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PARASITIC
DISEASES OF THE SKIN

WITH ILLUSTRATIONS

JAMES STARTIN

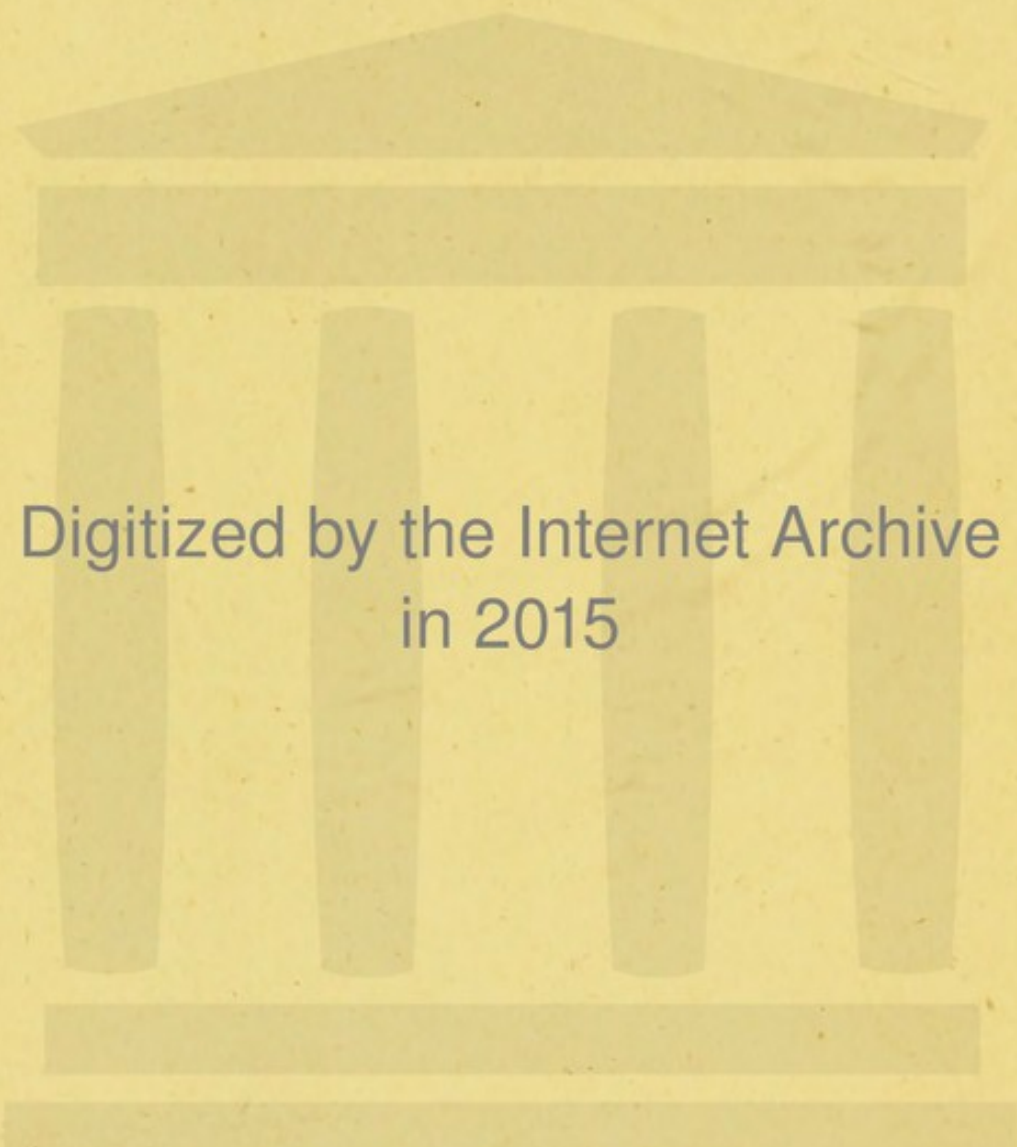
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LECTURES
ON
THE PARASITIC DISEASES OF THE SKIN.



With the Author's Compliment.

LECTURES
ON THE
PARASITIC DISEASES OF THE SKIN
VEGETOID AND ANIMAL

BY

JAMES STARTIN

SURGEON AND JOINT LECTURER TO ST. JOHN'S HOSPITAL FOR DISEASES
OF THE SKIN, LEICESTER SQUARE, LONDON.

WITH ILLUSTRATIONS

LONDON

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PREFACE.

I HAVE been induced to publish these Lectures (delivered in 1878-9) on the Vegetoid and Animal Parasitic Diseases of the Skin, (with Illustrations of the principal parasites) in the hope that they may prove of value to the practitioner and the student in the diagnosis and treatment of these somewhat common, yet troublesome diseases—for a very large proportion of cutaneous diseases that come under our notice in England are due to the influence of parasitic fungi. And particularly, as at the present time so much controversy is going on amongst scientific medical men as to the nature and character of these parasites, and their successful treatment, viz., so-called ringworm and others. A few remarks upon the common character of the parasitic fungus will, I think, be not out of place here.

These vegetoid parasites, (vegetoid, for we are not quite satisfied that it is a true vegetable as yet) by reason of the absence of chlorophyl, are not able to

produce constituents necessary to their growth out of inorganic material; viz., they are dependent on organic substances for their life.

Morphologically—fungi commonly, as in mould, consist of mycelial threads, single or branched, which form the principal vegetable part of the fungus (the mycelium or thallus). There is also in addition a fructifying part, subject to great variations, with sexual organs, the essential means of distinction between the various fungi, the Spores and Sterigmataë, the Basidia or branched arms, from the fruit-bearing Hypa, and the Thallus or Mycelium.

Polymorphism is now demonstrated beyond doubt to occur amongst these vegetoid parasites. This accounts for the fact that one and the same parasite does not choose a different situation, or develop a different variety to that of its parent, although there is such a close relationship between some of them, as in the case of ringworm and favus; and the secretions of the skin excited by the parasite into a process of fermentation in certain conditions of ill-health and nerve derangement are the principal pabulum of the fungus.

It is after careful consideration I have adopted the nomenclature and classification of these parasitic diseases hereinafter mentioned. The literal translation of the words at present in use, viz., tinea and ringworm, has a totally different signification to that of a fungus parasite.

I hope, ere long, to bring before the profession a still more complete description of these parasites in my work on the Skin, now in preparation.

16 Sackville Street, Piccadilly, W. London.

June, 1881.

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DESCRIPTION OF PLATE I.

Illustrations of Vegetoid Parasites of the Skin and Hair.

DERMATOPHYTA.

Fig. 1. *Epiphyton Tonsurans*, common (so-called) ringworm.

- a. Portion of the hair from the head of a child suffering from ringworm $\times 150$ diam.

(STARTIN).

Parasite—*Trichophyton Tonsurans*.

- b. Sporules and fragments of mycelial tubes treated with liq. potassæ, and glycerine $\times 1200$ diam.

(BRISTOWE).

Fig. 2. *Epiphyton Sycosis*, Parasitic Sycosis.

A portion of hair of beard showing the bulb affected with the Parasite—*Microsporon Mentagrophytes* $\times 750$.

(NAYLOR).

FIG. 1.

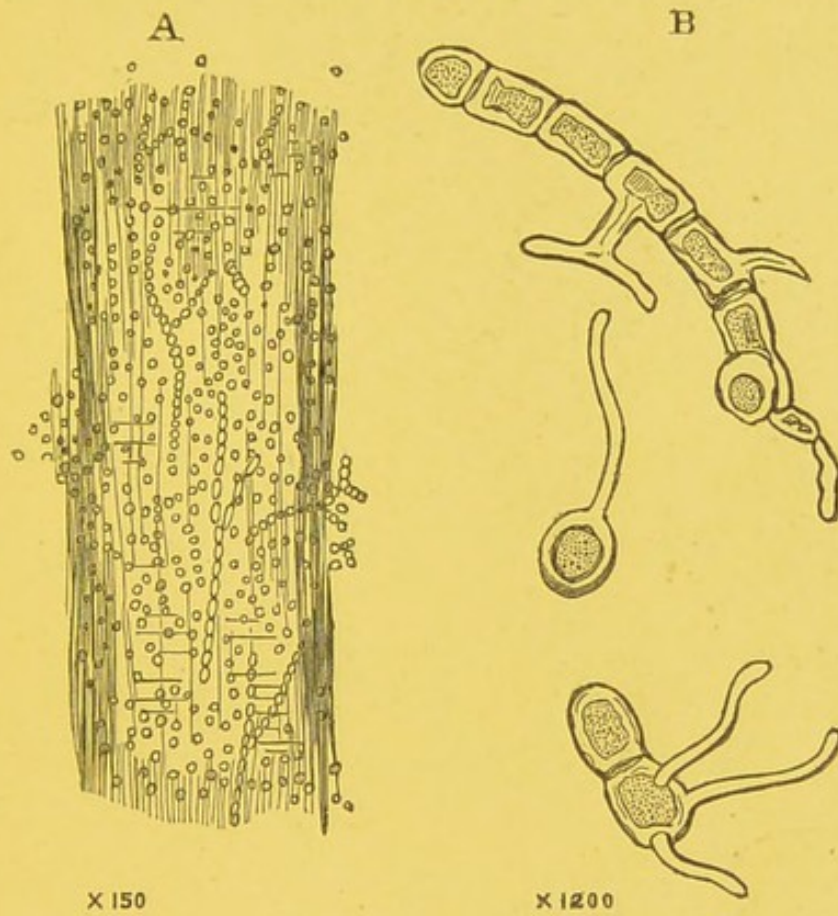
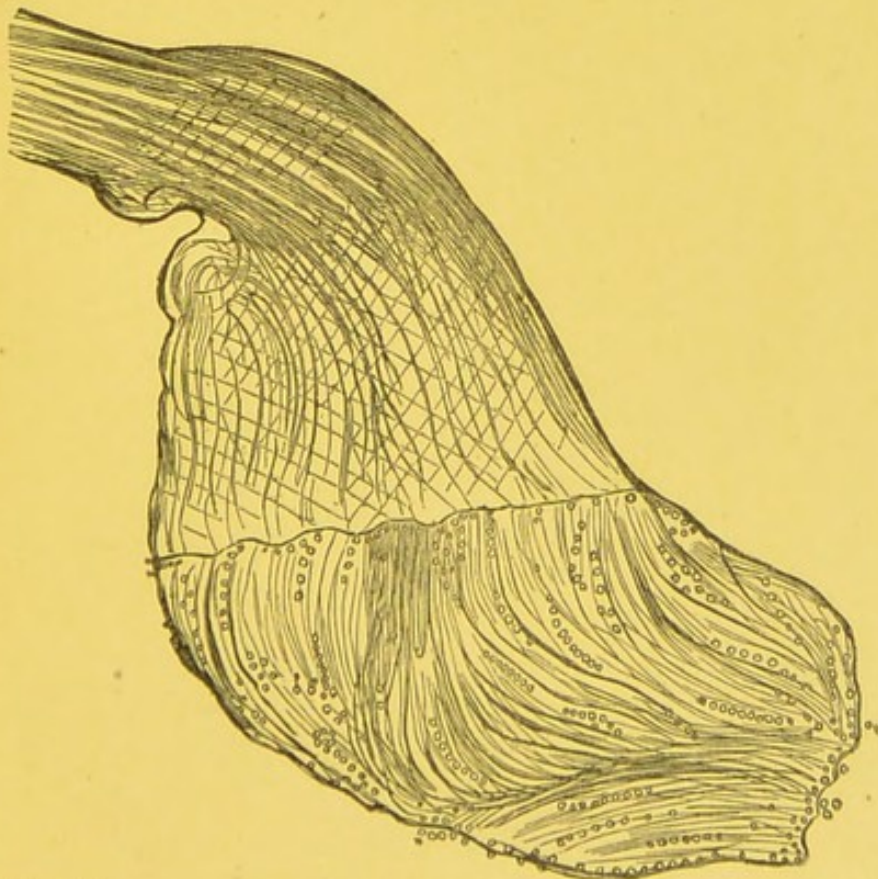


FIG. 2.







DESCRIPTION OF PLATE II.

Illustrations of Vegetoid Parasites of the Skin and Hair.

Fig. 1. *Epiphyton Favosum*—Favus.

- a. A portion of hair affected with Favus.

(STARTIN).

Parasite—Achorion Schænleinii.

- b. Mycelium and spores from Favus $\times 900$ diam.

(BRISTOWE).

- c. Mycelium from epidermis in neighbourhood of Favus cup.
 $\times 600$ diam.

(BRISTOWE).

Fig. 2. *Epiphyton versicolor* (cloasma).

- a. A patch of epidermis of chest showing mycelium and clusters
of spores $\times 600$ diam.

- b. Sporules springing from one another, and from mycelial
cells, some may be seen attached to the latter by stalks
 $\times 1200$ diam.

Parasite—Microsporon Furfur.

(BRISTOWE).

FIG. 1.

