, substituted; if persistent Dover's powder grs. v, twice daily, may be given and sulphocarbolates of calcium, zinc and sodium dissolved in the drinking water or dissolved in the water with which the mash is mixed. One one-thousandth grain doses of copper sulphate will often correct a diarrhea in young rabbits. It needs to be frequently repeated.

Constipation

Constipation is of rare occurrence in the rabbit and is invariably the result of dietetic errors, such as a too highly concentrated ration, lack of sufficient green food, deprivation of water, lack of moisture in the food, etc.

Treatment: The diet must be corrected and a supply of green stuff given, such as grass, clover, vetches, chicory, kale, cabbage leaves. A laxative of *Tr. Rhei* compound

min. x should be given daily until the bowels resume their normal functions.

Hemorrhagic Gastro-Enteritis (see Rabbit Septicemia)
Diarrhea Caused by Parasites; (see Parasites and Coccidiosis.)

Parasites of the Digestive Tract

The parasites of the rabbit's digestive tract are not particularly numerous and with the exception of the coccidia, are not productive of great systemic disturbances unless the infestation is very heavy. On the other hand in heavy infestations the death rate is high and the recognition of the situation is necessary in order to prevent as far as possible further loss.

Coccidial invasions are so prevalent and of such importance that a special chapter is devoted to the consideration of this disease.

The strongyles are next in importance, and often cause great mortality, especially amongst rabbits raised on the Morant system. Wild rabbits are also victims to strongyle infestations. Overstocking of warrens, feeding food grown on land fertilized with rabbit manure and contaminated water are the etiological factors.

STRONGYLOSIS

The most important strongyle of the rabbit is the *S. strigosus* which can be recovered from the intestinal contents by diluting them with salt solution, breaking up the lumps so as to

produce a liquid of soup-like consistency, and fishing for the worms with a needle set in a penholder such as is used for teasing histological specimens. The strongyle is of small dimensions, filiform and reddish pink in color. Heavy infestation causes wasting, diarrhea, sometimes epileptiform convulsions and death from anemia and exhaustion.

Treatment: As in all strongyloses, treatment is unsatisfactory but should be attempted. Ferri carbonatis saccharata should be given in five grain doses every morning and a generous diet and free access to salt should be allowed. As regards prevention, all droppings must be burned and food grown on ground manured with rabbit manure, discarded or cooked before use. Rabbits should be kept off infected ground until it has received a liberal dressing of salt, 1000 pounds to the acre.

The *Trichocephalus unguiculus* is also found in the cecum and large intestine but appears to be innocuous.

The *Oxyuris ambigua* is found in the rectum, and is sometimes seen hanging to the fur in the anal region. This parasite apparently causes no ailment and is unimportant.

TAPE WORMS

Cestodes are not often met with in the domestic rabbit; usually the *Cittotaenia ctenoides* is the one most commonly found. Heavy in-

festation causes unthriftiness, emaciation, and general debility, but the appetite remains normal or may be increased.

Treatment: This consists in starving the rabbit over night and giving a teniacide first thing in the morning. Ethereal extract of Felix mas five to ten minims in two drams of glycerin and followed in one hour by a saline purge such as magnesium sulphate grains xi in one ounce of water is effectual.

The rabbit is also the intermediate host for the larval form of two tapeworms of the dog, viz., the *Taenia serialis* and the *Taenia serrata*. The cystic form of *Taenia serrata*, the *Cysticercus pistiformis* establishes itself between the layers of the peritoneum; it may also be found in the peritoneal cavity and occasionally attached to the surface of the liver. It is without clinical interest.

The *Coenurus serialis*, the cystic form of the *T. serialis* is found in the subcutaneous connective tissues, between the muscles, and sometimes in the eye. Unless in great numbers and in some unfavorable situation the host suffers no inconvenience, but as the presence of the bladders depreciate the market value of the animal, the bladders should be removed when accessible. This is effected by a very simple surgical operation, which is carried out as follows:

It is desirable to extract the bladder without rupturing it as sometimes the rupture of the bladder complicates its removal. The skin over the bladder, after clipping away the fur, is painted with tincture of iodine, a small fold picked up with dressing forceps and the fold snipped transversely with the points of a pair of scissors; the bladder is now grasped with the forceps and gently extracted, and to prevent the possibility of ingestion by a dog, burnt. Dogs on the same premises with rabbits should receive treatment for tapeworms and should not be fed with carcasses of rabbits infested with the cystic forms. Stray dogs should be kept off the premises as much as possible.

CHAPTER III

COCCIDIOSIS

This is by far the most important disease of the rabbit, both on account of its prevalence and on account of the variety of the lesions produced. As stated before, adult rabbits are often the carriers of coccidia without showing any symptoms themselves. Young rabbits are generally the victims of their inroads and the mortality is usually very high. In order to appreciate the full significance of the coccidia, a working knowledge of the life history is essential, and for that reason a short description is given.

The coccidia belong to the phylum Protozoa, class Sporozoa or telosporidia, order Coccididae. The life cycle is completed by asexual and sexual generations. There are four genera, members of which attack mammals, invertebrates and fish. The genus which we have to consider here is the *Eimeria*, members of which chiefly attack vertebrates, man included.

Life Cycle of the *Eimeria Cuniculi*

The adult coccidium is ovoid in form and consists of a chitinous shell which is smooth and fairly thick and which at its narrowest pole shows a small indentation, the micropyle. The micropyle communicates with the granular protoplasm within the shell and is the means of

ingress for the male element in fertilization. The extreme length is 40 to 49 microns, width 22 to 28 microns. In unfertilized adults the protoplasm fills the shell but when fertilization has taken place the protoplasm collects into a spherical mass in the center of the shell and develops a central nucleus. This constitutes an oocyst which is the last stage of development in the liver. The oocysts pass into the intestine from the liver and are evacuated with the feces. Under favorable conditions of warmth and moisture, the protoplasm of the oocyst splits up into two and then four sporoblasts. Each sporoblast then becomes elongated in form and becomes a sporocyst, which subsequently undergoes division to form two sporozoites, the remaining unused small mass of protoplasm being termed the residual body. There are thus developed eight spores or sporozoites, or falciform bodies as they are sometimes termed, from one fertilized adult. The whole process takes about a week, and this knowledge is of practical importance as if the hutches are cleaned out twice weekly, no sporozoites can be ingested by other individuals and the disease spread. The development of the fertilized oocyst must attain the sporocyst and sporozoite stage outside the body as if ingested before that has taken place, development ceases. If the sporocyst containing the sporo-

zoites be taken into the body of a rabbit with the food, the envelope is dissolved by the pancreatic juice and the sporozoites set free. The sporozoites are actively motile and penetrate the epithelial cells of the intestine or bile ducts, entering the protoplasm of the cell and pushing its nucleus to one side and assuming a spherical shape. This sphere which develops at the expense of the invaded cell is now called a schizont; it has no enveloping membrane but contains a large alveolus or vacuole. By a process of asexual multiplication, the schizont produces from ten to fifteen nucleated and fal-ciform bodies, which again subdivide into daughter cells, which arrange themselves around the periphery of the mother cell, presenting the appearance of the quarters of an orange. The schizont then splits up, and the contents which are now termed merozoites are set free. The merozoites are motile and wander free in the intestine; some perish but others invade fresh cells and repeat the process of schizont formation by which other merozoites are produced. It is this repeated invasion of cells and rapid multiplication of individuals that account for the rapid development of the disease and the lesions produced.

The above process is termed schizogony. There appears to be a limit to the duration of schizogony, and when this is reached the mero-

zoites after invading the cells become transformed into male and female elements, respectively termed microgametes and macrogametes. The macrogamete develops slowly from the merozoite. Its nucleus contains a karyosome, which later becomes expelled. The granules of its protoplasm become ranged around the periphery and form an enveloping membrane with a micropyle. At this stage it is ovoid in form and escapes from the cell and lies on the surface of the epithelium and is ready for fertilization.

The microgamete is produced in a slightly different manner. The merozoite loses its enveloping membrane and granular protoplasm. Its nucleus contains a large karyosome. The nucleus by subdivision becomes split up into a number of daughter nuclei which become flattened, elongated and comma-shaped and finally develop two flagella. The microgametes, which bear a great resemblance to the spermatozoa of the higher animals, become detached from the parent merozoite, which in this stage is called a microgametocyte, and become free moving organisms. Chemotaxic influence of the macrogamete attracts a microgamete which enters the micropyle of the macrogamete and fertilizes it. The micropyle closes immediately the microgamete has entered so that only one male element is concerned in fertilization. The

fertilized macrogamete is now termed an oocyst, which on being passed out of the body repeats the cycle which has just been described.

Modes of Infection

From the above description of the rapid development of the organism, one can understand that once introduced into a rabbitry the disease may spread with extreme rapidity. As before stated, it is introduced into a rabbitry by infected rabbits, hutches, food, travelling baskets and crates, etc. The disease attacks rabbits of all ages, but young rabbits from the ages of four to eight weeks old appear to be the most susceptible. It may also attack the young before weaning. Warm weather and a humid atmosphere are most favorable for its spread, and it is not so prevalent in very hot and dry, or during dry and frosty weather. Damp and wet living quarters and runs are most favorable to its rapid spread, partly because such conditions are favorable to the development of the organism and partly owing to the lowered resistance of the animals that such conditions produce.

Symptomatology

The symptoms depend greatly on the intensity of the invasion and also whether the liver or the intestines are the most heavily infested. In any case the symptoms so merge themselves into one another that it is not always possible

to determine the different degrees of infestation as described in the literature on the subject, but for convenience of description, it is advisable to differentiate hepatic, intestinal and nasal coccidiosis.

Hepatic Coccidiosis

In light infestations symptoms sometimes do not develop and the condition is found only post mortem. When the infestation is heavy, however, the animal becomes dull, shows lassitude, appetite poor, fur dull, rough and easily pulled out, gradually becomes emaciated, the abdomen ascitic (pot belly), staggering gait, often convulsions and death after a few weeks. There is always a profuse diarrhea and the feces are swarming with parasites.

Intestinal Coccidiosis

When the intestines are heavily infested the disease usually takes a more acute course, sometimes carrying off young individuals in a few hours after symptoms showing dullness, apathy, anorexia and coma. In these cases the disease may be mistaken for hemorrhagic septicemia, and as coccidiosis is often coexistent with that infection, it is possible to obtain a definite diagnosis only by bacteriological methods. In less acute cases, the symptoms are dullness, apathy, anorexia, emaciation, diarrhea and marasmus. In more chronic cases the abdomen becomes ascitic, as no doubt the liver

is also implicated, and there is a coexistent infestation of the liver and the intestines.

Nasal Coccidiosis, Malignant Catarrh or Snuffles

This seldom occurs without intestinal coccidiosis being present at the same time. It may, however, be coexistent with infectious rhinitis and influenza. The nasal canals probably become infected from the dung if the droppings are not kept cleared away when the disease is present in the intestinal or hepatic form. The symptoms are dullness, appetite poor, fur dull and rough, sneezing and a discharge from the nose, at first serous and watery but later becoming mucoid and purulent. The nasal discharge glues the nostrils together and soils the fur on the breast and forelegs. There is profuse salivation, which wets the breast, shoulders and forefeet. There is persistent coughing and sneezing and the temperature gradually rises to 104° F. to 105° F. The breathing becomes difficult and later on abdominal, with much panting and pumping. Emaciation and great weakness set in and death during convulsions terminates the animal's suffering.

