

Original Articles.

SOME DANGERS OF INFECTION INCIDENTAL TO PROFESSIONAL LIFE.¹

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I HAVE been consulted within the last ten years by so many physicians on account of diseases they have acquired by contact with patients, that I have thought that it might not be without interest, and perhaps profit, to members of the Society, if I were to present to them in a brief form some of the dangers to which they are thus especially exposed. It is not my intention in this communication to consider what possible relation every disease regarded as contagious or infectious may bear to our subject, but I shall confine my remarks to those affections which are largely, if not wholly, acquired by contact alone. I shall exclude, therefore, all mention of the so-called acute contagious or infectious fevers, the liability and consequences of acquiring which are well understood. It may be well also to state in the beginning that I shall use the terms infection and contagion indifferently throughout this paper. I shall make no attempt to present my subject in any systematic order.

ANIMAL PARASITES.

But little need be said with regard to the danger of acquiring any of the affections of this group. Of the three forms of pediculosis it is the variety *capillitii* only which the physician is liable to take. It is by no means an uncommon occurrence for him to "get lice," as the expression is, in the performance of auscultation, chiefly among the poorer classes in cities, with whom it is extremely prevalent, and to carry it home to his family. It is the wife, however, generally who is the chief sufferer in such cases, for it is in her longer hair that the parasite finds the more favorable conditions for breeding, whilst in the very short hair of the doctor, as now worn, it rarely establishes a permanent seat. I have known not a few such instances in the households of members of this Society.

Scabies is the only other form of animal parasitic disease which the physician is liable to acquire by contact with patients, for although he may often be annoyed by the bites of bugs and fleas, so frequently found in the homes and upon the persons of the poor and dirty, their brief action upon his skin is but a trifling matter. The itch, however, is a much more serious affair, and as it has become a very common affection amongst us in the last few years (sixty-one cases seen at my clinic since October 1st), and as physicians often fail to recognize it, even in the most exaggerated cases when consulted, opportunities for its acquisition by themselves cannot be infrequent. Their exemption under these circumstances (for in my experience such cases of transference are not common, I can recall but one or two) is due, no doubt, to the fact that patients with scabies are handled at the dispensary or consultation-room when their hands and general surface are by exposure at a lower temperature than is conducive to the activity of the parasite, and because contact with the affected parts during a professional examination is necessarily very brief. Transference

of the animal from one person to another is most generally effected, no doubt, by holding the hand for some time, or by longer surface contact with other affected parts of the body in bed, or during impure sexual intercourse. All possibility of such infection can be positively removed by adopting the custom of washing the hands immediately after handling any suspected patient.

VEGETABLE PARASITES.

When I was a young physician I wrote a Boylston essay upon human parasites, and this portion of my subject then comprised only three surface forms of fungus disease. Now we know that the class of vegetable parasites has been greatly enlarged, and includes some of the most important and fatal affections. Those forms were the easily recognized *tinea favosa*, *tinea trichophytina* and *tinea versicolor*. I have known but a single instance of the probable communication of any of these mycoses to the physician by ordinary contact with patients. This was a long continued *tinea trichophytina* of the finger-nails. The other two forms are transferred from person to person with the greatest difficulty, even when inoculation is intentionally practised. All the forms may, I believe, be freely handled and examined with impunity, provided the hands and instruments be immediately and thoroughly washed after contact.

There are two affections as to the contagious character of which there can be no doubt, and which are frequently transferred from animals to man. These are anthrax and equinia.

Anthrax.—The former, or splenic fever of horned cattle, sheep, horses and rabbits, is capable of causing internal general anthrax in man by inhalation of the infectious material, the *bacillus anthracis*, as wool-sorters' disease, without any accompanying cutaneous manifestations, as well as the so-called malignant pustule, by direct inoculation, as seen in butchers, grooms, tanners, skin-dressers, and the like. It is apparent that the veterinary surgeon is also liable to acquire the disease by the care of affected animals, or by post-mortem examinations of the same. It is also evident that the physician may become inoculated by the dissection of patients who have died of the disease, but a question of more general interest is whether he may become infected by contact with its external forms upon man. I find no record of such transference from patient to physician, but I see no improbability in its occurrence.

Equinia.—In glanders also we have a bacillus disease which is readily transferred from horses and asses to man, and from the latter to animals again by inoculation. As it not infrequently affects grooms, so, too, the veterinary surgeon is especially in danger of acquiring it. The virus may also be received by driving behind an affected horse, through contact of the spray from the beast's nostrils with the mouth or eye. In the acute form of farcy in man only about one-third of the cases recover. A few instances are on record where it has been transferred from man to man. It is possible, therefore, that the physician may be inoculated during attendance upon a patient.