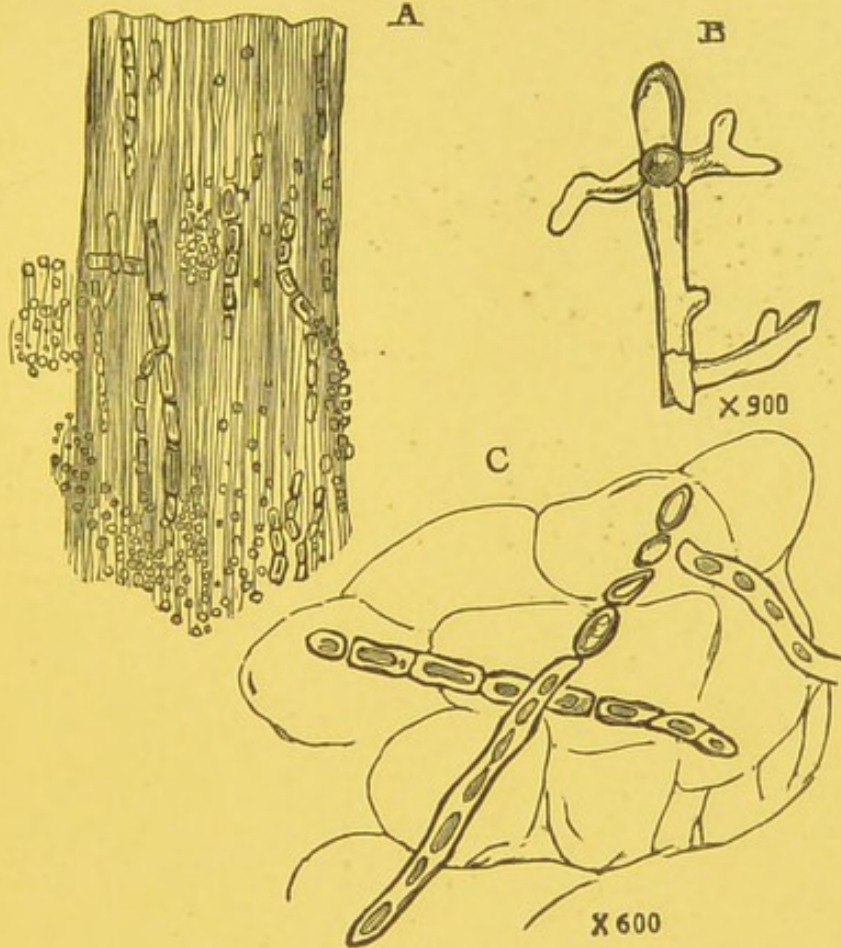
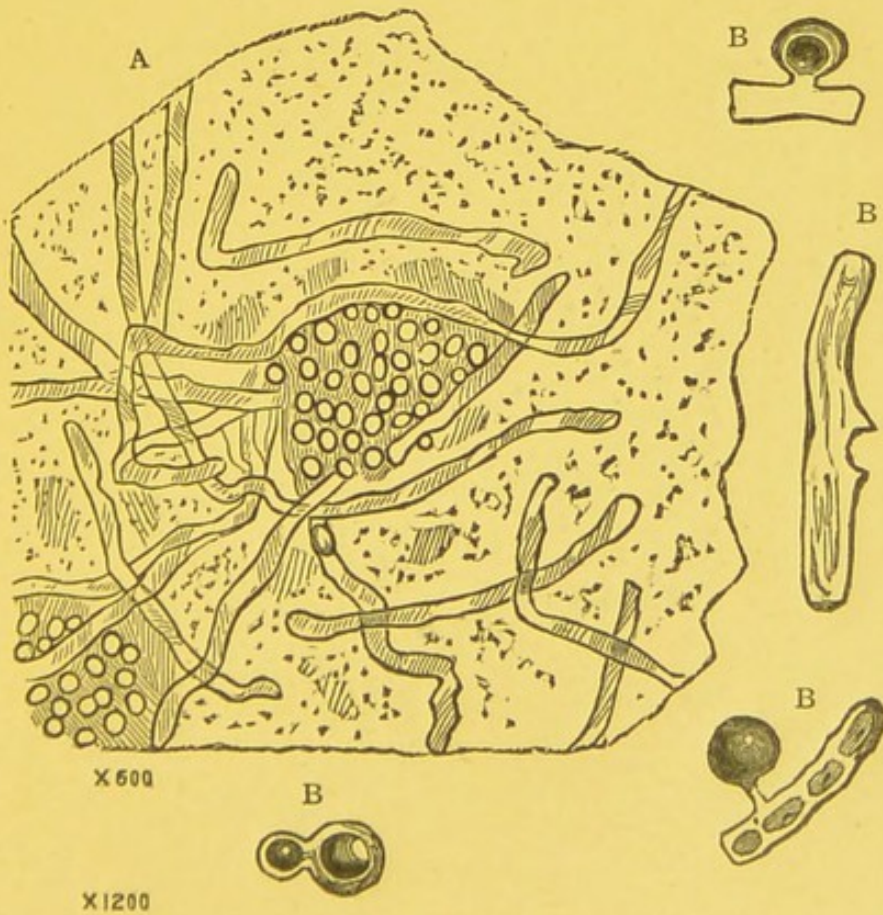
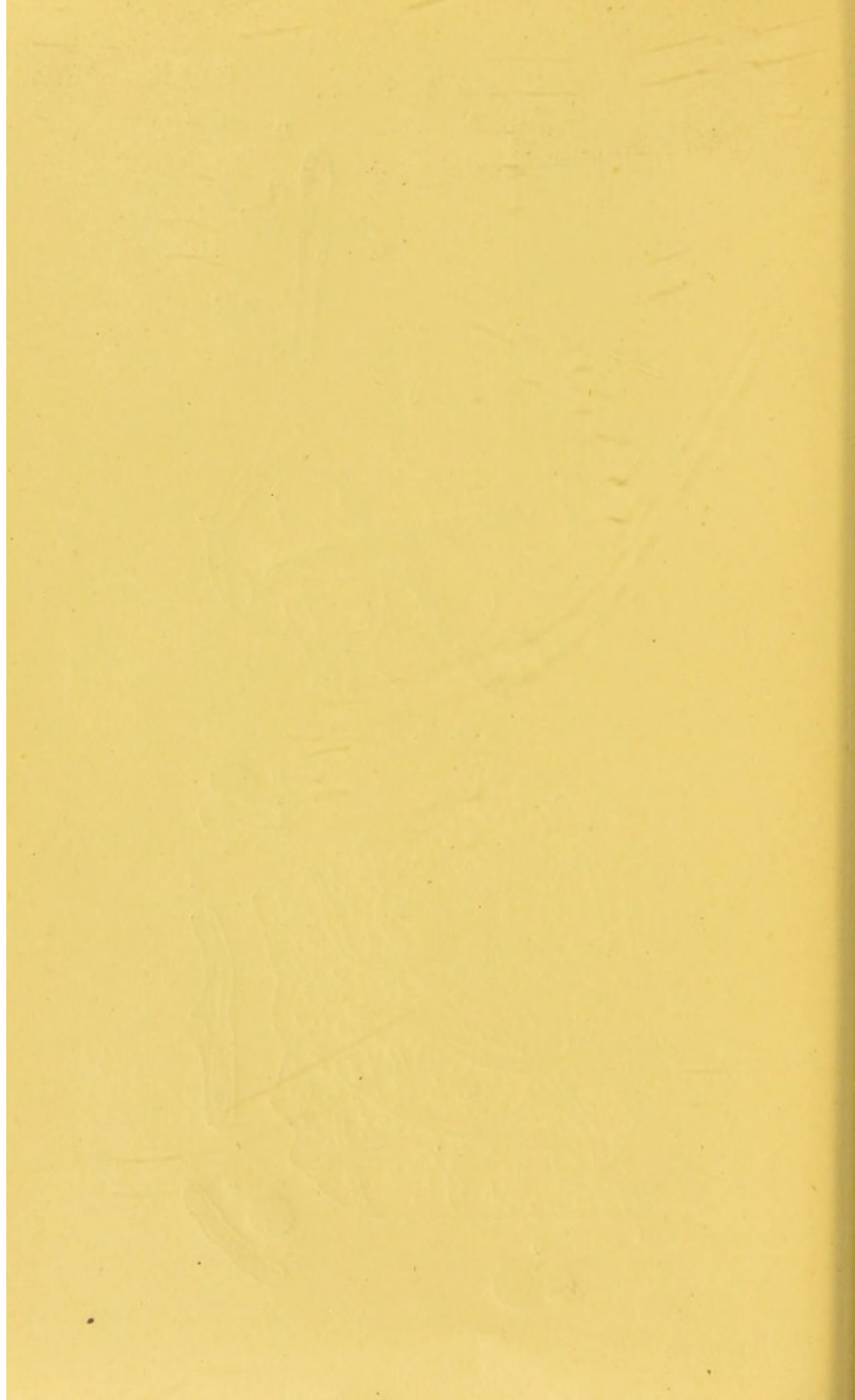
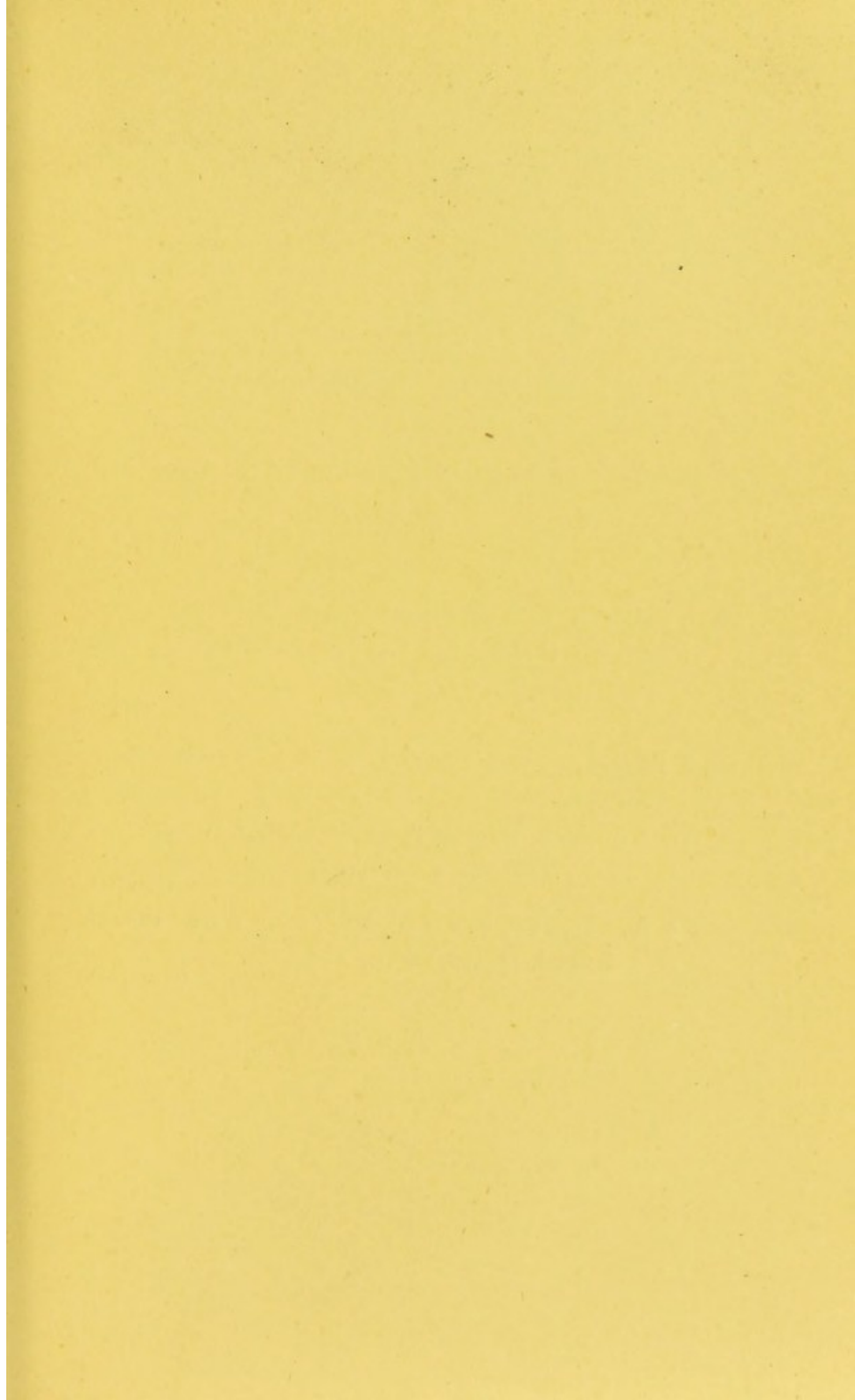


FIG. 2.







DESCRIPTION OF PLATE III.

Illustrations of Vegetoid Parasites of the Skin and Hair.

Fig. 1. *Epiphyton decalvans*—Parasitic alopecia.

A portion of hair of head near root affected with the Parasite—*Microsporon Audouini*.

(BAZIN).

Fig. 2. *Epiphyton Tropica*—Tropical, so-called ringworm, sym. *eczema marginatum*.

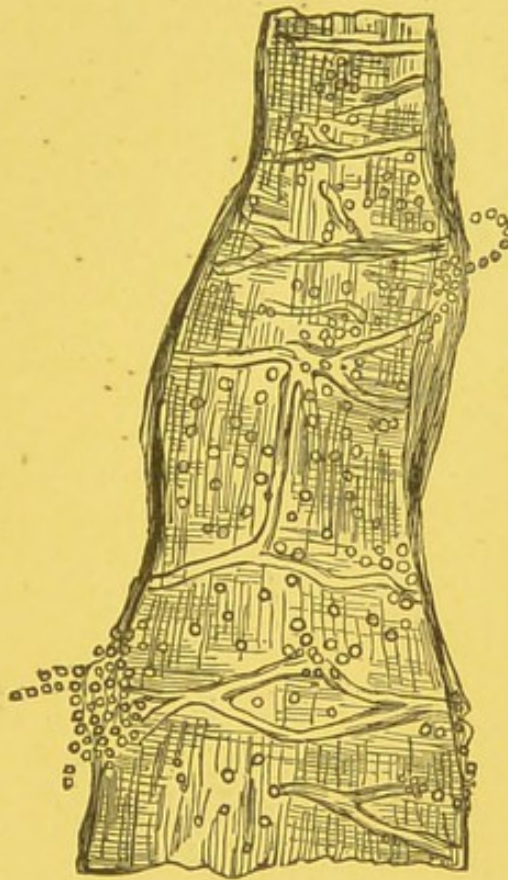
a. A portion of epidermis showing the parasite scraped from a patch of the disease $\times 300$ diam.

(STARTIN).

b. Spores and mycelium of the same parasite $\times 400$. Parasite—*Trichophyton marginatum*.

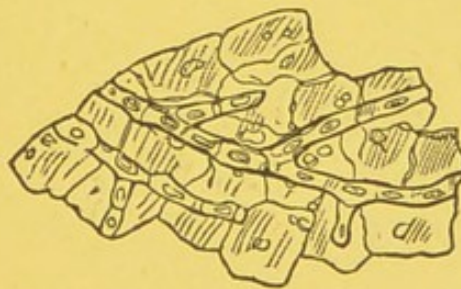
(ANDERSON).

FIG. 1.

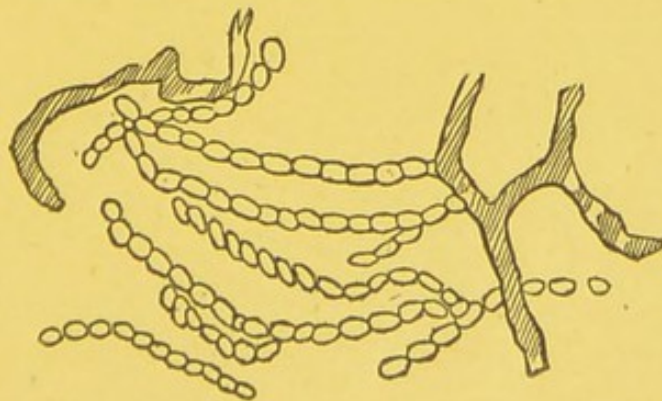


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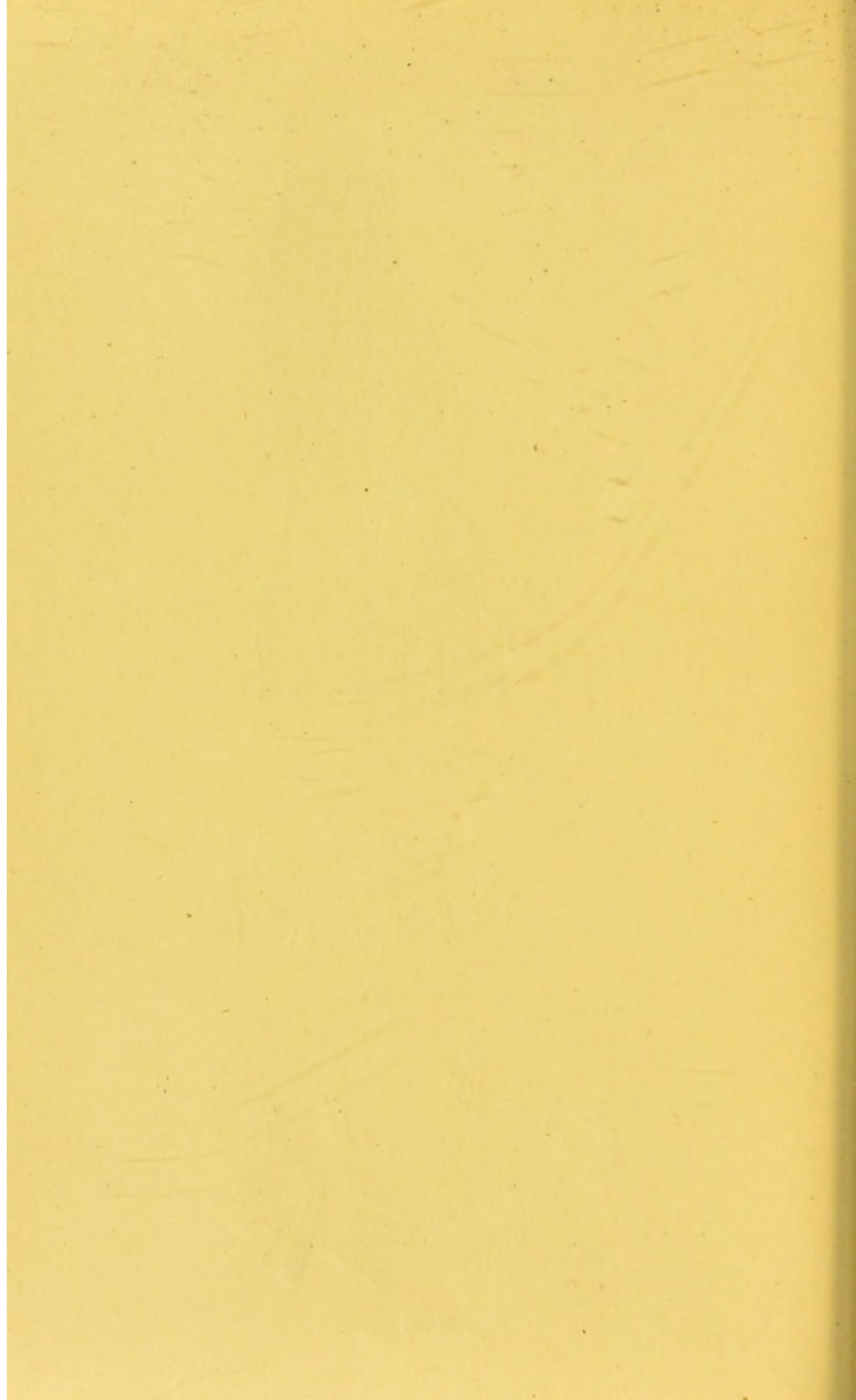
FIG. 2.

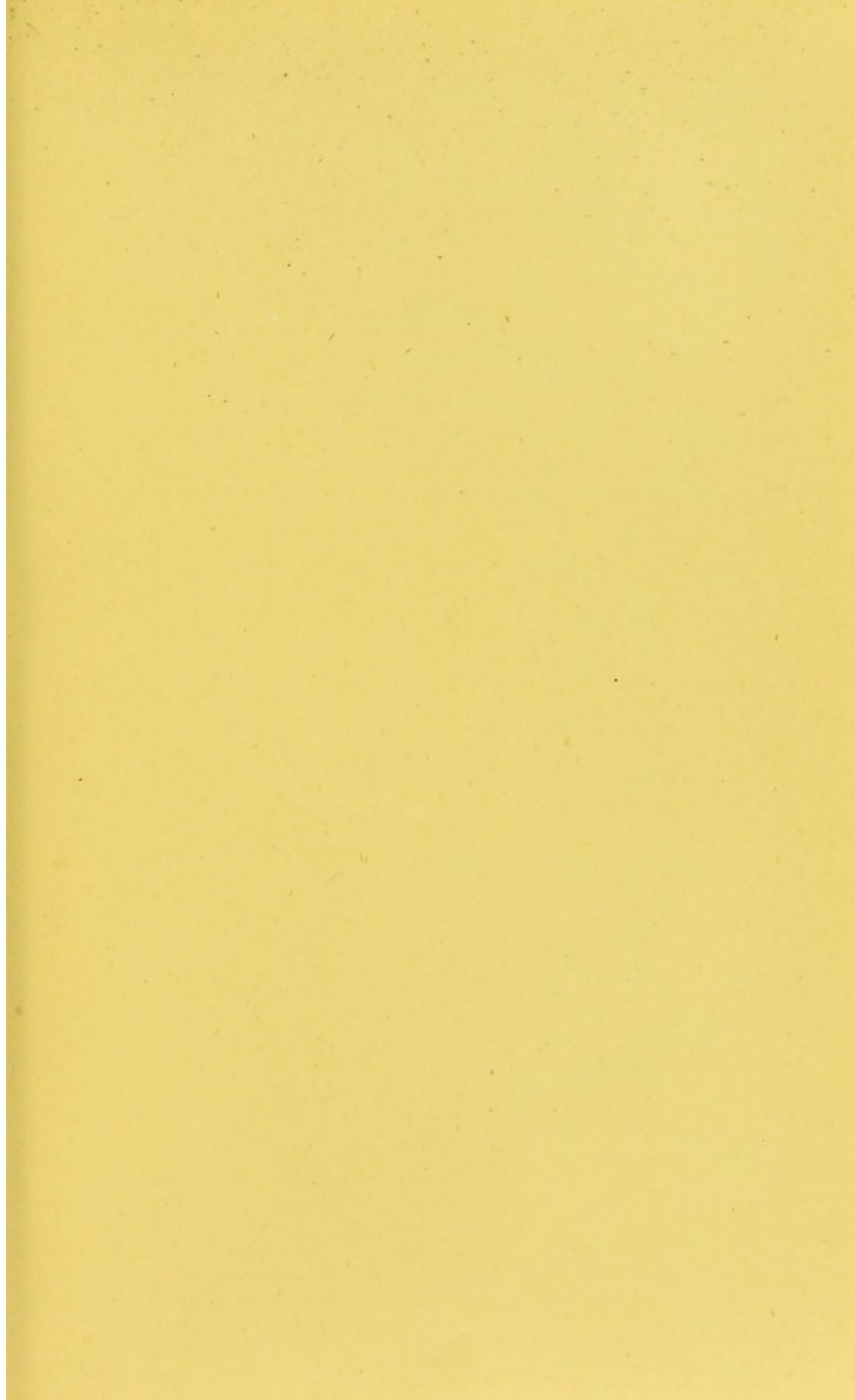


X300



X400





DESCRIPTION OF PLATE IV.