Post-Mortem Lesions

The blood is pale and watery, the tissues anemic and pale. The liver is found enlarged, showing on its exterior a number of raised

whitish-yellow nodules varying in size from that of a millet seed to that of a peanut. As a rule the whole organ is involved, but in some cases only one lobe may be affected. On section of the liver the nodules are found to be distributed throughout the hepatic parenchyma, sometimes to such an extent that there is very little left of the liver substance. The nodules contain a whitish, purulent fluid in which are found coccidia, degenerated epithelial cells, fat and crystals of cholesterin. The nodules are, in fact, simply dilatations of the bile ducts. The lumen of the bile ducts may be crowded with coccidia in various stages of development, broken down cells and leukocytes. The epithelium of the ducts is found to be invaded with the parasites and the submucosa infiltrated with small round cells. Occasionally the gall bladder is also invaded, causing thickening of its walls and damage to the cells of its lining epithelium. In very chronic cases the liver may become completely cirrhotic with large cyst-like cavities which are the remains of degenerated and obliterated bile ducts.

In the intestine the mucous membrane is found studded with nodules of punctiform appearance, and in a state of catarrhal inflammation, covered with an exudate and showing small areas of ulceration. The exudate contains coccidia, degenerated epithelial cells and

fat globules. The submucosa is in a state of inflammation and round-celled infiltration, and may contain coccidia. Immature coccidia may also be found in the mesenteric glands.

In nasal coccidiosis the nasal and pharyngeal mucous membrane is found to be in a state of catarrhal inflammation covered with an orange colored exudate which contains coccidia. The eustachian tube may also be invaded and the external auditory canal, the middle ear and the tympanum.

Differential Diagnosis

Coccidiosis may be mistaken for tuberculosis, pseudo-tuberculosis and cysticercosis, and the only reliable means of differentiation is by the microscope, although the fact that the lesions are confined to the liver and intestine is not suggestive either of tuberculosis or pseudo-tuberculosis, both of which diseases being found to be more generalized.

Diagnosis during life is determined by the clinical symptoms and the detection of the parasite during life, but in the cases of nasal coccidiosis the fact that it may be only a complication of some other disease should not be lost sight of.

Treatment

Prophylaxis is by far the most important and has been fully dealt with under the caption hygiene.

Medicinal treatment consists of iron tonic and intestinal antiseptics, stimulants as required and cerebral sedatives if brain symptoms develop. Saccharated carbonates of iron should be given in from five to ten grain doses. Tincture of catechu, sulpho-carbolates of calcium, zinc and sodium, and Dover's powder, are especially indicated, and sodium bromide as a cerebral sedative.

The appetite should be tempted with a varied and sustaining diet, but fresh, wet, green stuff should not be given; it should be allowed to wilt before being fed. In fact, fresh, wet, green stuff should not under any circumstances ever be fed to rabbits, as for some unexplained reason it seems to favor the invasion of the coccidia. There is no scientific explanation for this fact, but the fact remains, and such diet should be avoided.

The bodies of rabbits dying from coccidiosis should invariably be cremated, not fed to dogs or cats, or left lying on the manure heap, and the dung from infected animals should not be used as fertilizer.

CHAPTER IV.

RABBIT SEPTICEMIA

Hemorrhagic Septicemia of Rabbits

This disease, classed for convenience as a pasteurellosis, makes its appearance in many instances without the channel of infection being apparent, but in the majority of outbreaks the contagion can be traced to infection from individuals suffering from the disease and passed on by feces, infected hutches, baskets, etc.

Etiology

The cause of rabbit septicemia is a bacterium identical in its morphology, staining properties, and cultivation with that of avian cholera. It occurs as a small ovoid bacterium, which stains well at either extremity but poorly in its centre. It is Gram negative, grows well on ordinary culture media, but assumes a different form than when recovered from the blood or intestine. The bacilli grown on culture media are coccobacillus in form; those isolated from the blood are ovoid, and those from the intestine take the form of a very small bacillus. All forms are non-motile, aerobic, and do not produce spores. The bacillus is named, *B. cuniculicida*.

Symptoms

The manifestations of rabbit septicemia dif-

fer according to the mode of infection. When infection takes place from ingestion, i. e., via the digestive tract, the disease runs an acute course with predominating gastro-intestinal and systemic symptoms. If, on the other hand, infection occurs via the respiratory tract, it runs a more chronic course with nasal and pneumonic symptoms more in evidence. This latter train of symptoms constitutes rabbit influenza, contagious snuffles or malignant catarrh, as it has been diversely termed. In the acute form the animal appears dull, hunched up, and separates from its companions. Its ears droop, always a sign of illness in a rabbit; its fur is dull and rough and appetite is suspended. Respiration becomes accelerated, coma gradually supervenes and the animal dies without a struggle. Colicky pains and a blood-stained diarrhea are prominent symptoms and the animal succumbs in from ten to twenty hours, but in rare instances may last up to three days.

In the pneumonia form, there is a profuse nasal discharge, frequent cough and sneezing, hurried respirations, heaving flanks and very often a purulent conjunctivitis. The disease if uncomplicated by the intestinal form runs its course to death in from a week to ten days, emaciation being very rapid.

Post Mortem Lesions

Intestinal form: The abdominal and pectoral muscles show infiltrations and petechiae, the intestinal mucous membrane is hyperemic, thickened and covered with a brownish red exudate. The lungs congested and the pleural cavities filled with reddish exudate. There is a sero-fibrinous pericarditis, the pericardial sac containing a blood-stained fluid. The liver is slightly enlarged and the spleen congested.

Pneumonic form: The nasal and bronchial mucous membrane is congested, the lungs pneumonic and the pleura covered with a fibrinous exudate. The liver is much congested, but little alteration is seen in the spleen. In both cases the blood is tarry and decomposition sets in rapidly after death.

Treatment

No treatment has proved of value. Prophylaxis consists in good hygiene and sanitation and the use of bacterins.

CHAPTER V.

MISCELLANEOUS INFECTIOUS DISEASES

Schmorl's Disease (Necrobacillosis)

This is a contagious disease characterized by necrosis of the skin of the head, lips and nose, or by the formation of small abscesses which appear on the thighs, abdomen and flanks.

Etiology.—The bacillus of necrosis—*B. necrophorus*.

Mode of Infection.—The bacillus gains entrance to the tissues via small wounds in the region of the head, produced by thorns, prickly food, or by ingestion of infected material. The wounds in the intestinal mucous membrane produced by internal parasites may also afford channels of infection.

Symptoms.—The symptoms vary according to the mode and intensity of the infection and also whether generalization or not takes place. The primary symptoms commence with swelling of the nostrils and lips, eyelids and ultimately the whole face. The skin is at first hot and painful, of a purplish color and covered with pustules; later on it becomes cold and insensible and brownish black. The necrotic area sloughs off, taking with it the lips, nose and part of the face. The resulting wound is dry, and shows marked induration around its margins. Very often the necrosis extends from the

lower lip over throat and chest and symptoms of generalization manifest themselves. The animal becomes dull and listless, rapid emaciation takes place, the respirations hurried and difficult, and the temperature rises. The animal relapses into coma and dies unconscious. Owing to the destruction of the lips, starvation may terminate the sufferings of the animal before the later symptoms appear, much depending on as to whether both lips are involved or not and to the extent of the necrotic process. The symptoms of a generalized infection, in which the lips are not involved and the necrosis is not in connection with any visible wound, manifest themselves by the appearance of multiple abscesses, varying in size from a pea to a hickory nut, in the regions of the thighs, flanks, abdomen and back. The capsule of an abscess typical of this disease is dense and fibrous, very slow in developing with little or no tendency to open spontaneously. The pus is thick and creamy and white or bright green in color. The course of this form of the disease runs about from two to three weeks, emaciation is extreme and the animal dies of exhaustion.

Treatment.—Very little can be done in the way of treatment except in the very early stages. If the condition is recognized then and the necrotic process has not involved too great an amount of tissue, total excision of the necro-

tic patch and subsequent dressings with tincture of iodine may succeed in arresting the involvement of fresh tissues and in localizing the infection.

Streptobacillary Pseudotuberculosis

This disease is characterized by the formation of nodules or tubercles resembling true tuberculosis, but animals affected do not react to tuberculin, the etiological factor being a specific streptobacillus. The bacillus appears as a short rod, measuring 1 to 2 microns long and having rounded extremities. Chain formation is frequent and the bacillus assumes varying forms, depending on the conditions and locations in which it grows. In culture media, it varies from the typical rod shape in fresh cultures to the ovoid form in old cultures; it has a tendency to form zooglea. In the tissues variations are frequent, depending on the age of the growth. It is a facultative anaerobe, stains with ordinary aniline dyes, but is Gram negative.

The disease attacks rabbits of any age and is very fatal.

Symptoms.—Gradual and progressive emaciation, with great weakness, disinclination to feed or exercise. Panting respirations, fur dull and rough. The greatly enlarged abdominal and sublumbar lymphatic glands can easily be palpated. The submaxillary and prepectoral

glands are often enlarged. The disease runs a chronic course, the animals gradually sinking from marasmus and inanition.

Post Mortem Lesions.—Lungs studded with caseous tubercles, the liver and kidneys also the seat of numerous tubercles. Tubercles are also found in the cecum and colon, and especially the vermiform appendix, which is enlarged and thickened with tubercle formation. The abdominal lymphatics are enlarged and in some cases also the bronchial and mediastinal glands.

Differential Diagnosis.—Microscopic examination of the lesions show that the tubercles are not typical of true tuberculosis. Tuberculin test negative. Acid-fast bacteria are not present in the lesions.

Contagious Urethritis and Vaginitis

This contagious venereal disease appears as a catarrhal discharge from the penis or vagina. It is communicable from animal to animal by coitus. It remains localized and is amenable to treatment.

Treatment.—Injections into the genital canal of either sex, of weak solutions of potassium permanganate, 1% solution, protargol, etc., and the internal administration of hexamine in three grain doses twice daily. The external genitals should be kept free from discharge and coitus prevented until all discharge

has ceased. The disease runs a normal course of three to four weeks or longer if treatment is neglected.

Tuberculosis

Although not by any means immune from infections by the *Bacillus tuberculosis*, the disease is not so very common in the rabbit. Intestinal tuberculosis is most often met with, although generalized infections are occasionally found post mortem. The symptoms, which may easily be confused with coccidiosis or pseudotuberculosis, are general unthriftiness, gradual emaciation in spite of generous diet, continued rise of temperature, panting respirations and upon palpation enlargement of the abdominal lymphatic glands. It is desirable in cases of suspected tuberculosis, to carry out the ophthalmic eye test of Calmette, a drop or so of ophthalmic tuberculin producing a purulent conjunctivitis and edema of the eyelids. Cases that react should be destroyed, as treatment is contraindicated owing to the risk of the spread of the disease to healthy individuals. The bodies should be burned and the hutches and runs thoroughly disinfected.

CHAPTER VI

DISEASES OF THE SKIN

Apart from the invasions of the necrosis bacillus, skin lesions in the rabbit are almost invariably produced by ectozoa. The exception is found in dermatitis of the hocks.

Dermatitis of the Hocks

This is the result of allowing wet and dirty litter to accumulate in the hutches. The hocks become swollen tender and often raw from the irritant effect of the ammonia in the feces and urine.