Diphtheria is another bacillus disease which has been often transferred with fatal results from patient to physician, generally accomplished by sucking out bits of membrane after tracheotomy. Two members of this Society have become infected during attendance

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upon patients, one fatally, by such direct inoculation. It should not be forgotten that the Klebs-Löffler bacillus may persist in the mouth for ten or more days after the disappearance of the membrane in the throat, and that the vitality of these germs may remain active for months after their removal from an animal basis.

Gonorrhœa. — The dangerous consequences to the eye of the surgeon of contact with the specific discharge in gonorrhœa must not be omitted from this list of infective accidents.

Erysipelas. — With regard to the contagious character of erysipelas diverse opinions prevail, although there is no longer a question as to its parasitic nature. The micrococcus is found in the lymphatic vessels and spaces in all cases, and has repeatedly reproduced the disease after cultivation when inoculated into the healthy skin of man. One understands, therefore, how the affection might be transferred from person to person, from patient to physician. Common belief has it that there is great danger of such communication, an opinion largely held apparently by our profession as well. I do not doubt the possibility of such transference, but I believe that it rarely occurs; I refer to the ordinary superficial forms of the affection. In the great number of cases that I have treated I have not known a single instance in which a second member of the family, a nurse, or medical attendant has become affected. At a meeting of the American Dermatological Association, held a few years ago, during a discussion upon the disease I asked if any of the twenty dermatologists present had personal knowledge of such an occurrence, and but one member could reply that he had observed a case in which such communication seemed to have taken place. Considering the frequency of the disease, we may conclude that erysipelas is contagious in a very feeble degree only. Considering its frequency, we must also conclude that the germs are often at hand to gain entrance through some unprotected point, as the chronic picked or sore nose, sore eyelid, or other abraded and exposed surface. This almost necessary connection with traumatism must largely account for its prevalence in the surgical wards of hospitals. Practically, the physician with a sound epidermis is sufficiently protected against the contagion of erysipelas.

Actinomycosis. — Now that we know that the ray fungus, a streptothrix, — which produces in domestic cattle "wen," "osteosarcoma," "bony sarcoma," and "wooden tongue," in the horse "scirrhus cord," in the pig abscesses in the milk glands and about the pharynx, — is also capable of producing disease in the tissues of man, the alveoli, the tonsils, the glands, lungs, and bones, and that it may be cultivated and thereafter successfully inoculated into rabbits and other animals, we have one more possible source of infection to avoid in the manipulation of disease. Our knowledge of the existence of actinomycosis in man is of too brief duration to furnish the clinical data, by which the reality of such danger may be estimated.

Rhino-scleroma must not be omitted from our list of bacillus and possibly infectious diseases, but it is extremely rare, and, so far as I am cognizant, we have no evidence of its transference from one person to another.

Leprosy, Tuberculosis, Syphilis. — There remain to be considered in their positive relations to our subject three of the most important diseases which affect man, and which are the chief destroyers of the human race. These are leprosy, tuberculosis, and syphilis. The first

two are known to be bacillus affections. The latter has not yet been demonstrated to be such, as the first had not been in 1879, and the second in 1881. Still, the bacillus was present in them all the while previous to these dates, just as I doubt not one has always been, and is in the tissues of every case of syphilis. We shall yet find the proper reagent for its recognition. All three of them are contagious in the sense of being communicable from one person to another under favorable conditions, by contact or inoculation. The question which immediately concerns us is, how far does ordinary professional intercourse between the physician and the patient make such transference possible?

Leprosy. — In a communication made to this Society a year ago, I presented the evidence upon which modern belief in the contagiousness of leprosy is founded. These data, very briefly restated, were: a study of the history of the introduction of the disease into Europe in the twelfth and thirteenth centuries, and its disappearance under stringent laws of segregation; its lingering in force in certain civilized countries under the protective patronage of the doctrine of heredity, and its rapid shrinking from 3,000 to 800 cases in the same regions under a revival of the practice of isolation in the present generation; the enormous spread in our day of the disease on fresh introduction among virgin nations, whose customs and morals especially favor its transference by personal contact; the opportunities afforded of studying its restricted spread along family lines on its recent appearance in certain limited foci in the United States and adjoining British Provinces; and lastly, numerous well authenticated instances of servants, ward-tenders, nurses and priests becoming affected by the disease after prolonged attendance upon hospital lepers. In fact, I do not hesitate to state that we are acquainted with many more cases of leprosy acquired by hospital attendants than with instances of syphilis similarly communicated to nurses and ward-tenders in syphilitic wards. Nor should the successful results of the inoculation of the condemned murderer, by Dr. Arning, in the Hawaiian Islands, although not an absolute demonstration, be forgotten.