*Illustrations of the Animal Parasites of the Skin and
Hair.*

DERMATOZOA, OR THOSE PARASITES WHICH LIVE IN
THE SUBSTANCE OF THE SKIN.

Fig. 1. *Acarus Scabei* —mature male itch insect (ventral aspect).

(STARTIN).

Fig. 2. *Scabies* burrow with view of female insect and her eggs.

(NEWMAN).

FIG. 2.

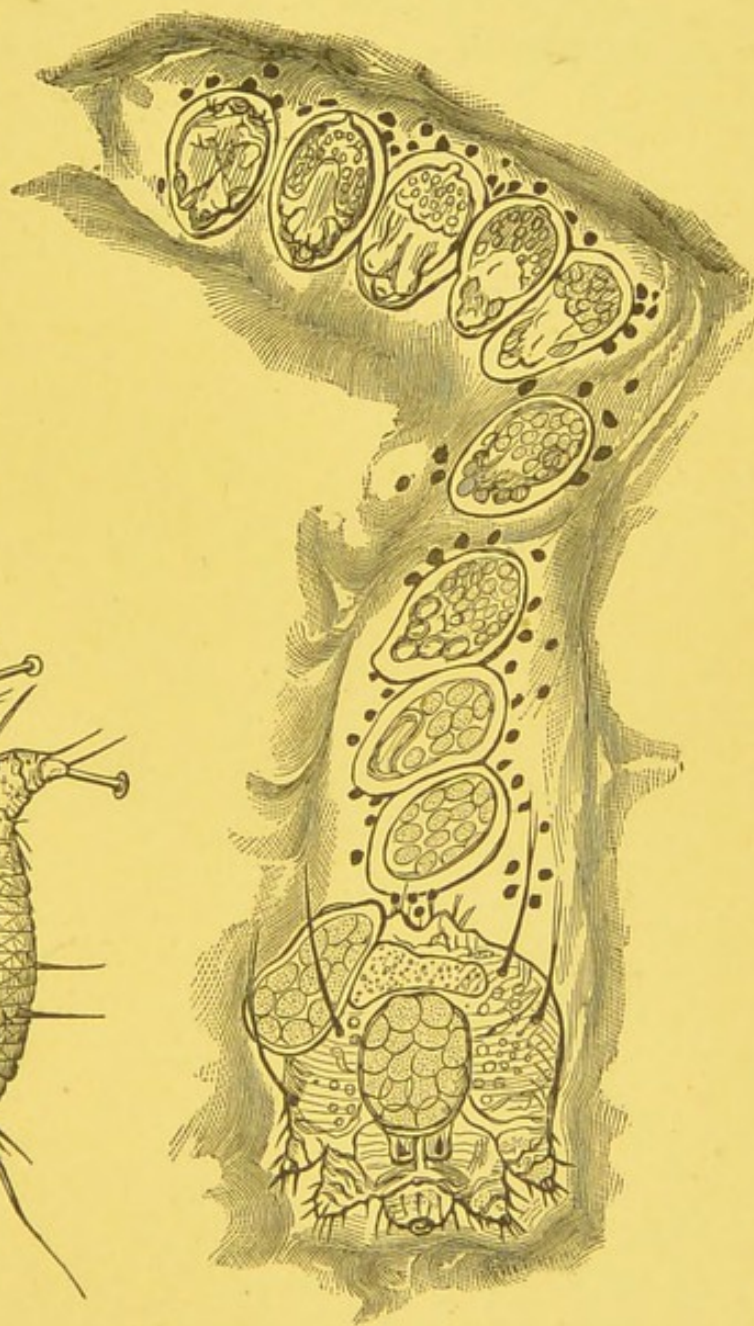
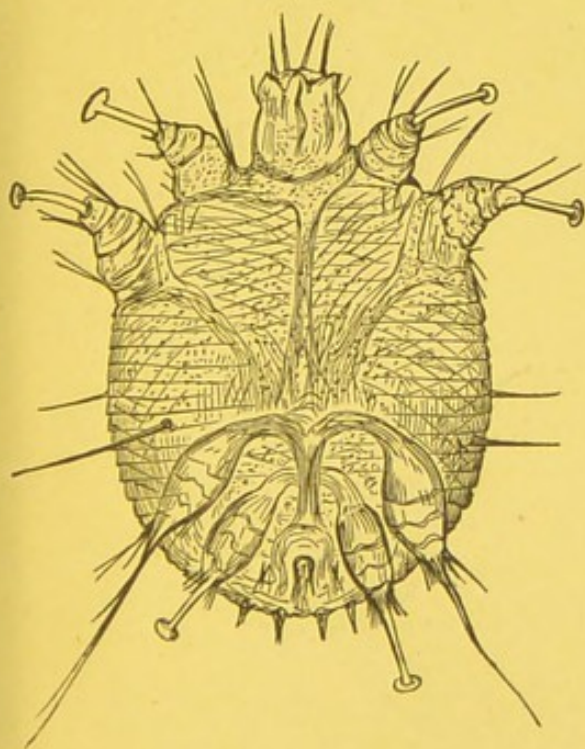
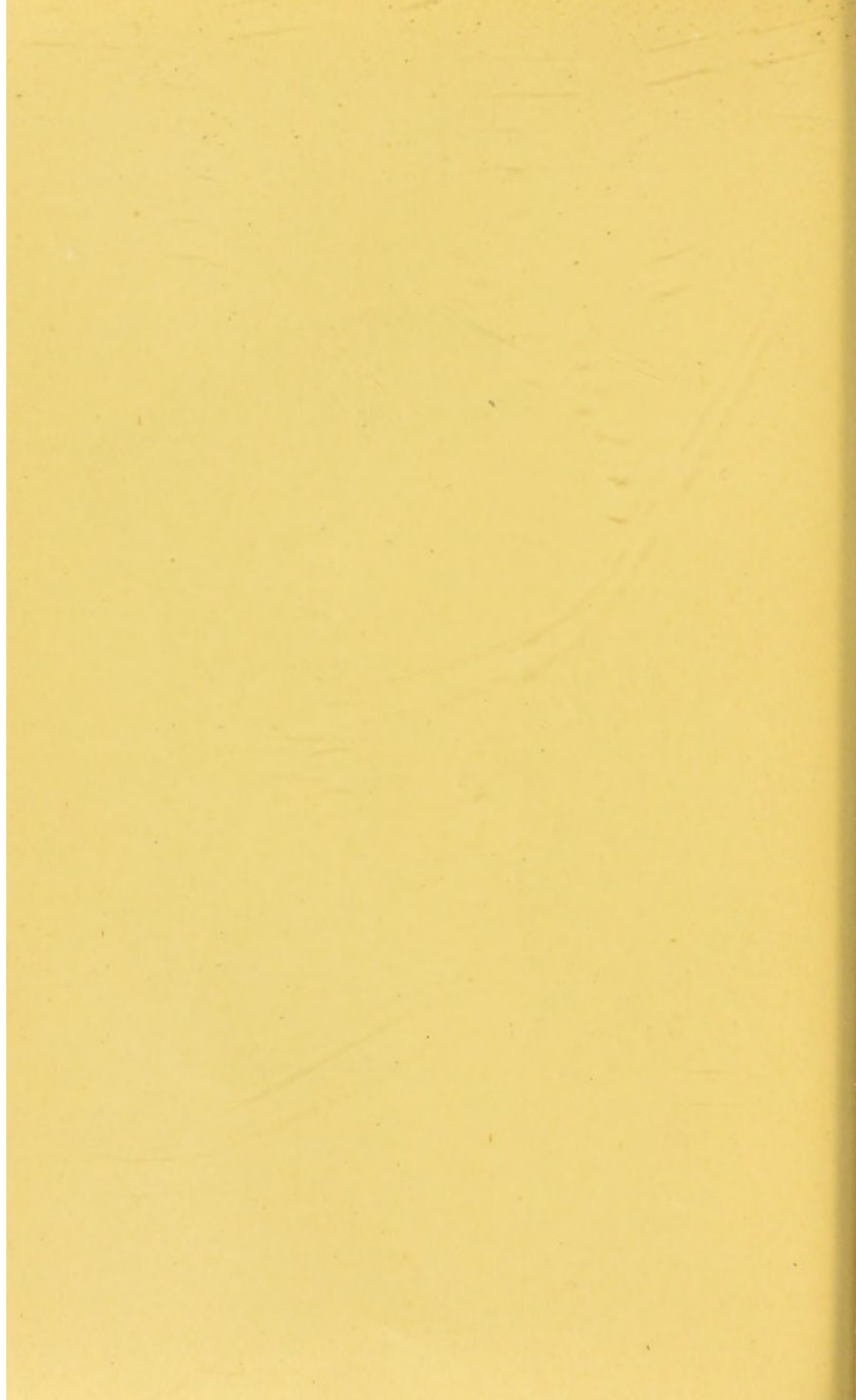
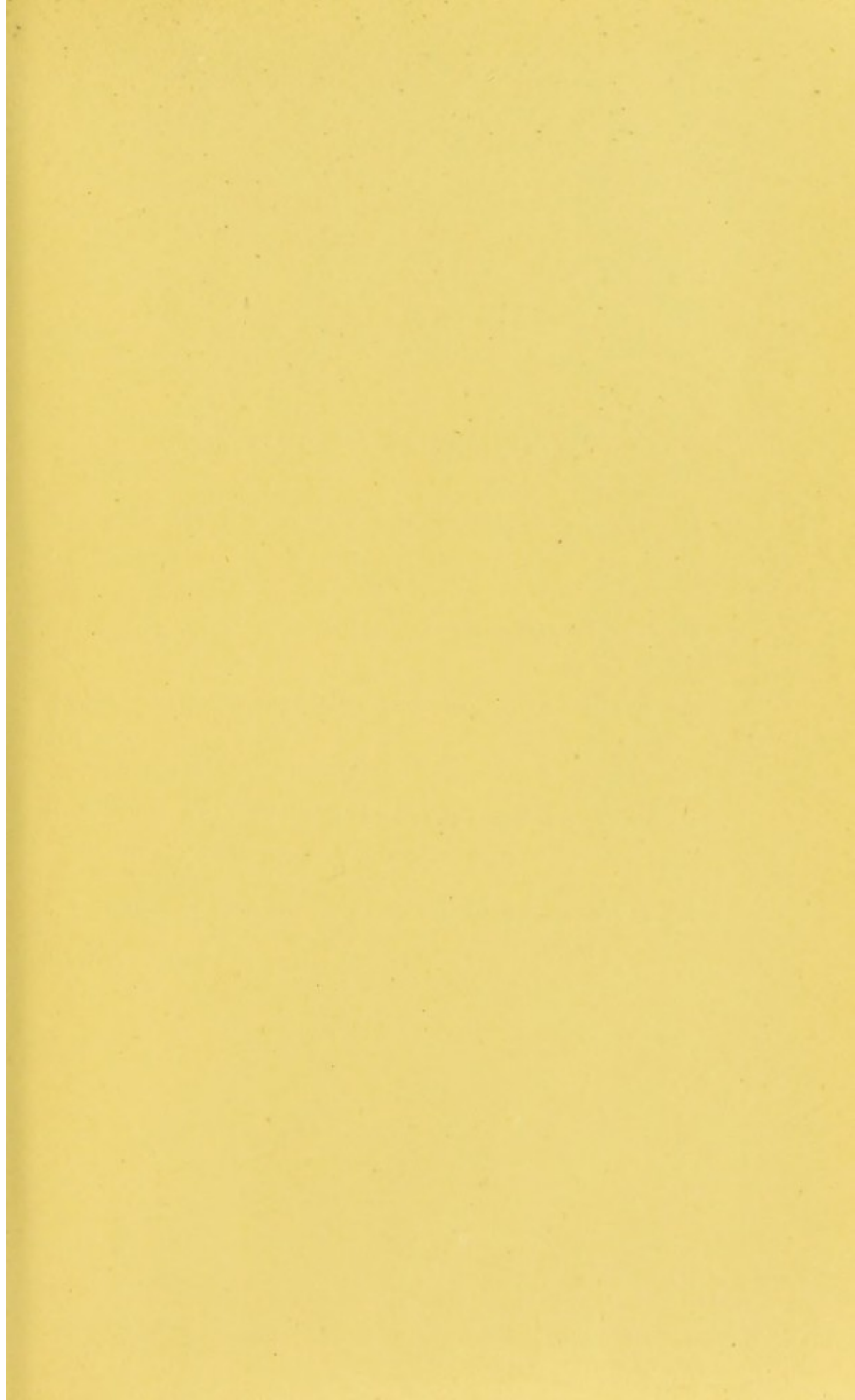


FIG. 1.







DESCRIPTION OF PLATE V.

Illustrations of the Animal Parasites of the Skin and Hair.

Fig. 1. *Leptus Autumnalis*—harvest bug.

(KUCHENMEISTER).

Fig. 2. *Acarus folliculorum*—fully matured pimple mite (dorsal view).

(STARTIN).

ENTOZOA, OR THOSE ANIMALS THAT LIVE UPON THE SURFACE OF THE SKIN.

Fig. 3. *Pediculus capitis*—full-grown common head louse attached to
hair.

(NAYLOR).

FIG. 1.

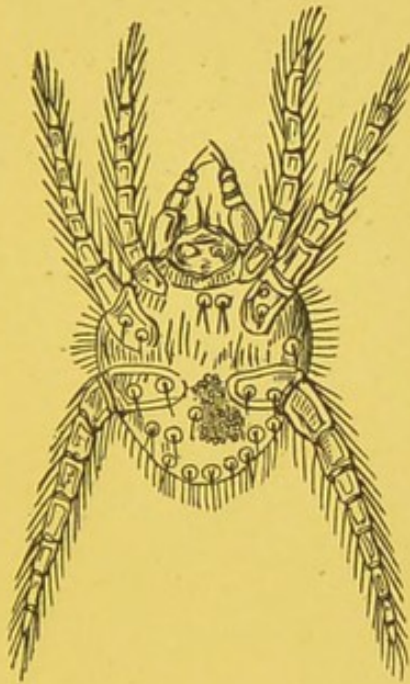
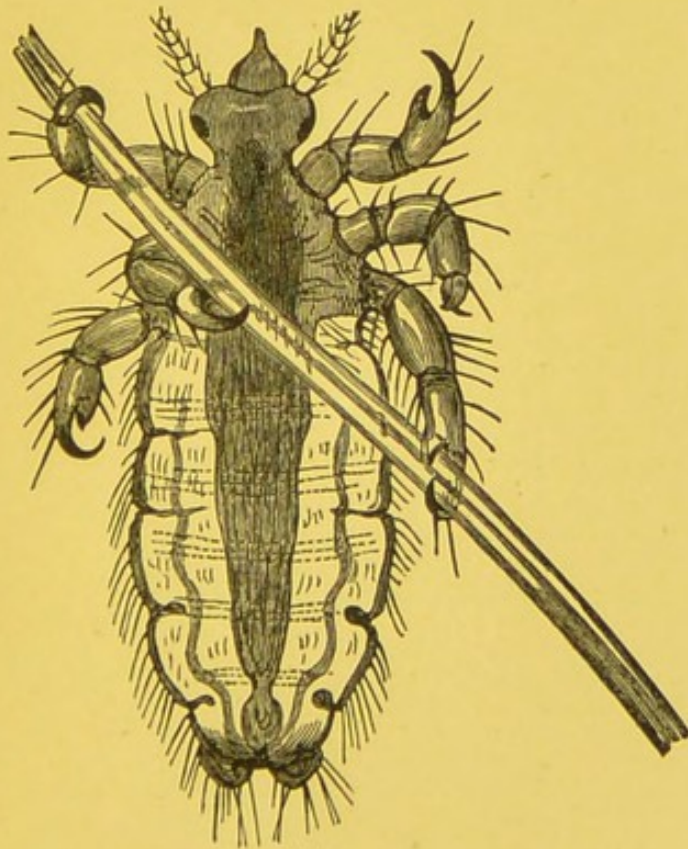
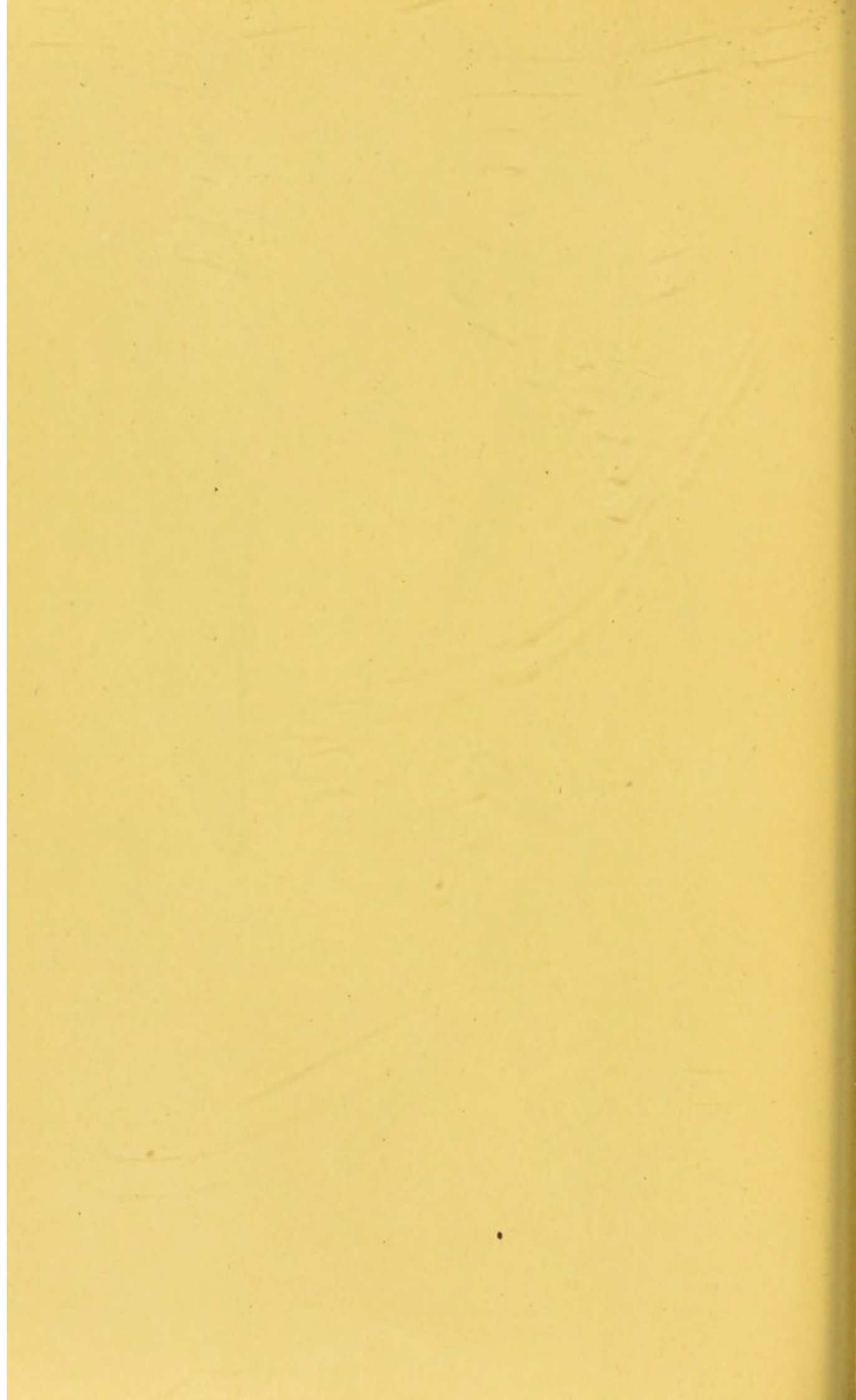