Treatment: Keep the hutches clean and apply a little zinc ointment thoroughly rubbed in, after the parts have been well washed with soap and water.

Fleas

In badly managed rabbitries fleas soon make their appearance and adversely affect the condition of the animals by the constant irritation they produce. The rabbit flea *Pulex gonioccephalus*, the dog flea *Pulex serraticeps* and the *Pulex irritans* of man are the varieties that infest the rabbit. Lop-eared rabbits are said to be more frequently affected than other varieties of rabbits, this being accounted for by the fact that these animals, by reason of their long ears are unable to clean themselves as easily as the ordinary rabbit. The more probable explana-

tion is that fanciers keep lop ears rabbits in hutches in which the temperature is excessive and only clean the hutches out at long intervals.

Treatment: The animals should be dusted with pyrethrum powder and well brushed and combed and, since fleas are transitory parasites, the hutches and living quarters must be well scalded with boiling water to destroy the larvae.

Lice

As a rule, lice are found only in badly managed establishments and on badly nourished and debilitated individuals. The rabbit louse *Hematopinus ventricosus* is a true blood sucker and, if present in large numbers, produces anemia and marasmus. A dermatitis is also produced, and the animals are continually scratching and biting at themselves, the fur becomes ragged, covered with nits, and the skin erythematous in patches and sometimes abraded by the animal's claws.

Treatment: The adult lice can be destroyed by dusting with insect powders or by sponging with an infusion of stavesacre, 1 to 20. The nits are best dissolved by wetting the fur with acetic acid or vinegar and combing out. In any case, the treatment should be carried out at least twice at intervals of five days, in order to

destroy any lice that have hatched out from overlooked nits. All litter should be burned and the hutches disinfected.

Acarina, Mites

Among the minor acarids that infest the rabbit are the *Listrophorous gibbus*, the *Gamasus pteroptoides*, and the *Leptus autumnalis* or harvest bug. This latter, formerly considered to be a distinct variety, is in reality the hexapod larva of the *Tetranychus autumnalis*. Neither of these parasites are of very much importance unless present in great numbers, when they produce irritation, loss of fur and self-inflicted injuries from rubbing and scratching. They are easily got rid of by the use of insect powder or infusion of stavesacre, or the calcium sulphid mange lotion.

Psora or Mange

Mange in the rabbit is of serious import and causes considerable losses unless diagnosed early and energetic steps taken for its treatment and control. Four varieties of mange parasites are found affecting rabbits. (1) *Sarcoptes scabiei cuniculi*, (2) *Notoedres minor cuniculi*, (3) *Psoroptes communis cuniculi*, (4) *Symbiotes cuniculi*. The first and second named are burrowing parasites and produce respectively sarcoptic and notoedric mange. As the symptoms of the two varieties are identical, they will be described together.

The lesions occur almost exclusively on the nose, lips, forehead, and legs and have not been observed on the body. Affected animals rub against the sides of the hutch, scratch themselves, and show great irritation. The fur falls off and the skin is seen to be covered with white or grayish crusts. The crusts are extremely adherent and there is much proliferation of the epithelium. If unchecked, the animals gradually lose condition owing to continued irritation and want of rest, and possibly to the absorption of toxins produced by the parasites. Many of the affected animals die from inanition and marasmus.

Treatment: Coincident with the treatment of the individuals, the hutches should be thoroughly disinfected and all affected animals isolated from the rest of the rabbitry and also from horses, as the sarcoptic variety is contagious to horses.

The hair should be clipped from the affected parts and the crusts softened by the application of soft soap well rubbed in and left on for half an hour, and then washed off with warm water. Sulphur ointment, 1 to 4, is then to be thoroughly rubbed into both the affected parts and a wide margin of the surrounding skin. The treatment should be repeated every five days until a cure is effected. In order to obtain the best results from the sulphur ointment

the crusts must be softened up with the soft soap and should then be scraped off as much as possible, but without causing too much damage to the skin.

Psoroptic and Symbiotic Mange

Psoroptic and symbiotic mange in the rabbit affects the ears, causing otorrhea or canker. It is transmissible to horses and from horses to the rabbit, so that rabbits should be removed from stables if either horses or rabbits become affected.

Symptoms: The rabbit is continually shaking its head and resents handling of the affected ear. Upon examination, a catarrhal condition of the external auditory canal will be found, the discharge being of the characteristic brown color and distinctive odor. If the base of the ear is pressed pain is exhibited and a sucking noise is heard. The discharge cakes on the inside of the earflap, and may produce ulceration and excoriation. In advanced and neglected cases, the animals may exhibit convulsions of an epileptiform character. Unless attended to, rabbits rapidly lose condition and soon become emaciated, lose their appetites and die of marasmus and inanition.

Treatment: The earflap and external auditory meatus and canal should first be thoroughly cleaned up with hydrogen peroxide, taking care to remove all scabs and caked discharge.

The parts should then be dried and the canal filled up with an ointment composed of Unguentum Hydragyri Nitratis, one dram, olive or almond oil, one ounce; the earflap is also well smeared with the ointment and the dressing repeated in three days' time. Should any irritation remain after the second dressing, the parts should be again cleaned up and dusted with boric acid powder. The ordinary sulphur ointment also gives good results if the preliminary cleaning up is thoroughly done and the ointment carefully worked into every crevice and cranny of the ear and canal.

Ringworm

Young rabbits up to the age of three months of age are often affected with favus; older animals are seldom attacked, seemingly being immune. The causative agent is the *Achorion quinckeanum* (Favus of mice) and the *Achorion schönleinii* (Favus of man). Favus is a contagious disease, and the usual precautions as regards isolation and disinfection should be adopted. It is also contagious to man, so that care must be exercised to prevent becoming infected. The predilection seats are: the head, ears and paws. The lesions vary in number from one to thirty, and in size from that of a pin's head to that of a dime. The lesions are very typical, occurring as depressed cups covered with a yellow crust, which in old lesions

becomes of a grayish color. On removing the crusts, the cup-like depression is seen covered with a grayish powder; the edges of the lesion are inflamed and the surrounding skin is much thickened, very often raising the entire lesion appreciably above the skin level. The lesions are devoid of hair, which breaks off and is found to be much frayed and split. The lesions also give off a characteristic mousey odor, which in conjunction with the macroscopic appearances, makes diagnosis quite simple.

Treatment: The crusts should be removed, any broken hairs pulled out, and the hair around the lesions clipped. Both crusts and hairs should then be burned. The lesion itself may then be painted with tincture of iodine, or swabbed with gasoline and painted with a solution of bichlorid of mercury, 1 to 500. A solution of ferric chlorid also gives good results and has the advantage of being non-poisonous; it is especially useful where large areas require to be treated. In obstinate cases silver nitrate may be used by moistening a caustic stick and rubbing the lesions with it. In any case, the application of any of the above mentioned fungicides should extend well beyond the periphery of the lesion, due precautions being observed, of course, to avoid injuring the eyes, lips or nostrils.

CHAPTER VII

OBSTETRICS

Breeding

Breeding from immature animals invariably leads to disappointment and disaster, and rabbits are no exception to this rule. With the exception of Flemish giants, mating should not be allowed before eight months of age. In the case of Flemish giants, which tend to become sterile if not bred before eight months, six months is the most favorable age to start breeding. Stud animals should be selected from individuals that have been well reared, correctly fed and have never had a set-back and are in good physical condition. The maximum number of litters that should be expected from a doe per annum is four; an excess of this number not only wears out the doe, but produces weak offspring.

Estrum occurs about every three weeks in the early part of the year and continues for three or four days.

The signs of estrum are restlessness, excitability, congestion and tumefaction of the vulva and vagina, with the usual discharge from the former. Any signs of nervousness on the part of the doe when introduced to the buck indicates that estrum is not fully established, and she should be removed and tried again next

day. One mating only should be allowed. Old does which are moulting in August, September or October, as a rule, will not come in estrum unless fed an increased protein ration and the diet considerably increased.

Period of Gestation

The length of gestation is thirty to thirty-one days and many does begin to make their bed about a fortnight before parturition is due. When signs of the desire to make the bed are seen, a nest box and a liberal supply of hay should be provided and the animals not interfered with. Signs of bed-making a few days after service is an indication that conception has not taken place, and the doe should at once be reintroduced to the buck. During gestation the usual routine of hutch cleaning, etc., should be carried on and as long as the nest is not interfered with the doe will not be disturbed by such measures even when the litter has arrived.

Treatment of the Expectant Mother

No special treatment is required for the first fortnight, but from that time on the enceinte doe should receive a more generous and concentrated nitrogenous diet. Roots should be given with extreme moderation, but grass in summer may be given *ad lib.* In winter cabbage leaves must be substituted for the grass, but care must be taken to see that they are not

frosted. Drinking water should always be provided in the hutch.

Number of Young

A fair average is five, but this can be increased by selecting prolific breeders, but much depends upon the strain, and there is little advantage to be gained in increasing the number of young if the mother is unable to properly nourish them.

Parturition

Parturition is usually rapid and uncomplicated and the doe, once she has retired to her nest, should not be disturbed. The nest should be left undisturbed for some days after the birth of the young rabbits or the doe may desert them and they will die of starvation. In any case owing to the fact that does nurse the young in the early morning, the nest should not be opened until after eight o'clock in the morning. When opening the nest for the first time the doe should be given some green food and the nest opened with a stick or with the gloved hands that have been well rubbed with earth. The young rabbits are born naked, blind and deaf, thus differing from the leveret, and are absolutely dependent on the doe for warmth and nourishment. Some does devour the new born rabbits, but this can be prevented

by keeping her supplied with plenty of drinking water and not interfering with the nest too soon.

The Young Rabbits

The young rabbits become covered with fur about the fifth day, the eyes open on the ninth to the eleventh day, and they begin to leave the nest about the fifteenth day. At three weeks old they are able to run about and are fairly "on their feet."

Care of the Nursing Mother

The ordinary ration should be increased at least one-third for the nursing mother and if the litter is exceptionally heavy special feeding on bread and milk is desirable as it is most desirable that the young ones should get no setback. As before mentioned the proper albuminoid ratio for nursing does and young rabbits is one to four or five.

Weaning

The young should be left with the doe until they are six weeks old in summer and eight weeks old in winter, and should share the doe's food. At these ages the young should be removed to a separate run and the members of the same litter should be kept together until they reach the age of three months, when the sexes should be separated. Under no consideration should the litter be broken up into pairs

and raised in separate hutches, as young rabbits require plenty of exercise and company. There is no objection to raising several litters of the same age together in large pens, but the ages should not be mixed. Bucks may be left together until they start fighting, when they must be separated, or those not required for breeding purposes castrated. In calculating the number of bucks to retain for breeding, one buck to ten does is the correct number, the remainder unless intended for sale as breeders should be castrated and fattened for the table.

CHAPTER VIII

MISCELLANEOUS DISEASES AND WOUNDS.

Anorexia

This may be the first symptom of some more serious disease or may be due simply to unattractive food, simple indigestion from inappropriate diet, damaged or spoiled food or exposure to extreme cold and general discomfort from uncomfortable surroundings.