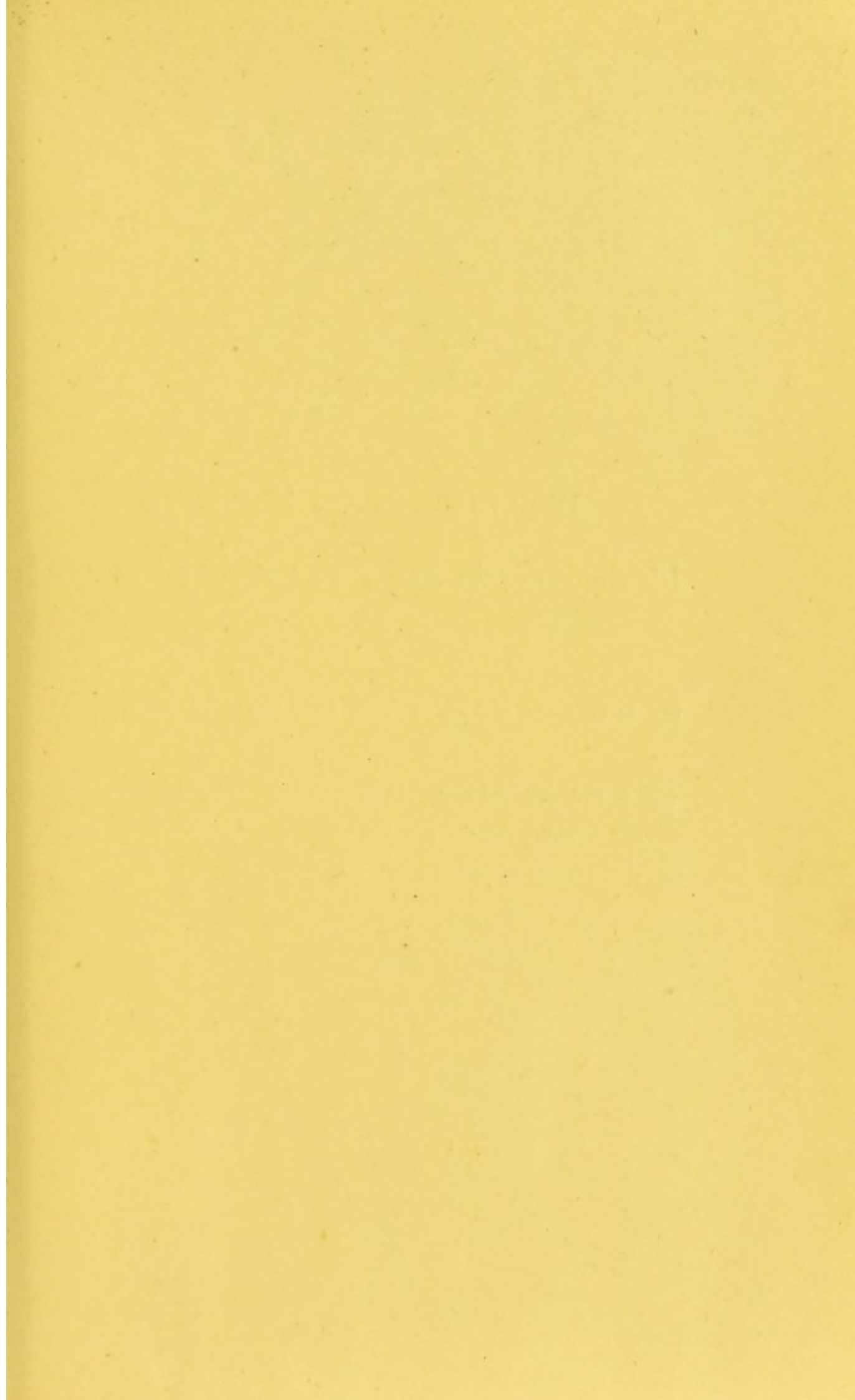
FIG. 2.



FIG. 3.







DESCRIPTION OF PLATE VI.

*Illustrations of the Animal Parasites of the Skin and
Hair.*

Fig. 1. *Pediculus corporis*—common body louse.

(STARTIN).

Fig. 2. *Pediculus pubis*—pubic or crab louse attached to hair, upon
which also are seen the ova.

(NAYLOR).

FIG. 1.

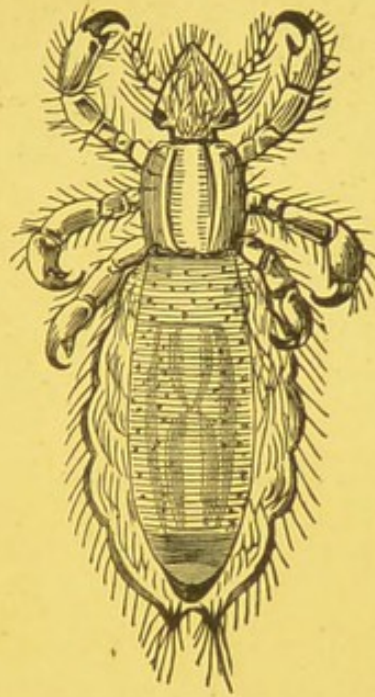
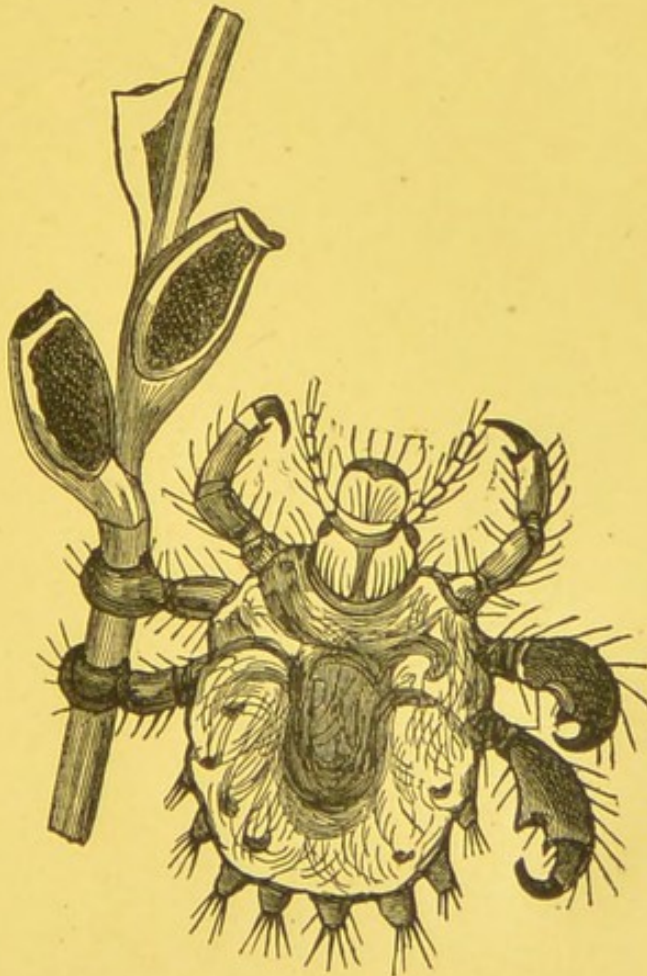


FIG. 2.





THE DERMATOPHYTA

OR

VEGETOID PARASITIC DISEASES OF THE SKIN

LECTURE I.

VEGETOID PARASITES.

Introduction.—History.—Aids to Discovery.—General Character.—

Diagnosis.—Structure.—Mode of Transmission and Pathology.

THE subject I have chosen, and have the honour to put before you in this lecture, is that class of skin diseases called Parasitic, due to the presence of vegetoid parasites. The researches of scientific men in Germany, France, America and Italy of late years have greatly advanced in this branch of cutaneous medical science, for the reason that there has been up to the present time much more opportunity offered to those desirous of devoting themselves to the study of this speciality, as is evident in the establishment of their large special hospitals and pro-

fessorships—viz., those of Vienna with the Hebras and Kaposi, and the magnificent Hôpital St. Louis at Paris with Vidall and others, and New York with Duh-ring, Taylor and Bulkley, and at St. John's Hospital we have clinical lectures and demonstrations on cutaneous diseases open to the profession.

Much controversy has arisen for some years past in the medical press and elsewhere with reference to and against special study, special hospitals and dispensaries; and it is a known fact that those individuals who cry out loudest against specialities, the majority of them make exceptions in one or two instances, as in the eye, stone in the bladder, throat, &c., and which, according to them, ought to be treated in special institutions. It appears to me, if I may be allowed to express an opinion, that while every medical man should have a well-grounded knowledge of his profession, he may devote his spare time to one particular branch, by which means his interest in his profession must be very greatly increased; and I think if we look around us, we see that those men who have devoted themselves to one study have become the most successful—not only

so, but by doing this they assist more in the alleviation of the sufferings of the afflicted, and call forth far more applause and gratitude from their fellow-creatures than by paying an equal and sometimes cursory attention to all the varied phases of disease to which mankind are liable; and the *skin ought to have its special interest* to us for this reason, that there is no portion or organ of the human frame that exhibits so many and various pathological processes and changes as the cutaneous surface of our bodies.

I cannot enter with greater pleasure than upon this most important branch of cutaneous medicine and diseases—viz., the Parasitic, which, for the most part, if not all, are contagious, and are due to the presence of vegetoid parasites; and I consider it to be one, if not the most interesting, of the whole genera of cutaneous affections, and I think you must agree with me that these diseases are often the most troublesome to cope with and to cure. It is a somewhat extensive subject to enter upon, and I wish in these lectures not to devote too much time to theory, but to the more important and practical

part, the therapeutics, as applied to these diseases, the result of clinical investigation, which has been my great pleasure, for a few years at my old school, St. Thomas's, the Skin Hospital at Blackfriars, and at our hospital here—St. John's—where I am glad to say we have very good opportunities of cutaneous study.

Our attention has been more especially directed lately to the presence and influence of epiphyta or fungi of a low type upon the skin in the production of these diseases, and a number of facts have been now discovered that undoubtedly prove that they call into action certain evident affections of the skin; there seems to be rather a tendency to underrate their importance, and to assign various other morbid conditions of the cutaneous surface to these manifestations; and there are still, and will be, many points of controversy with reference to these parasites and the diseases which accompany them. I only hope I may be able to add some few facts to the more clear understanding of the microscopic nature and character of these diseases.

History.—More than a quarter of a century ago

Professor Owen first pointed out the vegetoid nature of a diseased growth found in the lungs of a flamingo he was dissecting; then the demonstrations of Bassi of the vegetoid nature of a disease, called the muscardine, found in silkworms, causing great mortality among them, opened up to pathologists a new field for observation, and led to the discovery that certain disorders in the higher animals, and even in man himself, were connected with the growth of a parasitical plant of a low type. About the same time Schœnlein was said to be the first who detected the presence of a parasite in the favus crust; and this was confirmed by Remak, Gruby, &c., and in 1845 John Bennett succeeded in inoculating the disease upon the human subject, and they have since been made the subject of further investigations by Lebert, Robin, Drs. Bristowe, Kuchenmeister, Thin, Taylor, and others.

Schœnlein, of Berlin, detected certain cryptogamic vegetoid forms belonging to the order Fungi. These observations have been confirmed by most eminent men; they were in too great haste to assume in the first place that these fungi were the sole cause of the

diseases which developed them ; and, secondly, that each kind of fungi (of which they found about four or five different kinds) also represented a special skin eruption, supposed to be developed under its own peculiar vegetoid influence, and then proceeded to give them names, such as *Trichophyton tonsurans*, a fungus supposed to originate ringworm, *Microsporon mentagrophytes*, to originate parasitic sycosis, and other such names ; and this theory remained until one still more learned brother taught that these fungi are known throughout nature by feeding on decayed matter, allying it with the *Aspergillus*, *Penicillium glaucum*, and other plants. This could not be the case, for those fungi will flourish everywhere, and would soon develope in the first suitable soil they came to. Some authors, and Mr. Erasmus Wilson, whose opinion must necessarily command respect, do not ascribe so much importance to these vegetoid fungi ; they rather look upon these diseases as proceeding from a mere morbid degeneration of the normal elements of the skin. This view can scarcely be correct, for the microscopic appearances and properties are similar to no other element or

degenerative product of the skin, and for the fact that these diseases can not only be propagated from animal to man, but will continue to grow after it has been removed from its epidermal bed, provided it fall upon a suitable soil.

Another question of much controversy arises. Is the same parasite the progenitor of these several diseases, as has been stated by some authors, Dr. Tilbury Fox and others? I think not; Dr. Manson of Amoy, China, who has been working on the subject I believe, agrees with me in this fact, although there may be coincidence of two or more diseases existing upon the same person at the same time, such as ringworm and epiphyton versicolor, or parasitic sycosis, as is mentioned by Hutchinson; and from the results of many experiments of successful inoculation by Professor Hebra and others, in no case has it been found that one and the same parasite produced a different eruption to that of its parent, or merged into another form of disease, and the microscopic characters are quite sufficient evidence to lead me to think that these parasites essentially differ both in size, shape, character, habit, and

mode of development, and are much influenced by climate as in the case of tropical ringworm, for they are varied in character in different parts of the skin in which they are severally found, and they differ very much in their mode of development, and especially in the mycelium from which the spores usually spring. In epiphyta tonsurans or ringworm, the cells are simple cell terminations of the threads; in versicolor or cloasma, there seems to be no gradual change, as in others of the threads, into spores, for the threads retain their original character of termination, and the spores spring mostly in rapid reproduction from their neighbours. In the favus parasite the spores are developed into simple threads of large jointed elongated cells, and the cell with its nucleus seems to bud out from them.

I will now endeavour to give a short description of the *Aids to Discovery, General Character, Diagnosis, Structure, Mode of Transmission, and Pathology*. In my next lecture I will then proceed to the *Classification*, and add a few short notes upon the *Situation, Cause and Pathology, Symptoms, Diagnosis, Treatment, and Prevention* of this class of

vegetoid parasitic skin disease and its sub-divisions.

Aids to Discovery.—As there seems to be some little difficulty in finding the fungi readily in these diseases, the following suggestions may prove of value :—

1. Choose if possible a subject in which the disease is not too far advanced.

2. Do not have too large a mass for examination, but take for a section a portion of the diseased patch showing well the defined broken hair loosened in the follicle.

3. The hair or hairs and epidermis chosen should be at once put into a solution of liq. potassæ and allowed to remain for a few hours, two or three hours are usually enough, and then immersed in Canada balsam or dammer—not glycerine, as in this substance a new form of vegetation is apt to spring up and to cause confusion.

4. Too much manipulation should be avoided.

5. A suitable microscopic power, the most useful object glass, is that of 'Zeiss' D, which is equal to a high $\frac{1}{5}$.

General Characters.—We have now pretty clear views as to the character of these fungi; they are limited to the epidermic structures, and are accompanied with more or less inflammation; they will not live upon a healthy surface, and are most prone to attack the young and those that have not been visited with specific diseases.

The changes that take place in the tissues of the epidermis pervaded with these parasites are somewhat extensive. Part of the epidermis becomes completely broken down, especially in the epiphyton tonsurans, and the cells of the rete mucosum undergo marked retrogressive changes, the connective tissue interspaces become often filled with pus cells, which are carried along the veins to the deeper layers of the cutis in the severer forms of the disease.

There is also some considerable inflammation often attendant on these diseases. The pre-existing cells of the epidermis undergo abnormal degeneration, not assuming the normal characters of the fungi, and the nutrition of the skin is greatly perverted. The parasite finds abundant nutriment in the soil of

these effete epidermic and excretory substances of the skin, but it is found that directly it approaches the area of inflammation, set up by its presence as a foreign body, it ceases to exist.

Diagnosis.—The correct diagnosis of the fungus element is important, as the conidia or spores are often mistaken for fat cells, air bubbles, blood discs, pus cells, and the nuclei of epithelium.

The conidia are unaffected by immersion in spirits of wine or chloroform, and most, if not all, other elements are destroyed by being placed in caustic potash or ether.

The mycelial threads, with their generally well-defined outline, can hardly be mistaken for any other structure, although they resemble at times a fibre of hair curled up and split off from its parent. They have also occasionally been mistaken for cotton and other threads.

Structure.—The general character and structure of these fungoid parasites in man consists of rapidly proliferating cell-growths called spores, sporules, or conidia, and thread-like bodies, or mycelium, with their stroma.

The spores, or conidia, consist of innumerable little bodies, of a diameter varying from about the 1-3,000th to the 1-7000th of an inch, or even smaller, are round or oval; they contain a nucleus and nucleolus, and mostly are found arranged either in groups or rows; these cells undergo rapid division and development, a fact which is observed in most of the cryptogamic plants.

These cells, in some instances, form themselves into chains or rouleaux, in others into groups, and give off prolongations in various directions.

The delicate membrane which surrounds these cells throws out various branches, which become converted into tubes, and these in turn contain at their extremities a number of spores, which become ejected, and again as free as sporules.

These fine thread-like transparent and jointed tubes or filaments are the mycelial threads, and are found to interlace among the cells of the cuticle, are nearly uniform in size, jointed, and made up of elongated cells containing granules ending in a single cell, or a cluster of conidia.

The stroma consists of an infinite number of

minute cells, the most active of all the elements of these vegetoid parasites, derived partly from the rapid proliferation of the cells, partly from the product of the cell tubes. In structure they are highly refractile, and contain an albuminoid fluid, in which numerous granules are seen to float.

Transmission.—The mode of entry into the skin is easily understood. These fungus germs, floating and carried about in the air near to their site of origin, soon settle themselves on the human skin-surface with its numerous orifices and fissures, and amongst the hair roots and cavities.

I do not believe these fungi are in any instance generated spontaneously, although I believe their growth and development may be considerably augmented by the nature of the soil upon which they settle, and this so often happens to be the case with ill-nourished children, with their sensitive organisms, collected together in schools under evil hygienic conditions, consequently all the more ready to take up these diseases; and adults of a scrofulous or consumptive tendency; but they may also flourish, as I have seen, on perfectly healthy skins, with sound constitutions to all appearances in one or two instances.

There can be now no question as to the transmission of these parasites both from man to man, and from animal to man; several instances of such cases I hope to show you in treating shortly upon the individual diseases set up by these parasites.

Pathology.—The conclusions I have been led to form with reference to the pathology of these diseases are:—

The vegetoid parasites are invariably introduced upon the skin, and entirely depend for their means of sustenance upon the nature, temperature, and excretion, and character of moisture upon the cutaneous surface, in both health and disease, upon which it deposits itself.

In epiphyta tonsurans, or ringworm, which is by far the commonest of these affections that come under our notice in the out-patient practice in this hospital, the parasite is only found in the superficial cells of the epidermis, in the hair-shafts, and upon the epithelium of the cavities of the root-sheath; in no instance have I seen it in the healthy tissues surrounding the processes either of the hair-root or the hair-papillæ.

The attendant inflammation usually seen in these cases, I do not think is set up by the absorption of soluble matters, the products of the parasite, as is said to be; but by the exceeding irritation upon the peripheral nerves, blood vessels, and lymphatics, set up by these parasitic cells or spores acting as a foreign body, and depriving the neighbouring skin of its full power of growth.

The same cause of irritation is shown in animal parasitic diseases, by their depositing their young amongst the healthy tissues, always setting up irritation, and consequent inflammation and enlargement of the lymphatics and their glands, as shown in the case of the young or nits of the *pediculis capitis*, or common head louse.

I believe these fungi are in every instance introduced upon the surface of the skin, more especially upon that of children and those who are accustomed to self-neglect, whose skin surface is always rich in effete matters, dandruff, dust, diseased or atrophied hair, and the salts and products of its sebaceous and perspiratory apparatus, which excretions from their acid reaction and composition, composed chiefly of

gelatine, margarine and margaric acids, I firmly believe the acid products of the sebaceous glands, under certain conditions of health, to be the chief source of growth and development of these fungi, and much influenced by contact with the alkaline secretion of the perspiratory glands, causing slight fermentation when not in that healthy and exact neutral proportion to be harmless.

We may compare the fermentation of yeast very favourably with the parasitic fungi, especially that of favus, and it will be seen to be almost identical in structure. It is as active in growth as the yeast ferment, and only differs very slightly in size and shape, those of the yeast being a trifle larger and more spherical, and with a greater number of reproductive cells with a clear nucleus in their centre; those from the skin mostly ovoid, very prone to coalesce, and produce the elongated cell from the exhausted pabulum upon which they exist.

From the above facts, we may safely conclude that in the skin fungi and the yeast ferment the result is the same, and depends more on the nature of the soil, if it contains more or less of an albuminous,

nitrogenous, or acrid material, together with warmth and moisture, for its favourable growth.

We find in the cutaneous excretion about 18 ozs. of water, of solid matter about 300 grains, of carbonic acid about 400, in the 24 hours; it is acid in reaction, and it contains a certain quantity of urea, which we know aids fermentation. The air becomes saturated with moisture when it comes in contact with the skin, the temperature of which is usually 20 to 30 degrees above its own, which is again a useful vehicle for the fungi.

The sweat glands, which average from 1-22 to 1-200th of an inch in diameter, are lined with epithelium, and contain a viscid fluid, and upon the back of the hand 400 has been given as the number in a square inch; much more numerous in other parts; they are greatly under the influence of the sympathetic nervous system, and this is shown from the well-known effects of mental emotion, sometimes suppressing the perspiration, sometimes causing it to be poured out in great abundance. In the horse this is shown to be very profuse under excitement, and these parasitic diseases are much more evident

in the animal, because his secretions contain more of their proper nourishment.

The circular appearance assumed by these diseases, ringworm and others, must be due to the way in which the spores float to the edge of the perspiratory moisture or drop, as it exudes from the skin, which naturally spreads in a circular direction, and in close proximity to the hair roots.

I firmly believe it is not an improbable view that cancer may be of fungoid origin; a degenerate germinal matter, the animal ovoid cell degenerates, and by its entrance into the circulation, produces a ferment and consequent blood poisoning; the elongated vegetoid cell becomes ultimately converted into the characteristic caudate cell, with the power of indefinite multiplication, soon destroying the vitality of the part, and even the life of the individual affected.

In the same way also, I am led to think that in the disorganised fluid, set free by decomposition of dead animal matters in wounds and carbuncles, the pernicious air germ finds its soil, and so produces the septic poison.

These facts, therefore, show us that direct, or even

counter-irritation, used with discretion in most of these diseases, must necessarily soon bring about a cure, for they not only destroy the parasite itself, but deprive it of its means of life, and its vitality is lost upon a sound and healthy tissue.

There are two ways in which we might expect to see benefit derived from local applications to the surface of the skin; by their direct action upon the peripheral ends of the cutaneous nerves, both local and general effects are thereby produced, and by becoming absorbed into the system are brought into contact with the diseased organs; it is, therefore, of the greatest importance to select those remedies whose effects we know will reach further than the mere skin.

LECTURE II.

THE DERMATOPHYTA OR VEGETOID PARASITES (*Continued*).

CLASSIFICATION.—Notes upon Situation, Cause, and Pathology—Symptoms—Diagnosis—Treatment, with remarks and reference to Prevention, of each individual Disease.

HAVING completed in my last lecture the Introduction, History, General Character, Diagnosis, Structure, Mode of Transmission, and Pathology, of these vegetoid parasites, concluding with a few remarks upon their general treatment, and examine each of these parasites and their diseases seriatim.

The classification I propose to put before you is that somewhat suggested by Hebra but who, still in his last work on the Skin, Vol. V., *New Syd. Soc.*, uses the misnomen (Tinea, a worm). I have substituted the word epiphyton (ἐπί upon, φυτόν a plant), rather than that of tinea (a worm), as at present adopted in the nomenclature of the College of Physicians, as its literal meaning is applied, I think, more to the plant-like nature of these diseases.

You will find in the syllabus before you ten classes enumerated, to which we may add that of epiphyton tropica, or tropical ringworm, the mycoderma or fungus foot of India, without going too far away from the well-known vegetoid parasitic diseases of our country, and as a few examples of these diseases are occasionally seen in England.

CLASSIFICATION.

DERMATOPHYTA, OR VEGETOID PARASITES OF THE SKIN.

I.—EPIPHYTON CAPITIS, OR TONSURANS: *Synonym*—Tinea Cap., or Tons., and Kerion.

Parasite—Trichophyton Tonsurans. Common so-called ringworm of the head, Fungus of the hair and epidermis of the scalp.

II.—EPIPHYTON CORPORIS, OR CIRCINATUM: *Synonym*—Tinea Corpis., or Circin.

Parasite—Trichophyton Circinatum. Ringworm or fungus of the body.

III.—EPIPHYTON SYCOSIS: *Synonym*—Tinea Syc., Mentagra. Parasite of the hair of the face.

Parasite—Microsporon Mentagrophytes.

IV.—EPIPHYTON FAVOSUM: *Synonym*—Tinea Favosa. Favus, or honeycombed ring-worm or skin fungus.

Parasite—Achorion Schoenleinii.

V.—EPIPHYTON VERSICOLOR: *Synonym*—Tinea Versic., Pityriasis Versic., Chloasma. Parasite fungus of the trunk.

Parasite—Microsporon Furfur.

VI.—EPIPHYTON DECALVANS: *Synonym*—Tinea Decal., Alopecia. Partial baldness of the scalp due to a parasitic fungus.

Parasite—Microsporon Audouini.

VII.—EPIPHYTON TARSI: Parasite fungus of the Eyelash or Meibomian Glands.

Parasite—Trichophyton.

VIII.—ONYCHIA-PHYTOSIS: Fungus Parasite of the Nails.

Parasite—Aspergillus (species).

IX.—MYCOSIS AURIS, ANI VAGINÆQUE MAMMÆ:

Fungoid Parasite of the ear, anus, vagina, and nipple.

Parasite—Oïdium Albicans (species).

X.—APHTHOPYTA: Fungus Parasite of Thrush, seen in the mouth of children.

Parasite—Oïdium.

XI.—EPIPHYTON TROPICA, OR TROPICAL RING-WORM.

Parasite—Tricophyton Marginatum.

XII.—MYCODERMA, MADURA OF FUNGUS FOOT OF INDIA.

Parasite—Chionyphe Carteri (disc. Vandyke Carter).

In taking the classification we first come to that disease known as:—

EPIPHYTON CAPITIS, or TONSURANS: *Synonym*—Tinea Cap., or Tons., common ringworm of the head, and *Kerion*, a more aggravated form of the same disease, accompanied with infiltration of pus cells into the epidermic tissues.

Situation.—To be found almost exclusively upon the heads of children, its parasite is called Trychophyton tonsurans.

Cause and Pathology.—It is a disease met with generally amongst children of the ill-nourished, ill-cared for, and lymphatic constitutions, and often those of a strumous or phthisical tendency, is very rarely, if ever, seen upon the adult skin, and is due to the ravages made by the above-named parasite upon the hairs and superficial cells of the epidermis of the scalp. The hairs, just external to the follicle become thicker, lighter in colour, dull, brittle, and broken, invested and split up with the spores and threads of this parasite. The cuticular layer of the hair becomes destroyed, and the medulla may be seen invested with the jointed threads or mycelium following the long axis of the hair, sometimes terminating in beaded tubes, sometimes simple threads and clusters of minute sporules, which are round or oval, transparent, and generally pretty well defined, sometimes containing a nucleus varying much in size, 1-7,000th of an inch, and larger. The mycelial tubes also vary much in size, jointed in some instances at long distances; in others is broken up into elongated nucleated cells, more or less oval in appearance, resembling spores, and which gradually

may become developed into chains of sporules, sometimes budding, and so become branches of the parent sporule thread.

If the disease is allowed to remain unattended to, as in *kerion* in the more advanced stages, considerable inflammation is set up by the irritation of the parasite, and a rapid accumulation of pus cells takes place, undermining the cutis and forming boggy non-suppurating tumours, raised a line or so above the surface, perforated by numerous foramina (being really the enlarged openings of the hair follicle), discharging a glairy-looking pus, and glueing together the surrounding hair, resolving themselves gradually under treatment, leaving more or less temporary bald patches.

Symptoms.—The symptoms of this disease usually manifest themselves in one or more dry and circumscribed spots or patches, varying in size from a half to four inches in diameter, the contiguous circle sharing the disease, and forming those characteristic clusters of fungi which are seen to surround the hair follicles; the hairs are dull and brittle, and upon microscopical examination appear to have been

broken off a line or so from their exit from the surface of the epidermis, and their stumps to be broken or split up and invaded by the parasite trichophyton tonsurans, with its numerous minute spores and mycelial threads. There is generally considerable attendant itching, and often obstinate bald patches are left, showing a few short broken hairs, having the appearance of a tonsure—from whence its name, tonsurans.

This disease may exist for an indefinite time if not attended to and left without any medical treatment, and atrophy may take place, the hair follicles becoming obliterated and permanent alopecia resulting, the disease itself ending quite spontaneously.

Treatment.—The treatment I find to be the most successful and rapid, and for the prevention of the spread of this disease, I have stated lately in a few cases published in the *British Medical Journal* and other papers, and consists in—

1. Complete isolation of the patient.
2. Disinfecting and boiling or baking all towels, etc.
3. Disinfection of occupied rooms with burning sulphur.

Great attention should be paid to cleanliness, diet, and general hygiene. The ill-fed should be well nourished by a fat diet, and any deficiency should be made up by the administration of cod-liver oil (and I find Leslie's preparation, and Pratt's jelly, the most palatable and easily digested with children) and iron tonics generally. Epilation, if properly carried out, in certain cases somewhat aids the rapidity of cure. I find a small and easily pliable pair of forceps the most useful for this purpose.

The hair should be cut short for a considerable space round the diseased patch or patches, and the head well washed with a little soft soap, or yolk of egg, according to the attendant inflammation, (which is effectual in cleansing the parts and preparing them for the use of the stimulating applications afterwards required). Yolk of egg is suitable in those cases that more especially require soothing. Nearly all these cases require some slight modification of treatment; occasional constitutional causes or idiosyncrasy may call for special attention.

I have found sulphurous acid washes, about the

strength of 3 ij. to the ℥j. of much use, especially that formed by the decomposition of hyposulphite of soda by a dilute acid and perchloride of mercury, with the addition of glycerine to prevent too rapid a desiccation, and in the more severe forms of the disease and in kerion a dilute lotion of the acid nitrate of mercury very effectual; and it must be always borne in mind that sufficient irritation must be set up in the tissues of the epidermis to cause destruction of the parasite, at the same time complete renovation of the epidermal elements.

After the slight inflammation has subsided from the effects of the above-named applications, or others of a like nature, I use an oleaginous preparation one oil of cade or juniper tar, and pure liniment of iodine, and paint it over the diseased patch every third or fourth day; and as soon as the diseased patch has disappeared, which we cannot diagnose safely without the use of the magnifying glass and the microscope, and the new young hair has begun to show itself (and it generally commences to grow from the circumference of the patch to the centre), I use some slight stimulating ointment or

pomatum containing one or other of the mercurial salts, from 5 to 20 gr., ad $\mathfrak{z}$ j of benzoated lard. Those patches, generally about the size of two or three inches in diameter, will usually require from two to three months' treatment before their cure and a growth of new healthy hair appears upon them.

The early treatment of kerion ought to be soothing; never attempt to open the abscesses or boggy tumours, or a troublesome open wound may result, and remain for some time; here epilation is more effectual, for the parasite is deeply imbedded in the hair-roots and follicles. A mild anti-parasitical lotion and ointment, such as the red oxide of mercury, should be used; and a lotion of bichloride of mercury i. or ii. gr. ad $\mathfrak{z}$ j., and creosote, is very curative.

A question is often asked by parents or guardians of children—"Is the child cured, and when may it return to school?"

The following rule seems to me to be the best and safest:—So long as any trace of these furfuraceous patches remain upon the head, showing the characteristic dull, short, broken hairs, pervaded with their minute vegetoid organisms, on careful microscopical

examination, the child is not cured, neither must it be allowed to return to school.

If the ringworm parasite should affect the nails of the person affected, the best treatment is to cut or file away the nail down to the seat of the disease, then well soak the nails in a solution of sulphurous acid and glycerine. The disease becoming arrested, the new and healthy portion of the nail pushes out the diseased, which is gradually and finally shed.

II.—EPIPHYTON CORPORIS, or CIRCINATUM. *Syn.*—Tinea Corporis or Circin. *Parasite*—Trichophyton circinatum. Ringworm of the body.