Treatment.—After careful examination to determine the cause and the elimination of more serious maladies, a mild stimulant should be given and the appetite tempted with fresh grass or other green foods given in small quantities. Aromatic spirits of ammonia five minims diluted in a tablespoonful of water, administered twice a day, is a good example of a stimulant for a rabbit. A slice of bread may be soaked in good beer and offered as a meal, or an ounce of ale warmed up may be given as a drench. The comfort of the animal should be considered and adverse conditions rectified.

Catarrh or Coryza

Rabbits exposed to inclement weather and kept in damp hutches which are allowed to get into an unsanitary condition, often suffer from nasal catarrh associated with a catarrhal con-

conjunctivitis, independently of the catarrhal conditions produced by coccidiosis. The symptoms are far milder than in the latter disease. Nevertheless the possibility of coccidial infection should not be lost sight of and the usual precaution of isolation should be carried out.

Symptoms.—A catarrhal discharge from the nose accompanied with cough, anorexia and general listlessness. The conjunctiva is congested and there is a catarrhal discharge from the eyes. A microscopical examination of the nasal discharge and feces should be made and the absence or presence of coccidia determined. The rabbit's feces quite frequently contain a few coccidia as a very large percentage of rabbits are carriers but the finding of only a few in the feces and none in the nasal discharge will confirm the diagnosis of simple catarrh.

Treatment.—Isolate and provide comfortable quarters, clean and dry, warm but with proper ventilation and provide plenty of fresh, clean water. Soft hay and mashes should be given as diet, and ten minims of etheris nitrosi given in a little milk twice daily. The eyes and nose should be bathed two or three times a day with a five percent solution of boric acid and kept free of discharge.

Hematuria

Whether this condition is a true piroplas-

mosis or not is not yet definitely determined; if so it is in all probability conveyed by a tick, but the fact that rabbits usually recover from the disease rather points to some other causative agent. It is more probable that the diet has much to do with producing the condition, especially green stuff gathered from hedge-rows, etc., where are to be found many acrid weeds and grasses that might easily irritate the kidneys.

Hematuria, it should be remembered, is also a symptom of advanced coccidiosis.

Symptoms.—The animal is dull and listless, appetite as a rule unimpaired, and the urine is colored by contained blood.

Treatment.—Chiefly dietetic. The animal should receive an ounce of water, in which bran or barley has been soaked for twenty-four hours, twice daily. The diet should consist of the usual ration of meal, and hay, but grass and green stuff should be withheld. Recovery usually takes about a week to ten days.

Paraplegia

Rabbits that are kept cooped up in small hutches and are not allowed sufficient exercise or are kept in damp and insanitary surroundings often develop paralysis in the hind legs. The exact pathology of this condition is not known, but it seldom attacks animals kept under favorable conditions of exercise and sanitation.

Symptoms.—The initial symptoms are stiffness of carriage of the hind limbs, a dragging gait, and finally paralysis of the hind legs which are dragged along the ground when the animal moves.

Treatment.—The fur should be clipped short over the loins and a stimulating liniment well rubbed in, or a mustard plaster may be applied. A dose of magnesium sulphate should be given and sodium salicylate, grs. i, given mixed in the food twice daily. Two grain doses of sulphate of iron and sodium bromid made into a pill should also be given once daily. The animal should be made comfortable and kept dry and warm.

Fits and Convulsions

These occur from reflex action, from gastrointestinal irritation due to parasites or indigestion. They also appear in advanced cases of otorrhea. Sometimes no cause can be assigned or traced to account for these cerebral disturbances. Parasite cysts in the brain are no doubt sometimes responsible but such occurrences are rare. Exposure to the direct rays of the sun during very hot weather is also a factor in producing cerebral disturbance and as such should not be overlooked.

Symptoms.—The head is carried stiffly and to one side, limbs weak and the gait staggering. The eyes take on a wild expression and the

animal falls to the ground in convulsions which are of a violent nature. Sometimes the animal utters piercing cries before becoming insensible. Upon regaining consciousness the animal is completely exhausted and lies limp and relaxed, if picked up the head lolling to one side and the heart is felt to be only feebly beating.

Treatment.—Remove to a quiet place, and if able to swallow administer a saline purgative such as a dram of Glauber salt in an ounce of water. This may be repeated for two or three days until the bowels are freely relaxed. A sedative should be given, such as potassium bromid five grains three times a day for three or four days. Any digestive derangements should be corrected—parasites removed from the digestive canal or ears and the animal placed in a cool and comfortable hutch. The food should consist of grass, hay and roots for a week after an attack.

Wounds

Wounds in rabbits heal rapidly under suitable treatment. The wounds most commonly met with are bites from other rabbits and tears in the skin from projecting nails and splinters. Slight wounds and abrasions are best dealt with by cleaning up with a dilute solution of potassium permanganate or chinosol and dusted over with boric acid powder. Large

tears and extensive wounds should be sutured with fine silk or waxed thread properly sterilized after first disinfecting them.

Septic wounds are treated according to the general principles obtaining in the treatment of wounds in other animals, but care must be taken not to employ antiseptics that are too strong or poisonous if licked off. Eusol is a safe and useful agent for infected wounds but has the disadvantage of being rather irritating. This can be overcome to some extent by diluting it with three parts of boiled water.

PART II

Some Special Clinical and Therapeutic Notes on Diseases of the Cat

CHAPTER I

GENERAL CONSIDERATION OF THE FELINE PATIENT

In dealing with feline patients special consideration must be paid to the psychology of these animals far more than is necessary in the equine or canine species. In feline practice, details that are of minor importance in other animals, assume such importance that the patient's recovery may depend altogether upon them. Nauseous drugs, rough handling, a strange place, odors, the presence of dogs or other animals, all have a psychic influence which may result in obstinate refusal of food and a condition of inanition which may lead to a fatal termination quite irrespective of the actual pathological condition.

In cases admitted to veterinary hospitals, nostalgia plays a more important part in the recovery or its failure, than is generally attributed to it. For example, it is well known that many cats die in hospitals after being subjected to the operation of oöphorectomy, hysterectomy or other laparotomies and operations in general without any discoverable lesions, no toxemia, no local or generalized peritoneal inflammation or any other complication of the operation, the only symptoms during the post operative period until death, being

obstinate refusal of food, inanition and marasmus. That these deaths are attributable to nostalgia and to no other cause can be proved by comparing the percentages of mortality following operative procedures carried out at the home of the patient with those carried out among strangers and amid strange surroundings, as in a veterinary hospital. Also by comparing the results of operations performed at the hospital (where they should be) within twenty-four hours of admission with the results of operations when the animal has been allowed to become accustomed to its surroundings by residence in the hospital for at least a week previous to operation. The results of such an investigation and comparison will not only surprise the practitioner but will convince him that nostalgia plays an important part in the therapy of feline patients.

The cat is often considered by people that have not carefully studied the animal, to be of filthy and unclean habits; and while this may be true of untrained and neglected individuals, it is very far from the truth as regards the average cat. The normal healthy cat is most particular as to its toilette, and any neglect of the details of personal cleanliness is a sign that there is some deviation from the normal—a symptom that may indicate illness.

The fact should also be borne in mind, cats

become attached to places and rarely to individuals; they will tolerate people they are accustomed to, allowing them to handle, feed or administer medicine to them without protest, whereas with strangers, they often refuse food, resist handling, and make full use of their natural weapons of defense when submitted to examination for the purpose of arriving at a diagnosis.

The cat when sick has the common characteristic of all felines, that it invariably retires to some secluded place and hides; this tendency coupled with neglect of the toilette is of great value in arriving at the conclusion that the animal is or is not well.

The old saying that a cat has nine-lives is in some ways correct, in others misleading; that the cat must be immune or nearly so to a host of bacterial infections is proved by the fact that, compared with other animals, the bacterial diseases of the cat are few, especially when one takes into consideration the chances of infection that a cat is exposed to, by its wandering habits and garbage can investigations, etc., coupled with the constant cleaning of the coat by licking. The highly strung nervous system and remarkable agility of the feline no doubt enables him to avoid accidents and injuries to which a slower and less agile animal would fall a victim. On the other hand, the injured or

sick cat appears to have a remarkably low resistance to invading organisms and succumbs to what in other species are comparatively trivial conditions.

In conclusion, the veterinarian that recognizes and makes allowances for the peculiar psychological complications that accompany feline ailments will be rewarded by a greater measure of success than the one that does not make such allowances.

CHAPTER II
CHOICE AND ADMINISTRATION
OF MEDICINES AND
POSODOLOGY.

It is only comparatively recently that the cat has become regarded as a clinical entity, formerly it was treated on general principles following the line of canine medication, but as feline practice developed it was soon found by veterinarians that specialized in this branch of veterinary medicine, that what is quite applicable to the dog is not necessarily appropriate for the cat. As before mentioned, the peculiar psychology of the cat eliminates many medicinal agents which are commonly used in dog practice. Again closer investigation and clinical experience has shown that the cat possesses idiosyncrasies in regard to certain drugs, notably to all coal tar products, to morphine which causes delirium, to potassium chlorate which produces hemoglobinuria, and to nauseous tasting drugs, castor oil in particular, which although producing no toxic symptoms, in many instances provoke an obstinate anorexia and voluntary starvation if their use is persisted in. Keeping these facts in mind it will be seen that medicines should be administered, in either pill or capsule form if the

drug is at all nauseous, or in the food if practical where the drug is tasteless or better still where possible by hypodermic injection. Alkaloidal medication is ideal in feline patients owing to the small bulk of the dose, the certainty of action and the ease of administration. Pills and capsules are best administered by means of a pill gun as by this method the operator runs no risk of being bitten or the patient of being injured during the process.

Fluids are best avoided where possible; where used they should be given by means of a small syringe, administered slowly and delivered in small quantities at a time well on the back of the tongue. In large cats the cheek may be pouched in the same manner as in the dog but in small cats and kittens this method is not practical, usually resulting in bitten fingers and the loss of the dose.

Where it is desirable to administer the medicament in liquid form to large cats the dose should be regulated so as to be of as small a quantity as possible, except, of course, where irritant drugs are used, in which case they must be properly diluted to avoid irritation of the buccal mucous membrane. The medicine being already placed in a teaspoon, syringe or other convenient receptacle, the animal's mouth is closed, either by an assistant holding the jaws

closely together or by tying them together with a tape. The index finger of the left hand is then introduced at the corner of the lips and the cheeks pulled outwards to form a pocket, into which the medicine should be poured slowly until the animal has taken the required dose.

Medicines may also be given by the rectum. Rectal medication by means of suppositories is very appropriate.

The choice of medicinal agents for external application is very limited owing to the habit of licking which is normal to all felines. Only those agents that are nontoxic should be employed for external applications unless it is possible to eliminate the chances of their being removed by the tongue.

Preparations of coal tars, carbolic acid, iodoform, mercury, etc., must not be used, such agents as chinosol, eusol, chloromin, chlorazene, etc., being substituted for them. As to dosage, only general directions can be given, the general rule being that if the dose for the horse be regarded as one the dose for a medium sized cat is $1/32$ or about half the minimum dose for a dog. The proportions in regard to age are adults, six months and upwards, one part; three to six months, one-half part; two to three months, one-fourth part; 20 to 45 days, one-eighth part; 10 to 20 days, one-six-

teenth part. If the dose by the mouth be one; the rectal dose is two; the subcutaneous one-tenth; the intravenous, one-twenty-fifth to one-fiftieth; the intratracheal, one-twentieth.