Situation, Cause, and Pathology.—This disease appears upon the face, neck, and back, sometimes upon the extremities of children, and, less frequently, adults. The cause and pathology of this disease is much allied to and often proceeds from that of epiphyton tonsurans, only that the fungus sets up more irritation upon the skin of the body, causing a slight effusion of serum, with rather more inflammation, and generally with the production of small vesicles and consequent desquamation of cuticle, and it seems to require much less of the fungoid

parasite as a cause of the eruption. The increase and growth is more rapid upon the body than upon the head. This fact again inclines me to believe that the natural warmth and moisture of the body, with its acrid and perspiratory elements, are its chief source of vitality.

Symptoms.—The first symptoms of this affection are the appearance of minute vesicles, extending in an erythematous circle about half an inch in diameter equally in all directions, upon a red and somewhat inflamed base (not elevated much above the surrounding skin), or studded with small papules limited by a well-defined line or circle, the central part or area appearing generally healthy-looking. The size of the patch varies in proportion to the quantity of fungus introduced upon the surface, and the degree of susceptibility of the skin of the patient. These vesicles crack, and their secretion dries up, forming small horny scales, very easily detached; the process of inflammation and vesiculation goes on in a centrifugal form of growth, leaving the parts previously affected in the above-mentioned scaly condition. Irregular or sometimes gyrate

patches may creep and extend over considerable space, even over the whole body, as is seen in the case of tropical or Burmese ringworm; this form is not confined to the larger patches, but is often noticed as scattered patches of small rose-red spots, dispersed over the trunk. When the disease attacks the palm or surface of the hands or feet, the vesiculation and excoriation is much more distinct. The form of disease contracted from the horse and other animals (a very good example I have lately had under my care at this hospital), is always much more severe in character, especially in tropical climates; the parasite is very much more prolific, the inflammation and vesiculation are well marked and of a decided herpetic character, the patches are more numerous, and exfoliation more extensive, so that it has often been mistaken for eczema, herpes, &c., and it is situated mostly upon the hands, arms, and legs of those who are thrown in contact with the diseased animals.

Treatment.—The treatment I employ in this disease is very similar to that used in epiphyton capitis. This disease is much more amenable to

the treatment than the last-named affection, and more especially if taken in the early stage. The skin should be well washed with soap and water before using the application; one or two dressings with blistering fluid, or Coster's paste, with the use of a little stimulating ointment or lotion, will soon effect a cure. In the more obstinate cases the application of Bullen's liquor vesicatorius, with the application of lint soaked in sulphurous acid or bichloride of mercury lotion, will prove most effective.

III.—EPIPHYTON SYCOSIS. *Syn.*—Tinea Syc, Mentagra. Parasite of the hair of the face. *Parasite.*—Microsporon Mentagrophytes.

Situation, Cause, and Pathology.—This disease is found upon and invading the hairs and follicles of the chin and upper lip, eyebrows, and sometimes pubic regions. A fungus invading the hair follicle and its epithelium, forming a well-marked fringe round the hair root, setting up considerable inflammation in the subjacent vascular structures. The spores are very minute, and the filaments branch at right angles, showing a cluster or clusters of spores

at the terminal cells or joints; and found in the beard of adults or middle-aged men. There is also some induration extending into the deeper layers of the corium. (*See plate*).

Symptoms.—The symptoms begin with slight burning sensations and itching, with tension and induration of the follicles of the hairy parts of the chin, sides of the face, and upper lip, the eruption of small red papules or pimples, which in a few days proceed to small yellow pustules, mostly perforated by a single hair; the skin assumes a purple tint around, and the hair becomes altered in colour, grey hair becoming pervaded with a brown pigmentary substance; in five or six days the pustules discharge, forming yellowish brown crusts, which disappear in ten to fourteen days, but only to arise in a fresh site, and gradually to invade the whole beard or moustaches, the hair becomes matted together, and the surface of the skin even ulcerated at times, and the disease very obstinate.

Diagnosis.—The hairs in parasitic sycosis are looser, and under the microscope are shown to be invaded with the parasite, the disease is of a more

scaly nature, and accompanied with more induration than in simple acne or sycosis. The very minute character of the spores and their peculiar branched filaments are sufficient diagnosis, microscopically.

The *Treatment* consists in well washing the diseased parts with yolk of egg and warm water, or oatmeal and warm water, or the sulphur vapour douche. The hair should be cut short with scissors and epilated, and the indurations should be attacked with acid nitrate of mercury and a wash of the same, only in a very dilute form, and a mild stimulating ointment, with the use of cod-liver oil and tonics, will generally effect a cure.

IV.—EPIPHYTON FAVOSUM. *Syn.*—Tinea Favosa, favus, or honeycomb ringworm. *Parasite.*—Achorion Schoenleinii.

Situation.—The orifices of the hair follicles of the head, and upon the epidermis of any part of the body, and the nails.

Cause and Pathology.—The cause of this disease is due to the development of the parasite Achorion Schoenleinii, the spores of which are about one three-thousandth of an inch in size, round or oval, with

well-defined outline containing nucleus, and sometimes granules. The tubes are much varied in size, from one three-thousandth to one fifteen-thousandth of an inch in diameter. There is also an immense quantity of stroma to be found in the cups. The parasite pervades the deep layers of the epidermis, but is found also upon the cutis; the fungus spreads downwards, loosening the hair in the follicle, invading it, and rendering it opaque, and it also attacks the epithelial scales. The surrounding scales become disturbed, slight inflammation takes place in the neighbouring tissues, a portion of the epidermis becomes raised into small yellowish-white spots, gradually increasing in size to the cup-shaped crusts with concave depressions in their centres, averaging about one-twenty-fifth of an inch, in the centre of which the fungus is found, surrounded by an inflamed area, and generally perforated by a single hair. The crusts are composed of a kind of effete amorphous material, and contain numerous mycelial threads and spores of comparatively large size; the threads are distinctly jointed, and contain a nucleus, are branched, and terminate in strings, simple

threads, or clusters of spores. The hairs are also found to be greatly invaded, and the neighbouring epidermic structures interlaced with the parasite. But the hair is not the chief seat of the disease, as is the case in epiphyton tonsurans; the epidermis is the principal soil for the parasite. (*See plate*).

Symptoms.—The disease is usually seen to commence as small round patches of yellow pustules or vesicles about half an inch to an inch in diameter, situated upon the scalp surrounding the hair roots, increasing in size in a few days to the favi, containing a yellow glairy fluid, and hardening gradually into the cup-shaped crusts of a yellow colour and of a musty smell, noticed more in the advanced stages of the disease; ulcerations are formed which destroy the hair roots, producing almost incurable baldness. Favus is very liable to attack all parts of the epidermis, and the nails may become affected; they are thickened, opaque, brittle, and very much inclined to split up in their longitudinal striæ. The health of the patient is generally good, but of course much influenced by the hygienic surroundings, damp situations, exposure, and uncleanness.

Diagnosis.—The characteristic cup-shaped appearance of the crusts and the microscopical characters of the parasite easily distinguish it from eczema, impetigo, and all other diseases; the crust of the impetigo being of a convex shape, and devoid of fungus elements.

Treatment.—The early and local treatment is of the utmost importance in this affection, the general health and hygienic conditions being attended to; poultices and soothing applications of oil should be used, and all the crusts carefully removed, the surface well washed with yolk of egg, and warm water, and after this the application of the parasiticide lotions, sulphurous acid, carbolic acid, &c. The hair should be closely cut and epilated, but this is not a matter of so much importance as in epiphyton capitis. After the epilation, an ointment of iodide of sulphur, or the black sulphuret of mercury and cod-liver oil in equal parts, with the addition of a little creasote, is very beneficial. Should the nails become affected, the same treatment as that of the ringworm affection is applicable. Healthy exercise, with the continued use of cod-liver oil, iron, and

arsenic, as tonics, is all that is needful in the constitutional treatment.

V.—EPIPHYTON VERSICOLOR. *Syn.*—Tinea Versic, Pityriasis Versic, Chloasma. Parasite of the trunk. *Parasite*—Microsporon Furfur (μικρός, little, σπόρος, a seed), disc. [1846] by Eichstadt.

Situation.—It is seen mostly upon the chest, abdomen, the axillary and pubic regions, and sometimes over the whole trunk.

Cause and Pathology.—The cause is due to the appearance and attack of the above-named fungus with its minute spores, the smallest of nearly all the vegetoid parasites, being about the eight-thousandth of an inch, and the branched filaments forming a delicate network among the epidermic scales; the spores arising in clusters from the ends of the threads, also in rapid development from the sporules. (*See plate*).

Symptoms.—The disease commences as small erythematous points, attended with itching, appearing about the chest, axilla, or pubic regions, in the form of yellowish-brown spots or patches, gradually spreading and becoming confluent over the whole trunk, of a well-defined margin, and slightly ele-

vated, with small bright dry scales, easily detached, and more especially found on those parts of the body covered by flannel or other material. The colour of the eruption varies with the nature of the complexion of the patient. The disease being entirely confined to the epidermis, is not accompanied by inflammation. If the disease is of long standing, the scales of the epidermis become loose, and copious desquamation of minute bright scales takes place. The disease has not been known to attack persons before the age of puberty, and is found more frequently among men than women. This disease is very contagious. I have seen several cases in which the history of the contagion dates from the patient lying in the same sheets as those used by a person affected with the disease, and it has no respect to persons, for it is seen as often on the skins of the robust and healthy and those of the most cleanly habits, as upon those of dirty and unhealthy people.

Diagnosis.—This parasite is so minute, that it requires at least a one-eighth object glass to see it. The only diseases it is likely to be mistaken for, are syphilitic stains, or eczema in its early stage, and ephelis, or sun stain.

The microscopic appearance is almost a sufficient diagnosis.

Treatment.—The treatment in most of these cases is simple; the skin should be well washed, a lotion of hyposulphite of soda, ʒj., ad ʒj., or sulphurous acid, ʒij. to the ʒj., and bichloride of mercury, gr. ii., ad ʒj., suspended in glycerine, and applied two or three time a day, and with the use of an ointment at bedtime of the ammonio chloride of mercury, gr. xxx., ad ʒj., I find sufficient to effect a cure in a short time. The vapour bath of sulphur or mercury is also very effective.

The patients should not wear the same clothes, and especially flannel, for any length of time, and these should be thoroughly disinfected.

The next disease, and one of the most interesting and least understood of all these diseases, that called—

VI.—EPIPHYTON DECALVANS. *Syn.*—Tinea Decal., Alopecia. Partial baldness of scalp. *Parasite*—Microsporon Audouini.

Situation.—It is generally found upon the scalp; it also may attack the eyebrows, beard, and all the hairy parts of the body.

Cause and Pathology.—In this disease there is great difficulty in finding sufficient quantity of the parasite to account for the rapid inroad of the disease upon the hair, but there is no doubt that it is occasionally found. It is about the one twenty-thousandth of an inch, and consists of minute round spores and short wavy filaments. The development of it is most rapid, invading the hair, which assumes a brittle, dull, and bulbous appearance, easily split, the root becomes atrophied, and the hair falls off very quickly. (*See plate*).

The *Symptoms* of the disease commence with slight itching, the hair becomes dry and brittle, and the part affected has an œdematous appearance. The hair rapidly falls out in more or less circular patches, leaving the skin quite bald, as I have seen it in the short space of a month, and sometimes spreading over the whole scalp; and in grey hair considerable change of colour takes place, a deposit of greenish material occupying the medulla. When the disease is due to the parasite it is contagious, and must not be mistaken for several other affections of the hair, assuming baldness, as simple atrophy of the hair,

vitiligo, lupus erythematosus, last stage of epiphyton tonsurans, and favus, loss of nerve power, syphilis, and scars. A careful microscopical examination will show the true character of the disease, as described above.

The *Treatment* I usually employ is a blistering fluid at the onset of this disease, and creasote in solution, or an ointment of bismuth nitrate, 3 ij. ad 3 j., oxide of mercury or manganese, gr. xx., and bichloride of mercury, gr. ii., with benzoated lard, with castor oil and vaseline, or with the exhibition of iron or some form of tonic with arsenic; the *rationale* of treatment being to produce an altered state of the system, and to check the minute organisms which form the characteristic feature of the disease.

VII.—EPIPHYTON TARSI. *Syn.*—Tinea Tarsi. Parasite of the eyelash and Meibomian glands. *Parasite*—Tricophyton tarsi.

Situation.—It is situated among the hair follicles and Meibomian glands of the eyelids.

Cause and Pathology.—The disease is due to the parasite trichophyton, which invades the orifices of the glands, and extends to the hair roots, causing

considerable inflammation, and outpouring of the secretion of the glands.

Symptoms.—The eyelids appear swollen and inflamed, the secretion in which the fungus is found, accumulates in yellow glairy crust upon the edges of the lid and about the orifices of the hair follicles, the hairs all gradually falling out.

This disease comes more especially under the eye of the oculist.

The treatment I find most effectual in this disease, is to anoint the edge of the eyelids night and morning with an ointment of ung. petrolii, or vaseline, containing a few grains of red oxide of mercury.

VIII.—ONYCHIA-PHYTOSIS (όνυξ, a nail, φυτόν, plant). Fungus parasite of the nails. *Parasite*—Aspergillus (species).

This disease of the nails, is due to a vegetoid parasite, existing apart from either of the before-mentioned diseases.

Situation.—The disease is only situate in the nails.

Cause and Pathology.—The nails may be affected by all the before-mentioned parasites, at the time of their attack upon other parts of the body. They

alone may also be the seat of disease. The fungus attacks the sides or root of the nail, setting up much inflammation and alteration of structure. The spores are very much like the favus parasite, only smaller; the threads assume the chain-like appearance, described in my last lecture.

Symptoms.—There is considerable change in the character of the nail, the longitudinal striæ become separated, giving the nail a ragged appearance; the fungus is found to invade the substance of the nail, extending as far as the root. The superficial laminæ become loosened, and small yellowish-coloured spots are seen following up the course of the longitudinal striæ, and the bed is covered with a dark yellow mass of nail substance, pervaded more or less with the parasite.

Diagnosis.—The presence of the parasite diagnoses it from all the other more common affections of the nail, syphilis, etc.

Treatment.—The treatment I adopt is the same as in the ringworm and favus affections of the nail.

IX.—MYCOSIS AURIS, ANI, VAGINÆQUE, MAMMÆ.
Fungoid parasite of the ear, anus, vagina, and nipple.
Parasite—*Oidium Albicans* (species).

This disease is of an intensely irritative nature. It is found in the orifice of the vagina and anus, due to the presence of a parasite, of the character of the oïdium albicans, of the same type as that seen upon the female nipple, and very much allied in character to the fungus parasite of thrush.

The *symptoms* are those of intense and continued irritation of a neuralgic character, about the anus and vagina, or margin of it, showing a minute papular eruption of grey appearance and moist, the parts becoming excoriated and exceedingly tender.

The usual parasiticides will generally relieve these diseases, preceded by soothing applications, such as hydrocyanic acid, or chloroform lotion, ʒ ij. to ʒ j., and a creasote ointment.

In aural mycosis the fungus is more of the nature of mouldiness, due to the accumulation of wax and moist effete matters in the external ear. The fungus is of the aspergillus species. This disease is accompanied with much irritation, and often loss of hearing power.

X.—APHTHOPHYTA, parasite of the thrush, seen in the mouth of children. *Parasite*—Oïdium.

I have added to the ordinary classification, that disease commonly known as thrush, situated on the epithelium of the mucous membrane of the mouth, lips, and sometimes anus of children.

Cause and Pathology.—The mucous membrane of the mouth becomes changed into an inflammatory dark-red colour, the secretion of the salivary glands and mucous follicles becoming altered. If the secretion of the latter is allowed to remain and accumulate, it becomes sour and intensely acid, and if the alkaline fluid is not in sufficient quantity to neutralise the acid secretion of the follicles, a free acid is generated. If a small portion of the mucous membrane, with its epithelium, be taken and examined microscopically; basement epithelium, a great number of well-defined bodies, thallus filaments and spores, sometimes collected in clusters, at others in twos or threes, and recognised as fungus spores of the *oïdium albicans* type. The small white spots become rapidly confluent, and spread over the entire mucous membrane of the mouth. The fungus adheres to the pavement epithelium, not upon the ciliated or cylindrical, consequently the disease is liable to

spread to the lips, mouth, fauces and œsophagus.

Symptoms.—The mucous membrane becomes inflamed, as described above, the temperature of the mouth raised, and the surface very tender, with alterations in the secretions of the glands; the symptoms are generally accompanied by a papular rash extending over the whole skin.

Treatment.—I consider the whole principle of treatment depends upon the acrid secretions of the mouth being altered and rectified. A solution of bicarbonate of soda and borax, about twenty grains to the ounce, and painted over the diseased patches three or four times a day, will soon clear the mucous membrane of this parasite.

XI.—EPIPHYTON TROPICA. Tropical ringworm, or skin fungus. *Parasite*—*Trichophyton marginatum*.

Synonyms.—Burmese itch or ringworm, Eczema marginatum.

Situation.—This disease, though rarely seen in England, is by no means unimportant, as it is common in the Tropics, especially amongst the natives. Its usual site is upon the inner surface

of the thighs, the perineum, scrotum and buttocks. It may also be seen about the axillæ, and calves of the legs.

Cause and Pathology.—It is now an undisputed fact that this troublesome eruption is due to a fungoid parasite, not to any degenerative process of the epidermis alone, as is described by some authors Kaposi, Köbner, and others, who now acknowledge it to be parasitical. At those parts of the body where the folds of the skin come together, as the buttocks, axillæ, the secretions are poured out, and afford a pabulum to the fungus, increased by tropical heat and moisture, which irritates and maculates the epidermis; we have then a vesicular, exematous eruption caused, which is secondary to the primary disease. Lying in damp places and houses, and sleeping in damp sheets, is, no doubt, a common cause. Who has not seen mouldy sheets that have been put by some time, in travel, and in a tropical clime this is made a very active fungus; and it differs from ordinary British ringworm—a fungus of the skin and hair, inasmuch that its growth is much more luxuriant, and does not destroy the hair, nor is

the parasite able to be seen in or around the root sheath of the hair. (*See plate*).