CHAPTER III

DISEASES OF THE DIGESTIVE SYSTEM.

The Lips

In common with other animals the cat suffers from wounds and injuries both to the external and internal surfaces of the lips, also from neoplasms, and from diseases of the skin notably favus (see Page 119). These conditions are treated on general principles by suture, excision, and antiseptic treatment as the special condition demands. As before stated special care is necessary in the selection of a non-toxic antiseptic.

The Teeth

The dental formula of the cat is:

	3 3	1-1	1-1	1-1	1-1	
Temporary.	I.—	C.—	P.M.—	C.M.—	T.M.—	=26
	3 3	1 1	1 1	1 1	0 0	
	3 3	1 1	3 3	1 1		
Permanent.	I.—	C.—	P.M.—	M.—		=30
	3 3	1 1	2 2	1 1		

The carnassial in the upper jaw is a pre-molar, that in the lower a true molar. The teeth appear in the mouth in from two to three weeks after birth and are shed and replaced by the permanent ones between four and four and a half months. Full dentition is obtained between the sixth and seventh.

Ulcerative Stomatitis

As in other animals, defects and diseases of the teeth are productive of not only local troubles but of digestive, constitutional and nervous phenomena as well. In the cat, however, constitutional symptoms are more severe, loose, decayed or tartar coated teeth producing not only a septic condition in the mouth but a condition of inanition that is persistent until the exciting cause is removed. In old cats the teeth quite frequently become thickly coated with tartar, the gums become infected and often necrotic and the condition known as septic mouth is produced.

Symptoms.—Attention is drawn to the animal's illness by persistent anorexia, fetid breath, or more correctly by the fetor oris, salivation, and a general miserable appearance. Upon examination of the mouth, the teeth are found coated with tartar, the gums spongy, ulcerated, and with necrotic patches. Particles of decaying food may be found between the cheeks and the teeth and one or many of the teeth may be loose.

Treatment.—All loose teeth should be removed and the sound ones cleaned of tartar by scaling. One loose tooth is sufficient both to produce the condition and to maintain it and the majority of cats will undergo voluntary starvation rather than endure the pain of bit-

ing on a loose tooth. After removal of the loose teeth and the tartar from the sound ones the mouth should be rinsed with a nontoxic and nonnauseating mouth wash. Hydrogen peroxide, a weak solution of potassium permanganate and Dakin's solution are all suitable agents to employ. The diet should be of soft consistency and of easy mastication. Boiled fish, made into a pulp with milk is generally acceptable, but it may have to be placed in the patient's mouth before it will be eaten.

Catarrhal Stomatitis

This is a simple inflammation of the mucous membrane of the mouth. It occurs in cats, being produced by irritants, foreign bodies, slight accumulations of tartar, etc.

Symptoms.—Disinclination to eat, difficulty in mastication, a slight degree of salivation. Upon examination the mucous membrane of the mouth and tongue is noticed to be whiter than usual with parts denuded of the epithelium. The fact that both simple catarrhal and ulcerative stomatitis occur in feline distemper must always be kept in mind and the existence of that condition not overlooked.

Acute Pharyngitis

Excluding the acute pharyngeal symptoms of cat distemper, and cat diphtheria, acute pharyngitis is as a rule produced only by trau-

ma. Foreign bodies such as fish bones, pins, needles, pieces of stick, straw, grass, etc., are frequent causes. It may also be caused by extension of infection from the buccal cavity.

Symptoms.—Salivation, partial or complete anorexia, tendency to hide away, pawing at the mouth or throat. Examination reveals an inflamed condition of the pharynx and usually the foreign body. Sometimes however a careful search must be made before the offending article can be discovered especially if it be a needle.

Treatment.—Prompt removal of the foreign body, the application of an inoffensive astringent antiseptic such as glycerin tannin (tannic acid 1; glycerin 4) is all the treatment required. The patient should be placed on a soft diet and kept quiet for a few days.

Acute Peripharyngeal Abscesses

Acute peripharyngeal abscesses are of fairly frequent occurrence and are due in nearly every instance to foreign bodies such as needles and fish bones perforating the pharynx and lodging in the peripharyngeal tissues.

Symptoms.—In addition to the symptoms described above, pain and swelling in the affected region, difficult breathing, pain upon manipulation and finally the development of fluctuation in the swelling.

Treatment.—Evacuation of the abscess and appropriate antiseptic after treatment on general principles.

The pharynx in old cats is quite often the seat of chronic tubercular abscesses for which no treatment can be recommended (See tuberculosis, page 108).

The diseases and surgical condition affecting the esophagus of the cat in no way differ from the same affections in the dog (for which see Canine Medicine and Surgery).

Gastritis and Gastro-enteritis

These two conditions so generally go together and the differential diagnosis is so surrounded with difficulties and possesses no clinical advantage that they will be described together. Gastro-enteritis occurs in two forms; 1 Acute and 2 Chronic.

Acute Gastro-enteritis.—There is still some considerable contention among the various authorities as to whether this disease exists as a pathological entity, or whether or not all cases can be referred to distemper, with the exception of gastro-enteritis produced by poisons or whether the different varieties are separate entities. Clinically however the following forms of gastro-enteritis are met with and will be discussed under the following headings.

SIMPLE ACUTE GASTRO-ENTERITIS.

In this form the gastric symptoms predominate over the intestinal, and the nervous phenomena although existent are not so well marked as in the more serious forms.

Etiology.—Unsuitable and irritating food, foreign bodies, fur balls and masses of matted hair which have been licked from the coat when the animal has been making its toilette. Parasites, *Ollulanus tricuspis*, *Ascaris mystax*, etc., and irritant medicines.

Symptoms.—Anorexia, vomiting, pain on manipulation of the epigastric region, abdomen may feel full or may be tucked up, pain on pressure, diarrhea fetid, sometimes profuse and streaked with blood. The animal lies upon its belly with elbows on the ground, appears to be dazed and is generally completely indifferent to its surroundings. Refusal of food is persistent, the mouth has a sickly odor and the mucous membrane appears of a dirty white color. The temperature is generally raised two to three degrees but drops to subnormal if the case is going to terminate fatally. Emaciation is rapid, the diarrhea and vomiting become more persistent and finally deep coma sets in in which the patient dies.

Treatment.—Treatment depends to a great extent upon the etiological factor. If due to parasites whose presence can be definitely de-

terminated by a microscopical examination of the feces, a dose of calomel gr. 1 combined with a suitable vermifuge, such as oil of chenopodium M. 1 to 2 or santonin gr. $\frac{1}{2}$ and chloretone gr. 1 to 2 should be given.

Accumulations of hair may be diagnosed, partly by the anamnesis and partly by the doughy feel of the stomach and intestinal tract and by an examination of the feces. A dose of liquid paraffin followed by one of calomel will as a rule effect the removal of the offending matter, but in old debilitated animals recourse may have to be had to surgery. In these cases the prognosis should be very guarded.

In cases where the cause cannot be definitely ascertained, the possibility of distemper should not be overlooked but the absence of other symptoms will serve to eliminate this possibility. The contagious form of gastro-enteritis should also be borne in mind but again that also has distinguishing features.

The general line of treatment to be followed is first of all to eliminate the causative agent, by a mild laxative such as an appropriate dose of calomel (gr. 1) followed by gastric sedatives and gastro-intestinal antiseptics such as chloretone (gr. 1 to 2), bismuth subnitrate, (gr. 5), salol (gr. 2) or formidine (gr. 3). The mouth should be washed several times a day with a weak solution of boric acid or hydrogen perox-

ide and the diet restricted to diluted milk, egg albumin, or beef tea.

Food should not be forced on the patient in the early stages of the disease or until the stomach has quieted down to some extent but food should be given when the vomiting has been more or less controlled.

The after treatment consists in a well regulated non-irritant diet such as boiled fish and milk, a little finely scraped raw meat or boiled liver. To keep the bowels in a fairly relaxed condition, should constipation supervene as it sometimes does, sardines and oil should be given if the patient will accept them.

CONTAGIOUS GASTRO-ENTERITIS.

As before stated the pathological entity of this disease is questioned by some authorities who claim that it is only a phase of feline distemper. However closely these two diseases may be related theoretically the clinical pictures are so different, that in view of the fact that the actual etiological factor of neither has been isolated, it seems to be more practical to separate them, until such times as it is definitely decided to which category they belong. Since Boucek isolated an ovoid bacillus clearly of the hemorrhagic septicemia type while investigating an outbreak of what appeared to be contagious gastro-enteritis, further investi-

gation along that line should be profitable, and at any rate suggests to the clinician the experimental use of hemorrhagic septicemia bacterins when confronted with this formidable and fatal malady.

Etiology.—The causative agent has not yet been definitely determined; but an ultra visible virus and the bacillus of hemorrhagic septicemia both are suspected. In an epizootic of enteritis among young kittens, Phisalix discovered the colon bacillus, which is not surprising, that organism being a normal inhabitant of the intestinal canal.

Occurrence.—Adult cats are mostly affected, but no age is exempt. The disease is extremely contagious and may destroy every cat in a cattery in a very short period of time. It is very often quite difficult to trace the source of infection, but often appears after cat shows and appears to be introduced into the cattery by animals that have been on exhibition. At other times, the first cases will develop with no history whatever that can aid one in tracing the source of the infection. The mortality is extremely high and every precaution should be taken in the way of isolation and sanitation.

Symptoms.—These develop suddenly and with no premonitory signs. The first symptom as a rule is vomiting, or the passage of blood

per anus. The first vomit generally contains food, but later a thick slimy bile stained mucus is ejected. At first thirst is excessive and the animal makes attempts to drink, vomiting immediately afterwards; later on the animal will sit over a dish of water or milk in a half dazed manner and make no effort to lap or swallow. There is from the first complete anorexia, all food being absolutely ignored. Diarrhea is persistent, and frequent passages of very fetid and blood stained feces take place. Tenesmus and straining accompany defecation and add materially their quota to the exhaustion which is a prominent feature of the disease. The abdomen is very sensitive to pressure. Manipulation excites moaning and crying. The animal rapidly becomes semi-comatose, dull and indifferent to its surroundings, lying on its belly, elbows on the ground, and remaining immovable. The eyes are half closed and the menbrana nictitans is protruded, half covering the pupil. The coat becomes dull and stary, and soiled with vomit and fecal matter which the animal makes no attempts to remove. The mouth becomes septic and emits a fetid odor, the gums at first appear spongy, congested and bleed at the slightest provocation. The buccal mucous membrane becomes the seat of ulcerations and necrotic patches in which the tongue is also involved. The necrotic processes

extend to the alveoli of the jaws, the teeth become loose, and sequestra form in the bones of the jaw. Emaciation is rapid and the semi-comatose state merges into complete coma, the patient dying unconscious. In the first stages of the affection the temperature runs high, but as toxemia increases declines to normal and then to subnormal as death approaches. The visible mucous membranes are congested, and often icteric. In some cases the necrotic process extends to the posterior nares and there is a slimy blood stained discharge from the nostrils which if not removed excoriates the nares and lips.

In cases less acute the symptoms are somewhat modified and are not so quickly developed and the disease may assume a more or less chronic form, gradually yielding to treatment.

The absence of a catarrhal discharge from the nose and eyes and the fact that all the cases in an outbreak show the same type of affection, viz., gastro-enteritis with necrotic stomatitis, serve to differentiate this condition from feline distemper in which disease the catarrhal and pneumonic symptoms predominate, the gastro-enteritic symptoms being subordinate when present and in very many cases absent altogether.

It should be noted that the virulence in different outbreaks varies very considerably, the

disease appearing sometimes in a very mild form and with only comparatively slight disturbance, in others the disease runs a most malignant course with the above described symptoms greatly accentuated. Other complications sometimes arise as might be expected in such a purely toxemic disease, the chief among them being renal and cerebral.

Treatment.—Owing to the fact that the etiological factor is unknown the treatment is entirely symptomatic and based upon general principles, but at the same time directed to reducing the toxemia and eliminating and neutralizing toxins. In the early stages when the thirst is excessive and the power of lapping and swallowing is still in existence, acetozone 1-1000 should be given *ad lib.* and even later on the mouth and nares may be washed out with the same agent. To control the persistent vomiting and relieve pain chloretone gr. 1 to 3 may be given, either in powder dropped on the tongue and washed down with a little water, or in capsules.

Chinosol solution 1 to 1000 used both as a mouth wash and internally gives excellent results, being non-toxic and having the advantage of being acid in reaction thus neutralizing the secretions of the stomach which in this disease are always alkaline. For the same purpose hydrochloric acid 1-1000 solution may be

given every three or four hours in teaspoonful doses. Either the solution of acetozone or chinosol should be given three or four times a day and rectal injections of the same solutions at least twice daily. Dosage of these two agents is immaterial within reasonable limits as both are practically non-toxic and non-irritating in the dilutions named.

To stimulate elimination and also as a systemic stimulant, subcutaneous injections of normal saline solution should be given daily three or four ounces at a time. The mouth must be kept as clean as possible, by being frequently washed out with antiseptic solutions, loose teeth should be removed and necrotic shreds trimmed off.

Until vomition is controlled it is hopeless to try and give nourishment by the mouth and it is not advisable to do so. Rectal feeding has been suggested but seems to do more harm than good, consequently for the first twenty-four hours all food should be withheld, after that albumin, beef tea or beef jelly may be cautiously administered in small quantities, but not persisted in if vomition is occasioned.

The patient should be kept clean and free from soiling by gastric or fecal discharges. The lips and nose should also receive attention. The patient should be kept warm and comfort-

able, being supplied with a hot water bottle if cold and miserable.

DIFFERENTIAL DIAGNOSIS.—From feline distemper, by the absence of catarrhal and pneumonic symptoms and by the extensive and grave necrotic processes in the mouth. In distemper the stomatitis has a different clinical picture and is much more amenable to treatment.

From simple ulcerative stomatitis, by the absence or mildness of the systemic and gastro-enteritic symptoms as compared with contagious gastro-enteritis, and by the sporadic nature of the former affection.

From foreign bodies, obstruction of the bowels, intussusception, etc., by the sporadic nature of those affections, and by digital examination of the abdomen.

From poisoning, by the sporadic nature of those cases, the anamnesis, and from the peracute symptoms peculiar to cases of poisoning. The differential diagnosis from ptomaine poisoning is more difficult except that the latter is non-contagious, and the nature of the vomited matter is different. In ptomaine poisoning vomiting although persistent is not so effective, i. e., the stomach is not emptied so effectually as in contagious gastro-enteritis, and the reaction of the vomited matter at any rate in the early stages of ptomaine poisoning is acid, that

of contagious gastro-enteritis is invariably alkaline.

Ptomaine Poisoning

This affection is not of such frequent occurrence as in the dog, because the cat vomits with even greater facility than the dog. Nevertheless cases do occur and are very fatal unless prompt and rational treatment is instituted.

Etiology.—Bacterial toxemia from the ingestion of putrid and decaying food, putrid meat, fish, canned goods, such as salmon, sardines, corn, etc. The bacteriological flora producing the condition are the same as in other animals so no details are necessary in regard to them.

Symptoms.—Vomiting, abdominal pain, bloody and offensive diarrhea, widely dilated pupils, small weak but rapid pulse. The temperature is at first elevated but may later on become subnormal. Very great depression and rapid exhaustion. Sometimes convulsions followed by coma.

Treatment.—To produce emesis and expulsion of the offending material apomorphin in doses varying from $1/30$ to $1/20$ of a grain should be given hypodermically, and followed by two or three ounces of a 1-1000 solution of chinisol; if this is vomited it should be repeated in half an hour. To clear the intestinal tract calomel one-half to one grain combined with

one or two grains of chloretone should be administered. After the purgative has acted bismuth subnitrate five grains may be given to reduce irritability of the intestinal tract. Collapse and depression in the later stages may be combated by the hypodermic administration of atropine sulphate in doses of 1/100th of a grain repeated as required or caffeine 1/8th of a grain repeated as needed; the patient should be made comfortable and kept warm, using a hot water bottle if required. The after treatment consists in restricting the diet to easily digestible and non-irritant foods, offered frequently but in very small quantities at a time.

The other conditions and diseases of the digestive canal of cats offer no important differences from those of the dog, with the possible exception of the anal glands. In the dog impaction of these glands is of frequent occurrence, but in the cat rather the exception. The anal glands on the other hand are more frequently the seat of neoplasms in the cat than in the dog.

Foreign Bodies in the Stomach

Although with cats the tendency to swallow objects that are not food is not so common as it is in dogs, the variety of substances which may be swallowed either intentionally or accidentally while at play is so extensive as to pro-

hibit a complete list; but sticks, stones, pins, needles, bones, coins, and corks are among those generally met with.

Symptoms.—In many instances the patient shows no ill effects unless the foreign body either perforates the stomach or, passing on, blocks the intestines. Silver coins may remain in the stomach for years and cause no illness whatever, but copper coins undergo corrosion in the stomach or intestine and in time cause serious illness or death. In the case of pins, hat pins, and needles, their presence in the stomach is often unsuspected until an abscess forms either in the esophageal region, between some of the posterior ribs, or in the flank. The history of the case should be obtained and the habits of the animal inquired into, to determine whether the patient has actually been seen to swallow something, or is in the habit of picking up and swallowing odds and ends. The most prominent symptoms are attempts at vomiting, poor appetite, general dullness and depression, irregularity of the bowels, blood in the feces, general unthriftiness, and emaciation.

An examination with the Roentgen rays makes the diagnosis more positive. A careful digital examination should also be made through the abdominal walls, but this is very often negative.

Treatment.—In the case of small articles,

such as needles or small nails, the animal should be fed on soft or doughy food in order to inclose the foreign body during its passage along the intestine. Thick porridge is of good service here. An emetic of 1-20 to 1-10 grain of apomorphin often proves effectual in expelling blunt objects. If the emetic is unsuccessful, a cathartic should be administered.

In the case of hat pins, needles, meat skewers, or similar articles, it is better to await developments, since in the course of a few days the point will often work out, causing an abscess. When this is lanced, the foreign body can be grasped and withdrawn; if a hat pin, the head is cut off with wire cutters and allowed to fall back into the stomach; the abscess cavity must be treated antiseptically. The patient usually makes a rapid recovery. There is some risk of peritonitis, due to these substances perforating the stomach, but it is remarkable how seldom this occurs. As a rule adhesion takes place between the stomach and the peritoneum, thus cutting off the peritoneal cavity from infection. Where large substances, such as stones, marbles, or large nails, have been swallowed, and the diagnosis is positive, gastrotomy should be performed without delay.

The popular dread of powdered glass is

founded on a myth. Animals may ingest it without apparent harm.

For a description of symptoms, treatment, etc., of the remaining pathological conditions both medical and surgical of the digestive tract the reader is referred to Canine Medicine and Surgery, pages 55 to 65 inclusive.

Parasites of the Alimentary Canal

Ollulanus tricuspis, a small nematode worm, found in nests in the mucous membrane of the stomach.

Very often the presence of this parasite is unsuspected and discovered only on post mortem examination. Sometimes, however, in severe infestations it produces chronic gastric disturbances, anemia and marasmus. The same parasite is also found in the lung tissue and is often associated with the strongyle *synthetocaulus abstrusus*, producing broncho-pneumonia. The intermediate stage of this parasite is passed in the musculature of rodents.

Ascaris mystax is also found in the stomach, more especially in kittens having migrated there from its normal habitat in the small intestines. Sometimes the stomach is completely impacted with this worm, usually with fatal results.

Ascarides infestation is far more serious in kittens and in young cats than in adults, pro-

ducing if at all numerous digestive disturbances, indicated by vomiting, diarrhea or constipation, capricious appetite, anemia, and very often epileptiform convulsions. In extreme cases, the whole of the digestive tract may be blocked up with masses of coiled up and interwoven parasites. The above symptoms, in addition to the discovery of the parasites or their ova in the feces, the pot-bellied appearance of the animal and the doughy feel of the abdomen on palpation, confirm the diagnosis.

Cestodes.—The cestodes infesting the cat are the *Taenia crassicollis*, *Dipylidium felis* and *Mesocestoides litteratus*. The intermediate stage of the *T. crassicollis* is passed in the liver of rodents; the larval form is known as the *Cysticercus fasciolaris*. The intermediate host of the *Dipylidium felis*, the cat louse, or *Trichodectes subrostratus*, the larval form being the *Cryptocystis subrostratus*.

The tapeworm *Bothriocephalus latus* is also occasionally found, the intermediate host being a fish such as pike or perch. The symptoms produced are an unthrifty condition, with disorders of the digestive apparatus, sometimes nervous manifestations such as convulsions and fits. Their presence is definitely established by the discovery of segments or ova in the feces.

Other Intestinal Parasites.—The only other important parasites are the *Ankylostomum* fe-

lis (cati), or hook worm, which inhabits the cecum and, being a blood sucker, produces wasting and anemia, and the Oxyuris compar, or seat worm, which creates rectal and anal irritation.

Taken all together, the symptoms of parasitism are by no means pathognomonic, and the diagnosis should be clinical only by the finding of adults, segments or ova in the feces.

Treatment.—Adult cats should be starved twenty-four hours and given a purgative to clear the alimentary canal and allow the vermicide to gain access to the parasites. The following are useful agents for the removal of ascari-des: calomel gr. i, santonin gr. 85, or oil of chenopodium ℥ i-ii, given in two drams of glycerin or liquid paraffin.

Fluid extract of spigelia 5 to 10 minims combined with fluid extract of senna is also very efficacious and safe. For small kittens, after fasting for some hours, syrup of iodid of iron in doses of 10 to 15 minims is a safe and effectual vermicide. If preferred, the syrup of iodid of iron may be given twice daily for three or four days, the smallest dose being employed for tapeworms.

Areca nut from one grain up to half a dram and made up in pills with butter gives good results if given to the fasting animal and followed with a purge such as calomel or rhubarb.

Ethereal extract *Filix mass* in doses of 5 to 10 minims may also be given and is very effective, but some degree of caution is required to regulate the dose on account of its toxicity. Preference should be given to agents that can be administered in capsule or pill form as, if the drug used is of nauseous taste, the animal may refuse to eat after its administration.

For ankylostomiasis, thymol or oil of chenopodium should be given and followed by a course of iron tonic to correct the anemia. The syrup of iodid of iron is very suitable here, or if preferred the ordinary five-grain Bland pill may be substituted for the syrup.

For seat worms, rectal injections of vermicides such as infusion of quassia, solution of sodium chlorid, sulphate of iron, etc., should be employed and repeated daily for several days.