Symptoms.—This disease begins as an intensely irritable, spreading eruption, showing vesiculation and erythema at its margin; its course is very slow and its nature very chronic like the British fungus; it spreads in circles, only in a much larger area, and it chooses the covered parts of the body for its attack, and those where the perspiration is the freest. It is influenced greatly by tropical heat in producing the fermentation of its two secreting processes in a peripheral direction. The eruption is raised slightly above the surface of the surrounding skin, beginning at first as a small circle, red and irritable, about half an inch in diameter, rapidly increasing in size, with small bright scales on its surface; or if in contact with other skin of a greyish and intensely red appearance, increasing in irritability and vesication.

Diagnosis.—This disease can be at once recognized by those who have once seen a typical case. It is liable to be taken for epiphyton circinatus, eczema, psoriasis gyrata syphilitica, intertrigo, but

its microscopic character, and its common situations is its diagnosis.

Treatment.—Tropical, so called ringworm, is a most difficult eruption to cure, even if it is relieved in England, as soon as the patient returns to the tropics it is almost sure to return, if not treated successfully, at least this is my experience. Oleate of mercury is a valuable remedy, or the liq. carbonis detergens freely painted over it is very effectual; or Hebra's soft soap, sulphur and tar application is good. Goa powder is generally used in India, with stated good effects. The daily inunction of carbolised oil I find a good remedy in the cases that are met with in England.

XII.—MYCODERMA, MADURA OR FUNGUS FOOT OF INDIA. *Parasite*—Chionyphe Carteri (disc. Vandyke Carter).

This disease, confined chiefly to Eastern countries, I shall very shortly notice. It is found generally in the feet, but may also appear in the legs, hands, and arms.

Cause and Pathology. The integuments are raised into small elevations, showing a central aperture

leading to a sinus. These patches are interspersed with small black masses, described as being like fish-roë. From these sinuses is discharged a sero-purulent fluid, intermingled with black and white substances, or grounds. These black masses were examined by Dr. Bristowe, and found to contain a fungus element of the nature of the oïdium.

The treatment consists in the free use of caustics in the early stage, and sometimes even partial amputation must be resorted to, if the disease has extended very deeply into the tissues.

THE ANIMAL PARASITIC DISEASES OF THE SKIN.

LECTURE III.

INTRODUCTION.—Classification—History—Natural History of Insect. Disease, General Character, Diagnosis, Symptoms, Treatment, Pathology and Remarks.

CLASSIFICATION.

- I. DERMATOGIA, or those parasites which dwell in the substance of the skin, and their accompanying eruptions.
- II. ENTOGIA, or those parasites which live upon the surface of the skin and its appendages, and their accompanying eruptions.

DERMATOGIA.

- DISEASE.—I. *Scabies or Itch*. 1. *Acarus Scabiei* or Itch Insect.
- II. *Acne*. 2. *Acarus* or *Dermogex Foliculorum*, the pimple mite.
3. *Leptus Autumnalis*, the harvest bug.
4. *Pulex Penetrans*, sand flea or chigoe.
- III. *Guinea Worm Disease*. 5. *Filaria Medinensis* or guinea worm.

ENTOGIA.

- DISEASE.—I. *Phthiriasis or Morbus Pedicularis*. 1. *Pediculus Capitis* or common-head louse.
- II. *Prurigo*. 2. *Pediculus Corporis* or body louse.
3. *Pediculus pubis* or crab louse.
4. *Pulex Irritans* or common flea.
5. *Cimex Lectuarius* or common bug.
6. *Culex pipiens*, or gnat.
7. *Æstrus* or bot, or gad-fly and ant.

With the intention and the hope of engaging attention to a class of skin affections that in a sanitary point of view so much concern the entire community, I propose to bring under the notice of those who may honour these lectures with their perusal—that class of cutaneous diseases, better known to most of us than the vegetoid parasitic skin eruptions, viz: Those affections of the skin set up or made manifest by the irritation caused by an animal parasite.

I believe no class of eruptions has furnished so fertile a subject for writers from the earliest ages to the present day.

The oldest of the Greek writers, Aristotle, Galen and others, included Scabies and all cutaneous disorders under the head of ψώρα, or itch and λέπρα, (scaly diseases), for the same reason perhaps that many are inclined in the present day to ascribe so many diseases to eczema. Aristotle spoke of the ἄκαρι or itch insect and φθειρες or lice (those animals that live in vesicles containing no pus) meaning most likely the larvæ of the acarus.

The Hebrew word Zaraath spoken of in the Book

of Kings in the Scriptures with reference to Naaman when he went to Elisha to be cured of the *Zaraath* and was ordered to dip seven times in the river *Jordan** and was cured, was in all probability the Itch, and Celsus gives a description of a disease called *Scabies* affecting men and sheep. Indeed the history of this class of affections has been fully described by many authors in all ages and in all parts of the world; many causes may exist for this extraordinary circumstance, by reason of its every day occurrence, its perpetual continuance with the person attacked, unless a suitable treatment is used, and above all its contagion, that fruitful source of fear and vague misgivings, which the most learned were puzzled to account for by a reasonable hypothesis.

I will now proceed to the Classification, History, Natural History of Insect, General Characters, Diagnosis, Symptoms, Treatment, Pathology and

* The waters of the River Jordan deposit on its banks a resinous substance, largely composed of sulphur, no doubt derived in its subterraneous course which exists on its way to the Red Sea, and was much used for the cure of skin diseases.

Remarks upon the Diseases of the Skin and the parasites by which they are caused.

I propose to divide them into two classes.

I. The *Dermatozoa*, or those parasites which dwell in the substance of the skin.

II. The *Entozoa* or those parasites which live upon the surface of the skin and its appendages.

CLASS I.

DERMATOZOA AND THEIR ACCOMPANYING DISEASES.

DISEASE.—I. *Scabies or Itch*. 1. Insect, *Acarus Scabiei* or itch insect.

II. *Acne*. 2. *Acarus* or *Dermodex Foliculorum* or pimple mite.

3. *Leptus Autumnalis*, harvest bug.

4. *Pulex Penetrans*, sand flea or chigoe.

III. *Guinea Worm Disease*. 5. *Filaria Medinensis* or guinea worm.

CLASS II.

ENTOZOA.

DISEASE —I. *Morbus Pedicularis.*

1. *Pediculus Capitis* or common-head louse.
2. *Pediculus Corporis* or body louse.
- II. *Prurigo.* 3. *Pediculus Pubis* or crab louse.
4. *Pulex Irritans* or common flea.
5. *Cimex Lectuarius* or common bug.
6. *Culex Pipiens* or gnat.
7. *Æstrus* or bot or gad fly.

The most important and well known eruption of the skin in this class is *Scabies*, or that disease commonly known by the name of the itch.

SCABIES or *Itch*,

Due to the presence of the parasite *acarus* or *demodex scabiei*.

CLASSIFICATION.

SCABIES.	Species.	Division.	Form.
	Papulata.	Localis.	Sparsa.
	Vesiculata.		Confluenta.
	Pustulosa.		
	Scabida. }	Generalis.	Inveterata.
	Ulcerosa. }		

History.—This disease has long been known, and its description and history have been handed down to us from the earliest ages, and there seems to be great variance of opinion as to the exact time when the real cause of it was determined, *i.e.* when the insect was first discovered. According to Hebra it was first discovered in the twelfth century by the monks of the convent of Ruperts-Berg near Bingen, and an account published by the Lady Superior (Saint Hildgrade) and after, by our own countrymen Thomas Mouffett in 1634, and as late even as 1812, the beginning of the present century, much doubt existed as to whether the disease was due to an insect or no, others to an altered state of the secretions, the perspiratory or glandular apparatus, in the same way which I endeavoured to show that the vegetoid parasitic diseases derived much of their origin, or to a syphilitic or scorbutic taint.

In the early part of the 17th century a most complete investigation was made by Dr. Giovanni Bonomo, which was published by Redi, a great student of Insects; and about the time the micros-

cope was discovered by Jansen of Middleburg, and in the latter part of that century John Hunter mentioned in his writings that he had examined the insect with a magnifying glass.

It was also referred to by Mead, a great Physician, in 1702, in the Philosophical Transactions; soon after this period it was overlooked and its existence disbelieved, and I have heard it related that in 1802 it was discovered in the Hospital St. Louis by a student who was said to have imposed upon all the savants of Paris, by substituting a cheese-mite as a result of his research for the true acarus, a fact substantiated by his leaving a print of the insect.

But to Eichstedt of Greifswald, in 1846, is due the credit of first describing accurately, and giving drawings of the burrows of the acarus and its eggs.

For the anatomy and natural history of the insect I will endeavour to give you the result of my own microscopic investigations. It is as follows:—

Natural History.—It belongs to the order Acarina proper, *Genus*, Sarcoptes (*hominis*). (*See plate.*) On

turning out of the vesicle with the point of a fine needle under the microscope, the insect is discovered in very active motion, covered with short hair and spickles, not unlike a tortoise in shape, and almost transparent. It is provided with a short head, with a mouth slit on its under surface, a pair of strong mandibles or cutting jaws, and palpi; with eight legs, two pairs of which are in front, and a single pair at either side, which arise from the under surface of the body, and terminating in curious appendages: each anterior one is provided with a pedunculated sucker and has no joint. It is without eyes, and when disturbed, quickly draws in its head beneath the dorsal plate. The dorsal appearance is convex, and is marked with transverse fissures, which show the following appendages:—A number of small triangular elevations, each ending in a sharp pointed apex, numbering about 60, oblique in direction, a number of conical projections, more scattered and towards the anal region, and often much smaller blunted eminences, for the purpose no doubt of facilitating the movements of the acarus. The abdominal surface is comparatively smooth, and there extends about a

third of its length, a species of sternum entering into the formation of the first pair of legs. It is male and female. The male is smaller in size than the female, and is hexagonal in shape; the generative organs show a distinct penis, surrounded by two folds of skin. The female usually lays from 16 to 20 eggs, concealing them beneath her body, carefully depositing them in grooves or furrows, arranged (*see plate*) in pairs, these are hatched in about 10 days. The female alone is the worker in the skin, the male confining himself to the surface, she takes only about 20 minutes to work her way under the skin, commencing to burrow her canal (which is $\frac{1}{25}$ in. broad), continuing her course for a short space obliquely, by means of bristles supporting herself, entering at right angles to the skin, penetrating to the deeper layers of the epidermis being unable to retrace her steps, continuing it until she reaches about five lines or so in length in a straight, or tortuous direction, she deposits her eggs as she goes, and finally stops at the end of the canaliculi, making her bed and getting her nourishment, always seeking out the most succulent parts of the skin. The

larvæ or young of the acarus differs from the full grown insect, in that it has but two hind legs, instead of four, soon it throws off its covering and appears with eight, the larvæ burrows more deeply under the skin and produces more irritation and vesiculation. The size of the female varies from $\frac{1}{7}$ to $1\frac{1}{4}$ lines in length, is oval in shape, broader anteriorly than posteriorly, has six legs, four anterior two posterior, three pairs of joints, two pairs of suckers, with jointed segments.

The male has the first, second, and fourth pair of legs provided with suckers, the third pair alone have bristles.

The itch acarus has been found in most of the lower animals, the horse, dog, sheep, lion, birds, and rats, assuming more or less the same form, size and shape.

Now *Scabies* furnishes us with a very characteristic example of "one exciting cause," producing in the same part of the body of differently constituted persons nearly every variety of eruption of which the skin is liable, such as papulous, vesiculous, pustular, and ulcerative. I have seen it much simulate also

eczema, urticaria, ecthyma, varioloid eruption, varicella and other eruptions, not running through the various stages of these different affections, but only showing those symptoms most noticeable in scabies, which subside when the parasite is destroyed and the disease is cured; and when persons become infected who neglect to wash themselves very frequently and change their clothes, the eruption becomes very inveterate, vesicles and pustules arising among the papules, the acarus rapidly breeds, and spreads over the whole body, and the disease becomes very contagious. We may therefore *diagnose* scabies as a vesicular disease, which attacks those portions of the skin, where the follicles are most abundant, and that no state or rank of society are liable to be exempt from its attack, it usually commences at one spot and extends over the whole body or those parts of the body that are out of the way of friction.

The discovery of the acarus and its canaliculi which is generally found extending from the vesicle a short distance, is quite sufficient reason to distinguish the disease from most of the other eruptions;

the site usually occupied by the acarus, and the character of the eruption, from prurigo, lichen, eczema, herpes, varioloid eruption and others, and from the fact that scabies very rarely attacks the face.

The most evident symptoms of diagnosis are :—

Diagnosis.—1. The contagious nature of the disease.

2. The accompanying irritation especially at night.

3. The site of the eruption.

4. The presence of the parasite in the crusts.

5. The absence of feverish symptoms.

6. The multiform character of the eruption.

7. The isolated and pyramidal form of the vesicles.

8. The presence of the canaliculi on the surface of the skin.

Position.—Scabies is usually to be met with on the dorsal surface of the hands between the fingers, at the wrists, upon the feet, the generative organs, the penis, etc., the arms, and front of the cheek, and sometimes over the whole body, but seldom on the face and head.

Incubation.—This period is generally allowed to be two or three days, but I have known it to be

much shorter, even to show itself in 10 or 12 hours, especially if favoured by warmth.

Symptoms.—The symptoms of scabies in its early stage are very erratic, but itching is invariably the first manifestation; and generally about the second night after contagion intolerable irritation commences. Here a few straggling rosy red papules, or a single pyramidal vesicle or clusters of vesicles, show themselves with the irritation, which I have no doubt is caused rather by the hatching of the ova than by the burrowing of the acarus, and the explanation seems to me to be this: An ovium of the acarus becomes transplanted into some fold of the skin of the person affected, the animal warmth soon hatches the insect, the irritation this occasions produces a slight vesication which the insect tries to escape, and constantly works to some part of the pimple, causing the vesicle or raising the cuticle, and opening a passage for its progress, then it deposits ova in the liquid surrounding it, causing so much itching as to induce the patient to scratch, tearing open the vesicle, and scattering its contents around, to renew the original process, until part after part becomes affected.

The most frequent position in which the disease is found, is on the dorsal surface of the hand between the fingers and the inner surface of the wrists, the primary symptom in these situations is usually vesicles, rapidly becoming pustular.

Papular.—When the face becomes attacked the eruption is generally papular, also the front of the forearm is similar in character in eruption. The penis and that part of the abdomen below the navel, and the axilla, afford sometimes the papular evidence of the disease, with more or less redness, and desquamation of cuticle, and appearance of the canaliculi.

Vesicular.—The vesicular nature of the eruption is always easily recognised and is the commonest eruption in the disease, occurring in the hands as I have said before, in by far the greater number of cases—and as it approaches to its pustular character it is often difficult to diagnose it from eczema—and so it is often overlooked when it occurs about the nipple of the female. The vesicles are often widely spread, large and not pyramidal. I remember a case of a child who had a mixed eruption

of the large vesicles and pustules, the case had been mistaken for small-pox, and had been treated for the same for four weeks by a general practitioner, much to the disturbance of the friends. I found the acarus in a pustule, and the child soon recovered under suitable treatment.

Pustular.—There is no spot on the whole body that may not be the site of pustules or crusts, which are remarkable for their size and nature. They are often single, but may coalesce into one large crust and are seen on the larger joints as in the groin and axilla, extending in front of the abdomen or thighs. In children the soles of the feet and palms of the hands are seen to be often affected. In adults pustular scabies is mostly to be found on the hands, which may become entirely coated with crusts and scabs, and I have seen it very well shown upon the buttocks. The irritation in this variety of the disease is surprisingly small, much less than we might expect under the circumstances; but this form of the disease is easily amenable to treatment, and it leaves stains of a brownish-red appearance similar to those left after impetigo.

Ulcerative.—The ulcerative process is more or less an aggravated form of the pustular variety, especially when the skin is torn by the nails in scratching, and exposed to the action of dirt, it is usually confined to one part of the body, the soles of the feet, or the buttocks. The explanation of this variety seems to be, that as the vesicles are formed and coalesce, the serous exudation increases, and bullæ are formed; these are torn by the nails, and the serum becomes converted into pus and ulcerations, hence (scabies purulentum).

Complications.—We may observe almost every kind of eruption of the skin in conjunction with scabies. Eczema is a very common complication in the latter stages of itch, especially when it is under treatment of sulphur, and usually appears when the skin is very sensitive about the trunk or on the forearm, but it seldom develops to any great extent; if treated with simple soothing remedies will soon depart, but should never be overlooked, as it is likely to be a serious cause of aggravation to the patient. Congenital syphilitic eruptions may also occur with scabies and syphilo-dermata in the

adult. Lichen, lichen urticatus, purpura, and impetigo, may co-exist with scabies; many cases of lichen urticatus are entirely dependant on the irritation that has been set up. It is most important to notice the accompanying symptoms of these diseases, but the history of the disease and its parasite at the commencement, the multiplicity of the character of the eruption, and the evidences of contagion, should never be lost sight of in scabies.

Etiology.—There can be no doubt now that there is only one attributable cause of scabies, and that is: contact with the living acarus, no matter how it is introduced into the skin. Dirt and uncleanness never constitute the primary cause although they may act as the predisposing, and offer a home for the insect and its generative processes. For we may find the itch upon the most cleanly persons who bath daily, in the higher ranks of society.

The acarus itself is a primary cause of but few varieties of the eruptions, *viz*: only those of vesicular and papular character, and these are produced by the young acari. The patient's nails are the cause of all these various manifestations, before mentioned;

for he is driven to scratch by the intolerable itching caused by the acarus penetrating the cuticle, tunneling and hatching its ova under the surface.

It may therefore be demonstrated beyond dispute that the acarus is the origin of scabies. But how does it get to the skin, is it carried about in the vestments of its host, or what? It seems to leave its abode and it will travel at night to seek a new soil; like most of the beetle tribe, it is active at night. Does the season of the year affect them? it is observed at the Hospital of St. Louis that by far the greater number of cases of scabies attend in the winter and it is explained that it is by reason of the poorer classes huddling together in lodging houses, etc. for the sake of warmth. But the sources of contagion must be very numerous. It does not occur to me that it is more prevalent at one time of the year than another. Thus in the number of new cases at the Hospital in January and June 1878 and 1879

1878.				1879.			
Jan.	...	...	42	Jan.	...	...	22
Feb.	...	...	32	Feb.	...	...	25
March	...	...	43	March	...	...	33

1878.				1879.			
April	...	...	23	April	...	...	32
May	...	...	33	May	...	...	19
June	...	...	14	June	...	...	22
July	...	...	17	July	...	...	15
Aug.	...	...	18	Aug.	...	...	19
Sep.	...	...	20	Sep.	...	...	24
Oct.	...	...	24	Oct.	...	...	20
Nov.	...	...	16	Nov.	...	...	24
Dec.	...	...	17	Dec.	...	...	10
296				255			

were 43 and 22 respectively. And the preceding year the results were almost the same. The total numbers we treated during the years 1878—9 were 560 new cases, and analysis has failed to show any marked difference. And with regard to the influence of occupation, butchers seem to obtain the greatest immunity, whilst tailors, general dealers, drapers, and policemen are most often seen to be affected; therefore, those parts of the skin that are most easily got at by the patient affected, are the usual situations that the different varieties before spoken about are most manifest.

Prognosis.—Scabies can always be cured, but it

never subsides spontaneously, and the length of time required to get rid of it depends upon the duration of the disease and the care of the patient. The clothes should be most carefully disinfected, either with sulphur fumigated or with compressed steam, or they should be exposed to a great heat in an oven; for no matter how careful we may be with the treatment, the disease is sure to relapse unless this is done.

The papular eruption is the most contagious of all its varieties, and eczema may be looked upon as its commonest complication.

Treatment.—With regard to the treatment of scabies, the cause being known and recognized at its onset, nothing can be more simple; for any substance that will destroy the acarus will cure the eruption. There are many external agents that have been employed and which are of long standing repute. First of these is sulphur which most effectually accomplishes the desired end, if used with discretion. Then we must get rid of the effects produced; and finally treat the complications, if any.

Now with regard to parasiticides, errors are often made by applying them to the wrong place, and by using them too frequently and too strong.

The great object is to destroy the parasite with the least possible irritation to the skin, and in the event of any complications with other cutaneous or internal diseases to treat them appropriately and according to general principles. Baths and washings are always necessary. A patient under treatment should remain a quarter or half an hour in a warm bath, then apply freely the common yellow soap to every portion of the skin before using it.

A very good treatment, especially with hospital patients, is to order the parts affected to be rubbed twice a day with an ointment composed of levigated sulphur, soft soap and water in equal proportion, and in about 3 to 10 days no trace of the disease should be left. A slight acidulated aperient should be given at the same time. The ordinary sulphur ointment with 3 ij of Peruvian Balsam is as nice a preparation as we can use, and its efficacy is increased with the addition of 3 ½ of Potassa Carb. except in the cases where the skin is unusually sensitive and

delicate. The sulphur vapour bath is also a very effectual method of cure. When rapidity of cure is desired there is no remedy so efficacious as sulphur and lime, (it is usually employed for army itch). Vlemingk's solution, two parts of sulphur and one of quick lime, are boiled together in one part of water; the mixture should be well stirred and when quite combined, poured off and put into a stoppered bottle. It should be painted on the affected parts with a bristle brush, and allowed to dry on and left for 5 to 6 hours, then take the bath. One or two of these applications usually suffices to effect a cure, and this method of treatment is very good in private practice, for scabies is seen in a very different and much less evident form and requires much more modified treatment.

Scabies Norvegica.—This is another variety of scabies seen in Norway, and hence its name *Norwegian scabies*. It occurs amongst the poor, badly nourished, and dirty lower classes of people of that country. It is usually seen in the pustular stage, *i.e.*, large greenish-grey crusts covering red ulcerated surfaces, on the usual sites of the ordinary

disease. Microscopical examination of the crusts shew the acarus and its ova in all stages of development. A similar method of treatment to that employed to the disease in this country will generally effect a cure.

The "*army itch*" is also looked upon as a somewhat distinct disease, but it is merely an aggravated form of scabies, induced by too vigorous treatment and exposure—causing a certain amount of follicular hyperæmia.

One most important point with regard to the treatment of scabies should not be overlooked. The patient should be most careful to see that he does not expose himself to fresh risk of contagion, by sleeping in the same sheets and putting on the same clothes that he wore prior to treatment. The clothes and sheets should be exposed to a very high temperature of 190 F. to 200 F°, or to the influence of compressed steam, or the exposure of sulphur fumigation; otherwise all efforts of treatment will prove of little or no avail.

There are two or three other eruptions which go under the misused name of grocer's, baker's, and

draper's itch, but they are in no way parasitical, and I think should come under the class of eczematous eruptions.

The next parasite of importance is *Acarus folliculorum*, or Pimple mite.

Synonyms: *Demodex folliculorum*.—(Owen).

Steatozoon folliculorum.—(Wilson).

This parasite is associated with a well-known disease of the skin, *viz.*, *Acne punctata*, comedones, or grubbs, as seen in the mild forms of acne of the face of young men and women. The black specks are only the retained sebum or secretion of the sebaceous glands, being coated with dirt at the apex, and the contents of the gland being squeezed out will show sebaceous matter, epithelial cells, and two or more of the acari, and sometimes minute hairs. If inflammation is excited in the follicle, then we have *acne punctata* and *indurata*, but the various forms of this disease are described under its own class,—for there are many forms of acne. This parasite was discovered in 1841 by Heale, and by Gustave Simon in 1842, and mentioned in lectures by Professor Owen in 1843.

Natural History.—The acarus varies in length from $\frac{1}{24}$ to $\frac{1}{135}$ of an inch. The development of the abdomen varies considerably. It has four pair of legs, a vertical slit for the mouth on the under surface of the head, and a ventral aperture. The insect feeds on the secretion of the sebaceous glands, and deposits in them its ova, which pass through various successive changes before natural development is attained. A sebaceous gland may contain three, five, or even twelve of these animalculi. (*See plate*).

Symptoms.—In acne punctata, when it is accompanied with little or no inflammation, this parasite is found, causing very slight inflammation upon the skin in which the secretion is retained, and appears greasy, and is seen upon the nose and chin of young men and women about the age of puberty. At the mouth of the follicle is seen a small black spot, and if the contents of the gland, as I have mentioned above, be allowed to accumulate, induration is set up, and we get various forms of indurated and pustular acne.

Treatment.—The follicles should always be emptied of their contents in the first place, and the constitutional and functional derangements should be attended to and treated accordingly.

Local Applications.—Hot steaming, and fomentations of the face, with washings of warm water and oatmeal and a thorough rubbing of the skin with a rough towel. Many applications have been suggested in the form of ointments and lotions for acne puuctata, but I find that a lotion containing a preparation of sulphur, calamine, and a little spirits of wine, the best application. If there is much induration of the follicle, then the careful application of the acid nitrate of mercury will effect a cure.

3. *The Acarus or Leptus Autumnalis.*—The harvest bug, Erntembele, Germs. This parasite, hitherto undescribed by English authors, is of the spider tribe and character, redish colour, having six legs, two eyes, and two palpi, is not often met with in towns, but in the country is known as the harvest bug, and attacks the skin generally in the lower extremities about the ankles and posterior surfaces of the legs about the autumn or harvest time, but does not live more than two or three days upon the skin.

Symptoms.—A small localized inflammation is set up by the parasite, of an erythematous acneform

character, going on with pustulation, and then gradually subsiding, not generally larger than about half an inch in diameter, but intensely irritable, and caused no doubt by the insertion of the proboscis, and the secretion of its poisonous glands of the insect into the skin. It is sometimes sufficiently irritating as to set up an eruption of acute urticaria.

Treatment.—A spirit lotion containing a little spirits of chloroform, camphor, and two grains of bichloride of mercury, usually allays the irritation and destroys the parasite. The eruption then very soon subsides.

4. *Pulex Penetrans*.—Sand flea or Chigoe, the (*sarcopsylla penetrans*). The sand flea is a common source of disease in South America and the West Indies, and is known as the chiggre; it attacks and burrows into the skin, generally of the hands and feet, between the fingers and toes, or at the sides of the nails, and if it is not extracted before it lays its eggs, it sets up severe inflammation and sometimes gangrene. The insect is seen in its burrow under the surface as a small whitish-brown line, enlarging rapidly as the ova of the insect becomes developed, which they do very soon in large quan-

tities; and which are the chief source of the mischief set up in the skin; the parent dies as soon as it has deposited its eggs.

The treatment consists in removing the insect as quickly as possible bodily, before it has time to lay its eggs, by dilating the channel and then applying soothing applications.

5. *Filaria Medinensis*.—Guinea worm. *Synonyms*: *Dracunculus*, *Peitschenwurm*. The guinea worm disease, is met with in the East, chiefly in Asia, and Africa, and India. It has been met with both in man and horse, and it is due to the presence of a worm which finds its way into the skin. It is said by Dr. Carter that the *filarida* or tank worm from stagnant water, develops itself into the skin, getting into the skin of the feet generally, burrowing deeply; it sometimes grows from $\frac{1}{2}$ to 12 feet in length, and is about 6 months growing, it is about $\frac{7}{8}$ of a line in thickness, and in its course it sets up great irritation: an eruption of large boils is thus caused.

Symptoms.—Great itching is felt in the skin of the part attacked, generally the feet or hands, or the legs; this is followed by the appearance of a small

vesicle, which becomes like a large indurated boil, suppurating and discharging, the worm gradually makes its way out by the head and hangs partly out.

Treatment.—The protruding end of the worm should be seized, and daily a piece wound round some substance, viz., a small piece of wood; any attempt to withdraw it will set up acute inflammation, suppuration, and sometimes mortification; amputation is sometimes resorted to in order to save life. Suppuration should be promoted by soothing poultices. Spontaneous cure is sometimes effected by its own influence. Hardening of the tissues, deposits of calcareous matter, enlargement of glands, and elephantiasis, are sometimes the result of this disease. No doubt there are many other of the dermatozoic tribe of insects which get into the skin and set up eruptions, such as dog ticks, the Persian argos, but those I have mentioned are all the best known to this country.

THE ENTOZOA.

The *Entozoa* or those parasites which live upon the surface of the skin and their accompanying eruptions.

The first disease in this class and the most important, is *Phtheriasis, morbus pedicularis*, or *lousiness*, due to the presence of the parasites.

1. *Pediculus capitis* or head louse (Kopfläuse).
(See plate).

2. *Pediculus corporis* or body louse (Kliëder louse).
(See plate).

3. *Pediculus pubis* or crab or pubic louse (Korfer-order-Fitzläuse). (See plate).

These parasites derive their vitality from the blood of the body, but do not burrow into the skin like the itch insect. Of the three varieties the first and third confine themselves to the hairy portion of the body, the head and pubic; the second, only to the surface of the skin and in the clothing.

The first parasite, *Pediculus capitis*. The symptoms are known by the parasite being seen to be scattered through the hair, which it traverses very quickly. They are found usually on the heads of uncleanly and badly nourished children. They are most abundant about the crown of the head, and we may also see small circular semi-transparent bodies commonly called "nits" attached to the hair at various points. On examination, they are found

to be attached by a pedicle of mucoid matter to the hair, and at the free ends are somewhat cap-shaped. These "nits" excite always more or less inflammation upon the scalp of an essentially impetiginous character, increased by scratching, and accompanied by a musty smell; the hair becomes matted together and numerous crusts are formed at the roots. The neighbouring glands, the post-auricular, and cervical, become much enlarged and eventually suppurate.

There are many diseases of the scalp which favour this parasitic life:—favus, eczema, porrigo, etc. The spontaneous development of the pediculus is a matter on which there is much diversity of opinion, no doubt in persons who have long hair, and allow it to remain long uncombed, and unwashed for some time, the parasites are often seen to abound, but I do not believe in their spontaneous growth.

The pediculus capitis has a long body and is quicker in motion than the crab louse. It has an equal number of legs, and each claw has an additional small claw which furnishes the mucoid secretion before mentioned.

In the female the body is seen to have six segments on each side, with an opening in the centre

of each, posteriorly are two equal projections separated above by the vagina,—in the male this part of the body is round, and above is seen the penis.

The best *treatment* I find is to thoroughly wash the head with soft soap and warm water, and to use a lotion of acetic acid 1—7, and bichloride of mercury gr. ii. ad 3 i., or carbolic oil or parafin 20 per cent., to be well rubbed into the hair.

The *Pediculus corporis*, or body louse, occurs mostly on the bodies of old people and those who are uncleanly, and is generally found upon the neck, shoulders, and chest, sometimes over the whole body.

The symptoms and secondary lesions produced by these pediculi closely resemble those caused by the head louse: they set up *Prurigo*, *i.e.* considerable irritation, the patient scratches himself, hence the origin of excoriations, follicular congestion, eczema, urticaria, pustules, and ulcerations. So great is the multiplication of these parasites, that in six days the female will lay sixty eggs, and in about two months about 18,000 will be hatched. The seat of the eruption is about the neck, shoulders, and chest, in the early stage, and in chronic cases is seen on the body. The characteristic features of the erup-

tion vary as the duration of the disease, the hygienic state and health of the patient, and the scratching he has given way to. The anatomy of this insect and its mode of attack have been very accurately given by Prof. Schjöhdt, in the *Annals of Natural History*, Vol. i., 1866. (*See plate*).

The *diagnosis* is important, and it is readily made. The seat of the eruption, the characteristic hæmorrhagic specks, are sufficient to distinguish it from scabies and other diseases, although scabies and phtheriasis often occur together. The existence of this parasite, in great numbers in old persons, may greatly accelerate a final cause of death, as is sometimes stated, though they are never the actual cause.

No *treatment* is more simple than that of the destruction of this parasite. The patient requires a good warm soap-and-water bath to cleanse the skin, three or four at intervals of two or three days, an inunction of weak Ammonio chloride of mercury ointment gr. 5 ad 3 i., or Staves-acre ointment. Should any irritation follow, then a lotion of calamine and dilute hydrocyanic acid, with an occasional alkaline bath. And last and not the least important, all the clothes worn should be purified and exposed

to a heat of 200 F., as the parasite dwells in the clothes as well as the skin.

The *Pediculus pubis*, or crab louse parasite, is found to infest the hair of the pubis, anus, axillæ, and sometimes even the chest and beards of adults. It exhibits the following signs:—A number of small red spots are seen at the roots of the hair, the hairs are often glued together with secretion, and the little animals are seen. Their attack causes great itching, and follicular congestion, excoriations from scratching, and eczema. The pediculi grasp the hair with such tenacity, that it is difficult to remove them without injury. (*See plate*).

The female is larger than the male. It is found with three pairs of legs, remarkable for their strength.

Treatment.—A few minims of chloroform held for a short time in close proximity will soon destroy them, and they can be easily washed away, and a little mercurial or Staves-acre ointment will always effect a speedy cure.

The *Pulex Iritans*, the common flea. This parasite is often a common source of great irritation to the skin, but quickly subsides. It penetrates deeply with its lance-like proboscis, draws its supply of

blood, and leaves a minute dark speck surrounded by an areola of erythema, quite characteristic of the flea bite, and sufficient to diagnose it from other eruptions.

The *Cimex lectularius*, or bug, (wange), *Acanthia lectularius*. The bug produces hyperæmic papules upon the skin similar in character to urticaria, the papule has a central spot of papule indicating the wound, is flattened at the top, and is of a rose colour. The parts attacked are hot, tender, and irritated more or less in different individuals.

The *application* I find the best for these insects is a little spirit lotion, chloroform and bichloride of mercury, gr. i. ad ʒ i., and the best preventative is the inunction of a little sweet oil well rubbed into the whole body, this is a very effective method of treatment for those dwelling or travelling abroad.

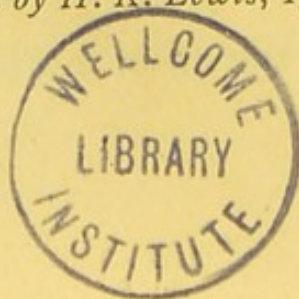
The *Culex pipiens*, or gnat, (Mücke), (Gelse). I have seen set up considerable irritation of the skin, like the bite of a musquito, erythematous bumps. But the irritation caused thereby can be easily allayed by means of a solution of ammon. carb., or alkaline lotion.

The *Æstrus* or bot, or gad-fly, (order diptera). The skin of man as well as the ox or horse may be the

seat of development of the bot, and in South America is often very severely shown. It deposits its larvæ which burrow under the skin, giving rise to severe circumscribed erythematous swellings about the size of a walnut, causing great irritation, and exuding a sanious discharge, sometimes going on to form nasty foul ulcerations. They often require vigorous treatment.

Certain caterpillars, if they get upon the skin, will cause local urticaria by the impaction of small hairs in the folds and crevices of the cutis. The caterpillar commonly called the woolly bear will do this. The eruption can quickly be relieved by the application of a dilute hydrocyanic, and bichloride of mercury lotion.

This concludes the description of all those parasites of which I am aware that attack the skin in this country, setting up those eruptions which I have mentioned, and which prove a great source of annoyance and discomfort to great numbers of the community.



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