CHAPTER IV CONTAGIOUS DISEASES

Feline Distemper

Distemper is a contagious and infective disease of cats, that occurs either in sporadic or epizootic form. It is chiefly disseminated by means of cat shows, dealers' shops and humane societies' homes for lost and strayed dogs and cats. One attack does not confer immunity; if anything, it rather predisposes to future attacks. Many cats, however, have a natural immunity, and possibly some few may acquire it.

The virulence of the infection varies in different outbreaks, being more intense in districts or countries in which it first makes its appearance or which have been free from it for some time. Wet, damp and cold weather and unhygienic living places are predisposing causes. The period of incubation is relatively long, varying from one to three weeks.

Etiology.—The etiological factor has not yet been determined, although many organisms have been suspected, and the general consensus of opinion is that the disease is due to some ultra-visible virus and that the other organisms occurring during the course of the malady are only secondary invaders, but at the same time may be responsible for some of the symptoms which manifest themselves during the progress of the disease.

Cats showing no symptoms of the disease and in perfect health may be carriers of the infection. This is especially true of the female, who may infect litter after litter of kittens, although apparently in every way normal herself.

Symptoms.—The symptoms are complex and varying both in individual outbreaks and also in the individual. The disease may attack the respiratory, digestive, or cerebral systems, either singly, consecutively, or simultaneously, and with varying intensity. Thus in some cases the purely catarrhal form, unaccompanied by any other manifestations, may occur; in others, the symptom complex may occur, or rarely, the digestive tract may be the seat of the main invasion.

Cerebral symptoms are rarer than in the dog, and seldom appear as primary, but generally appear in the later stages of the disease, if at all. The following is a description of a typical case, but it must be remembered that all of these symptoms may be modified or intensified according to the virulence of the infection and the resistance of the patient.

The onset of the disease is usually ushered in with rigors, but these are often unnoticed, as the patient generally seeks to hide at the first feeling of malaise. The animal is dull, feverish, and seeks the warmth of the stove or fire.

The temperature at this stage is elevated several degrees, later it falls, and is variable throughout. It may even, in unfavorable cases, fall to subnormal. The visible mucous membranes are found to be dry, hyperemic and swollen; there may be coughing, sneezing, and choking.

Later there appears a catarrhal discharge from the nose and eyes, at first watery, but rapidly becoming purulent; the conjunctiva becomes much swollen and may protrude between the eyelids; the cornea is occasionally the seat of ulcerations, which, however, very seldom cause perforation as in the case of the dog. Very rarely, however, the whole eye becomes attacked with a panophthalmitis and is entirely destroyed (this nearly always occurs in kittens infected at birth or before their eyes have opened).

Salivation is noticed, the saliva being thick, sticky and ropy, ineffectual efforts at swallowing it result in choking noises and often vomiting. Upon examination of the mouth the mucous membrane is found to be congested, swollen and with little points of ulceration dotted over the surface, the pillars of the fauces are swollen and ulcerated and covered with a sticky mucus. The gums are spongy, bleed easily, and are ulcerated around their dental margins. Fetor oris is well marked.

In severe cases, in which the pharyngeal lesions are accentuated, the infection extends up the eustachian tubes, producing purulent otitis, and is usually fatal. Depression is well marked, anorexia complete, but thirst is excessive; vomiting, however, unless the case is complicated with severe gastro-intestinal symptoms, is not very persistent, being chiefly excited by the secretions of the mouth and pharynx.

In the absence of gastro-intestinal complications, constipation is usually present, but may give way to fetid diarrhea if the lower alimentary tract is involved.

In contra-distinction to the distemper of the dog, extension of infection to the bronchi and lungs is comparatively rare, but if such happens the symptoms of bronchitis and pneumonia either separately or associated, as the case may be, make their appearance. The temperature rises, the rate of respiration is accelerated and the usual signs can be detected on auscultation and percussion. Unlike the broncho-pneumonia of the dog, which is the typical pneumonia of distemper in that animal, the pneumonia of the cat is usually atypical; that is to say, it may appear in the croupous form, the catarrhal, or associated with pleurisy, i. e., pleuro-pneumonia. Pleurisy, in fact, is a com-

mon complication to the pneumonia of feline distemper.

Coincident with the foregoing symptoms signifying the involvement of the stomach and intestines, may appear persistent vomiting, the frequent passage of fluid and offensive feces, sometimes blood-stained, pain upon abdominal palpation. Emaciation is gradual but steady except in mild cases that can be induced to take nourishment.

Nervous symptoms such as convulsions, spasms of groups of muscles, or deep coma, may occur.

In some cases the pharyngeal symptoms prevail, the catarrhal and gastro-enteric being subordinate, the latter sometimes completely absent, the former always present, but sometimes much modified; in these the general toxemic symptoms develop very rapidly, the patient lapsing into deep coma ending in death.

Pregnant cats almost invariably abort.

Treatment.—In the absence of exact knowledge of the causative factor all treatment must of necessity be symptomatic and therefore to some extent empirical.

From close observation and careful review of the initial symptoms and further course of the disease, the author came to the conclusion a good while ago that the primary infection

takes place in the pharynx and tonsils and therefore considers that every effort should be made to disinfect, if possible, the pharyngeal and tonsillar areas. Clinical results when such efforts have been made have shown the efficacy of them, whether or no the hypothesis is correct. To that end, therefore, the nasal chambers, mouth, pharynx and tonsils should be douched with a 1/1,000 solution of chinosol, the solution should be syringed up the nostrils with a small syringe (a fountain pen filler is just the thing), the liquid being forced into the pharynx; the mouth should then be washed out with some of the same solution and about one to two ounces given as a drench.

This method of treatment should be instituted immediately symptoms appear and should be continued daily until convalescence. In the initial stages of the disease the douchings should be given at least three times a day, but as improvement takes place once daily is sufficient.

Constipation should be corrected with small doses of calomel and the other complications treated as they arise, and according to their nature. The basic principle in the treatment is the disinfection of the alimentary tract. Collapse and exhaustion may be treated with hypodermic injections of normal saline solution, atropin or caffeine.

Diet should be restricted to very small quantities of albumin and water, beef tea or jelly, diluted milk, etc., until the acute stage is passed, when the quantities may be cautiously increased.

During convalescence an iron and quinine tonic may be given with advantage and the diet should be of easily digested and highly nutritious aliment.

Throughout the course of the disease the patient should be kept clean and comfortable, and the infectivity of the affection should never be lost sight of, every effort being made to prevent the spread of infection to other cats.

Seeing the serious and treacherous nature of this disease and the losses sustained by owners of high-priced cats, it is hoped that more attention will be paid to this disease in the future and that investigations will result in a biologic agent of prophylactic or curative properties that will enable the practitioner to treat it with more confidence than is possible at the present time.

Feline Diphtheria

This is an infective disease of cats characterized by inflammation of the pharynx, with the formation of false membranes, and profound toxemia. This disease, one of the most fatal that affects cats, the mortality being about ninety percent in some outbreaks, has the char-

acteristics of the diphtheria of human beings, with the exception that the bacillus of Löffler has not been isolated from the lesions. Nevertheless it is probably very closely allied to human diphtheria, as the disease responds favorably to the antitoxin for diphtheria of the human. Some authorities, both medical and veterinary, claim and counterclaim that it is one and the same disease and vice versa. The confusion arises, in the author's opinion, from the fact that the cat, not only can, but does suffer from human diphtheria, the Löffler bacillus being easily demonstrated in such cases, and it is also an accepted fact that the cat may be a carrier of human diphtheria. Whether or not cat and human diphtheria are identical is of little importance to the clinician, but of the gravest import to the public health officer. Acting on the supposition that the disease may be human diphtheria or that cat diphtheria and human diphtheria may be the same, the infected cat should be given no opportunity of spreading infection.

Symptoms.—The disease is ushered in by general malaise, rigors and suspension of appetite. The temperature is raised, and lassitude is well marked. Saliva dribbles from the mouth, which is often held partially open; breathing is partly oral, somewhat labored and accomplished with a wheezing, bubbling sound.

A discharge, clear and watery at first, later becoming of the color of blood serum, exudes from the nostrils and eyes. Sneezing and coughing occur, the cough being painful and repressed.

Upon examination of the throat it is found somewhat painful to outside pressure and the pharyngeal mucous membrane and that of the soft palate is seen to be congested and covered with a diphtheritic membrane. The mouth emits a foul odor and there is often an offensive diarrhea. The disease develops very rapidly, and the animal soon shows signs of a general toxemia, becoming at first semicomatose, with widely dilated pupils, perfectly indifferent to surroundings, but moaning or crying out if disturbed. In course of time the intoxication becomes more and more profound, the animal finally dying either in deep coma or in convulsions.

Acute cases of diphtheria in cats that terminate fatally run their course in twenty-four hours or less.

Treatment.—At the very onset of the symptoms a full dose of diphtheria antitoxin should be administered hypodermically. One-grain doses of calomel should then be given and the douching of the nose, mouth and pharynx carried out as advised for distemper. The antitoxin may be repeated with advantage in twen-

ty-four hours after the first dose and, if necessary, the dose may be increased with perfect safety.

Tuberculosis

Tuberculosis in the cat is of far more frequent occurrence than is generally supposed and is of importance from a public health standpoint. The disease may be contracted from the ingestion of tuberculosis milk, which is probably the most frequent source of infection, or from association with tuberculous persons. The possibility of a tuberculous cat infecting children must not be overlooked, as cats are nursed and kissed by the little ones, and often sleep in the same bed with them.

Adult cats are the most frequent sufferers, the disease seldom appearing in kittens, although it is possible, as in children, that infection may take place at an early age and remain latent until adult life is reached. The most frequent seat of the primary lesions is the alimentary canal, from which it may spread to every organ in the body.

The acute miliary, pulmonary and pleuritic tuberculosis so often found in cats is nearly always secondary and very seldom of primary origin.

Symptoms.—Gradual but progressive emaciation, the loss of flesh being particularly well marked over the parietal region and along

the back. The eyes become sunken, and if renal tuberculosis is present, amaurotic, or less frequently there is an iritis or choroiditis, and sometimes detachment of the retina.

There is a persistent cough and sometimes mucus is coughed up and expelled, but is usually swallowed and so escapes notice.

There may be intermittent diarrhea unless the enlarged mesenteric glands cause partial obstruction of the intestines, in which case there is constipation. The animal loses strength very rapidly, is incapable of any exertion, exhibiting panting and marked distress if made to move quickly.

If the liver is affected or the tubercular mesenteric glands or masses of deposit in the abdominal cavity cause portal obstruction, abdominal ascites occurs. This often takes the form of chylous ascites, the transuded fluid being milky and containing much fat. It should be noted, however, that chylous ascites is not pathognomonic of tuberculosis as it may occur from anything that causes portal obstruction.

The appetite is variable and is usually suspended towards the end, the temperature is fluctuating, rising to 105° F. and falling again to normal. If the lungs and pleura are attacked the ordinary symptoms of pleuro-pneumonia are present and can be recognized by ordinary diagnostic methods. The parotid

lymphatic glands are often involved, fistulae forming that discharge a sticky fluid that gums the hair in the region of the throat. The skin of the lips, throat, breast and between the paws is often the seat of ulceration that shows no tendency to heal under the most painstaking treatment, but rather to spread and involve more tissues. Wounds show no tendency to heal, but rather to become necrotic.

Diagnosis.—The suspicions aroused by the above symptoms may be confirmed by the tuberculin test and by the discovery of the bacillus of tuberculosis in the bronchial discharge, in the feces or in the thoracic or abdominal fluids.

The dose of tuberculin is from one to five minims, and is administered hypodermically. The temperature should be taken every hour after injection, as the reaction, if it occurs, reaches its height at about the fifth hour. The ophthalmic test is said to be unreliable, but this is contrary to the author's experience. The intradermal test deserves a trial, as there are many cases in which the temperature reaction cannot be applied or relied on. The enlarged mesenteric glands can be palpated easily through the abdominal walls.

Treatment, needless to say, is not justifiable owing to the risk to human beings.

CHAPTER V

EXTERNAL PARASITES AND DISEASES OF THE SKIN

Pediculosis or Lousiness

Cats are very subject to infestations of lice, and more especially so if debilitated from disease or old age. The lice belong to the phylum Arthropoda, natural order Rhynchota, which comprise the two main families, the Hematopinus and the Trichodectes.

The Hematopinus are true bloodsuckers, the Trichodectes surface feeders, puncturing the skin and living on the exuded juices. The cat is more commonly affected by invasions of one of the Trichodectes, viz., the Trichodectes subrostratus, but sometimes harbors a Hematopinus, common also to the dog, the Hematopinus piliferus.

Symptoms.—Both varieties produce a dermatitis, which is increased by the animal's efforts at biting, scratching, and rubbing, in the vain attempt to gain surcease from the continued irritation.

The irritation produced deprives the animal of rest and it becomes debilitated, and in extreme cases emaciated. The hair loses its lustre, is stary, becomes full of dandruff, and falls out in patches. The skin becomes the seat of excoriations and sores from the animal's efforts

at relieving the irritation, becomes thickened, and there is marked desquamation of the epithelium.

On close examination the nits or ova cases are seen clinging to the hairs. The parasites may be found either with their heads burrowed into the skin or moving about over the surface. The favorite locations of the lice are on the head at the base of the ears, under the chin, on the breast, around the shoulders, along the back and at the root of the tail.

If infested with *Hematopinus* well marked anemia is added to the clinical picture, and emaciation and prostration may be extreme, the animal passing into a state of marasmus, often ending in death, if relief is not obtained.

Treatment.—In slight cases where clipping is objected to, the coat should be well brushed, all matted masses of hair removed, and as many of the parasites as is possible removed with a fine comb. An infusion of stavesacre 1 to 20 should then be applied and well worked into the hair and skin. The process should be repeated several times.

In young cats or in cases that are debilitated, chinisol 1/500 may be substituted for the infusion of stavesacre, as there is some slight risk of toxic effects from the latter. Nits can be removed from the hair by the application of vinegar or dilute acetic acid.

In all cases the premises should undergo a complete disinfection. To counteract the debility and anemia a full and generous diet and a course of hematinics should be prescribed.

In addition to its importance as a skin parasite, the *Trichodectes* is, as has been before mentioned, the intermediate host of the *Dipylidium felis*, so that its eradication is of double significance.

Fleas

The fleas belong to the natural order Siphonaptera, of which the *Ctenocephalus felis* is the flea peculiar to the cat. The *Pulex irritans* or the flea infesting man, and the *Ctenocephalus canis*, or the dog flea, are also found at times infesting the cat.

Clinically, all fleas produce the same results, viz., irritation and dermatitis and have a harmful effect on the condition of the animal by interfering with its rest. At the same time, fleas do not produce such bad effects as lice except very occasionally, when the same symptoms as described for lice are noticed.

Treatment.—The same treatment as advised for lice is effectual, or the animal may be dusted well with pyrethrum powder and rolled up in a towel for ten minutes and then well brushed. Spirits of camphor sprinkled on a rough towel in which the cat is rolled is a very cleanly and efficacious way of destroying fleas.

The fleas migrate to the towel, becoming stupefied, and the towel is then plunged into boiling water. This method is recommended for long-haired cats, or cats requiring treatment just previous to a show, as the gloss of the coat is not interfered with.

The *Ctenocephalus felis* passes the whole of its life history on the cat, thus differing from the *C. canis* and *P. irritans*, which pass their larval stages away from their host, in cracks and crannies in the floor, walls, etc., of the kennel or living quarters.

Mange

The cat suffers from two forms of mange: (1) Notoedric; (2) Otodectic. The parasite causing Notoedric mange is the *Notoedres minor felis cati* (formerly known as the *Sarcoptes minor cati*). It belongs to the natural order Acarina, Family, Sarcoptidae.

The *Notoedres* differ from the *Sarcoptes scabiei* in that the body is smaller, somewhat more circular, the dorsal spines being replaced by concentric rings, and the fact that the anus is dorsal instead of being terminal. In common with the *sarcoptes*, the ambulacra terminate in suckers mounted on unjointed pedicles, which leave the ambulacra at an angle. Both are burrowing mites. The above description is given, since a positive diagnosis of mange can

be made only upon the discovery and recognition of the parasite.

In order to determine the presence of the parasite it is necessary to get a deep scraping of the skin. This can be done by first of all removing superficial scales and debris and then with a blunt knife scraping the skin until blood oozes. The material thus obtained is now boiled for ten minutes in a ten per cent solution of potassium hydroxid and allowed to settle or is centrifuged. The supernatant fluid is decanted off and the residue transferred to slides and examined microscopically under low magnification.

Symptoms.—The symptoms are essentially those of a dermatitis, manifested by irritation, reddening and thickening of the skin, desquamation of epithelium and loss of hair. The pruritis is intense and the animal inflicts considerable damage to the skin by its persistent rubbing and scratching.

In an advanced case the primary skin lesions are entirely masked by those resulting from self-inflicted injuries, but if seen in the early stages the skin is seen to be covered with little red papules, somewhat like flea bites; these exude a drop of serum and the hairs become matted together. Later patches of skin become bald, covered with scales and very much thickened. Desquamation and piling up of the

epithelium are very characteristic of mange in the cat, the skin becoming wrinkled and covered with a thick coating of scabs. The persistent and intense pruritis gives the animal no rest, and it gradually loses in condition, becoming debilitated and sometimes marasmic.

Treatment.—Treatment is difficult and in advanced cases none too satisfactory, especially as the predilection seat of the parasite is the face, nose, lips, around the eyes, chest, legs and claws. From these regions it may, of course, involve the whole body. The hair should be clipped and the scabs removed, as far as possible, by washing with an alkaline solution and soft soap. A five per cent ointment of salicylic acid should then be rubbed in very thoroughly to remove the epithelium, followed by daily inunctions of sulphur ointment, a useful combination being sulphur 1, potassium carbonate $\frac{1}{2}$, lanolin 4.

Around the eyes and on the eyelids chinosol solution, $\frac{1}{500}$, or balsam of Peru, one part, lanolin eight parts, may be used. The inunctions should be repeated every three days and the treatment persisted in until the growth of new hair shows the disease to be controlled. It is often an advantage in protracted cases to change the applications occasionally from oily dressings to watery, and vice versa.

Otodectic Mange or Ear Mange

The parasite causing ear mange is the *Otodectes cynotis felis (cati)* and belongs to the Sarcoptidæ, being closely related to the other members of the same family, i. e., the choriop-tes, differing from it only by the disposition of the ambulacral suckers.

A brief description may be of use and interest. All legs are marginal, male with bilobed extremity to abdomen, copulatory suckers, ambulacral suckers; in the female, on the first and second pair, on the first, second, and third, pair of legs in the male. The ambulacral suckers are almost sessile, the pedicle being very short. The parasite is considerably larger than the *Notoedres* and is visible to the naked eye, being easily seen moving about in the debris of the external auditory canal. The predilection seat of this parasite is the ear flap, the external auditory meatus and external auditory canal. It does not wander from these locations.

Symptoms.—The irritation due to the invasion of the parasites sets up an otorrhea of the external auditory canal, manifested by the discharge of a dark colored and offensive exudate, pruritis, ulceration of the ear flap and auditory canal, and the formation of granulation tissue. The patient is continually shaking its head, scratching at the affected ear, or rub-

bing it along the ground. Manipulation is painful and is resented. Upon examination, the ear flap is seen to be soiled with a dark colored discharge, which collects in the convolutions of the concha, and which issues from the external auditory canal. If looked for carefully, the parasite can usually be seen as a minute speck moving among the debris. In advanced cases the ear flap, meatus and canal may be the seat of ulcerations, in which cases the parts are exceedingly tender, and the discharge is more offensive. In other cases granulations block up the canal and meatus so that an inspection of the interior is impossible. In long-standing and neglected cases, infection may extend to the middle ear and to the meninges, when symptoms of cerebral mischief will develop.

Treatment.—The preliminary step is a complete clean-up of the whole external auditory apparatus, and this is best accomplished by filling the ear with hydrogen peroxid to loosen up accumulations of wax and discharge, followed by the use of a cotton wool swab. After the ear has been freed from all filth it should be well dried and the following lotion poured into the canal and smeared all over the ear flap, taking care to reach all crevices: Beta naphthol dram 1, ether drams 3, olive oil drams 2. The meatus should be plugged with a piece of wool

immediately the lotion is poured in to prevent the too rapid evaporation of the ether. The applications should be made daily for three days, when the ear should again be thoroughly cleaned out and filled with an antiseptic dusting powder, such as formidine, chinol and boric acid, one in three; methyl-ditannin, bismuth, formic iodid, etc.

If granulations are present, attempts may be made to reduce them by the application of silver nitrate or they may be removed with scissors or scalpel under anesthesia. There is no successful treatment, if cerebral symptoms develop.

Hematoma of the ear flap is a common complication, but its treatment in no way differs from that of the same condition in the dog.

Dermatomycosis

The dermatomyces affecting the cat are *Trichophyton*, *Microsporon*, and *Achorion*, the first two named causing ringworm, the latter favus.

Trichophytosis and *microsporiasis* in no way differ in type from the ringworms affecting other animals. Favus is more particularly peculiar to the cat and therefore it alone will be considered here.

The fungi responsible for the condition are the *Achorion quinckeanum* and *Achorion*

Schönleinii. The parts commonly affected are the paws, head, forehead, ears, and lips.

Symptoms.—On the parts affected, circular raised patches covered with yellow crusts and varying in size from that of a pin head to that of a five-cent piece, are observed. As the crusts grow older they become gray in color and more powdery. If the crusts are removed, a cup-like depression is seen, the marginal skin being inflamed and indurated.

The lesions spread from the periphery, the hair being destroyed and circular bald patches remain. The lesions under the crusts are at first moist with serum, but this soon dries up, leaving the patch covered with powdery scales. Irritation is not very marked, and there are no constitutional disturbances. The fact that favus is transmissible to the human being should not be lost sight of and the proper precautions must be taken to prevent the spread of the disease.

Treatment.—The hair should be clipped off the affected parts and burned immediately. The crusts should be removed by soaking with a strong solution of carbonate of soda and scraping, and the parts painted with tincture of iodine, a five per cent solution of silver nitrate, or given an inunction of iodine ointment well rubbed in.

The disease is sometimes very obstinate and the treatment should be given daily until a cure is effected. In all cases the antiseptic used should be applied to the surrounding parts around the periphery of the lesions and not only to the lesions themselves.