The presence of bacilli in all affected tissues, in the secretions and discharges, and the open condition of the numerous cutaneous lesions in leprosy, offer the most favorable conditions for inoculation on the part of the patient throughout the prolonged course of the disease. On the other hand, the protracted period of incubation after inoculation, from one to five years probably, makes the recognition of such instances of direct communication vastly more difficult than in syphilis. If these nurses and ward-tenders and priests may and do become lepers, in consequence of their attendance upon lepers, it is evident that physicians may also acquire the disease by personal contact with patients. Two Hawaiian physicians, not natives, are known to have become affected by it.

But, it may be said, this is a very remote danger to ourselves as practitioners, for leprosy is not a disease of our part of the world. It is true that there are not 250,000 lepers in the United States, as there are in India, and that they do not form a considerable percentage of our population, 1:15, as in the Sandwich Islands, yet the disease has established a foothold in many of our States — in South Carolina, Florida, Louisiana, Texas, California, Oregon, Wisconsin, Minnesota, Dakota, and Utah. Last year there

were certainly six cases in New York City, four in Philadelphia, and two in Boston. These are the cases that have been recognized; they are but a part only, no doubt, of the number that really exist amongst us. Fifteen years ago it was scarcely known that outside of our Scandinavian States there was a leper in the country; now there are one hundred in one town in Florida alone. The disease is bound to increase with all these foci in our midst, if the national government do not take immediate steps for its exclusion by proper immigration laws, and for its segregation within our boundaries, while it yet remains in manageable numbers. Practically, there need be no dread on the part of the physician to handle any case of leprosy in the freest way under a few simple precautions: that the epidermal covering of his hands is intact, that he never allows himself to touch an excoriated lesion or the various discharges of the patient, and that he invariably washes his hands in the most thorough manner after his examination of every case.

Tuberculosis. — I have so lately expressed my views² concerning the unity and contagiousness of the several phases of this disease of many shapes, that I hardly need say more with regard to their recognition and interchangeable nature. In lupus, verruca necrogenica, tuberculosis cutis, and scrofuloderma, as in other forms less commonly well known, we find the same bacillus, the same as in tuberculous disease of other organs, capable of cultivation and of producing one and the same disease in animals on inoculation, from whichever of these clinical forms it is taken. Conclusive evidence has been collected moreover that one form may produce the same or another when inoculated or transferred from one tissue to another tissue of the same person, or to the tissues of a second person. The common nature and the common danger of all forms of tuberculosis having been established, the question which especially concerns us now is in what way and in what form is the disease most likely to be communicated to the physician or surgeon. We know the possible dangers incident to the inhalation of the air of wards for consumptives up to the recent date of our knowledge concerning the nature of sputa in that disease, and those connected with auscultation and other forms of close contact with contaminated garments and the patient's exhalations. There are other channels of infection not so generally appreciated.

The verruca necrogenica, or anatomical tubercle, has long been known as affecting the fingers of dissectors and autopsy-makers, but it is only within a few years that its tuberculous nature has been known. Lately a much more extensive verrucous affection of the integument has become recognized also as a true cutaneous tuberculosis, and entitled tuberculosis verrucosa. Both forms contain the tubercle bacillus, and are in fact anatomically identical in all respects. The first named clinical form is undoubtedly acquired in the dissecting and necropsy rooms by contact with tuberculous tissues of the cadaver. The latter, much more extensive and sometimes multiple, is often acquired, I believe, by contact with phthisical sputa and open scrofulous glands. I have seen it repeatedly upon the hands of consumptives, and those in attendance upon them and patients with scrofulous ulcers. One may therefore acquire cutaneous forms of tuberculosis by making dissections and autopsies, by examinations of all external forms of the disease, by surgical opera-

tions upon "scrofulous" gland, bone and joint disease, and by contact with phthisical sputa. That cases of inoculation among physicians, considering the great prevalence of these many forms of the disease, are not more common, may be attributed to the protective nature of a sound epidermis. That none of us may surely escape such danger will be apparent to you, when I state that two members of this body have thus acquired tuberculosis verrucosa, and I have treated several students with verruca necrogenica. It is indeed fortunate that such forms of the disease tend to remain strictly localized cutaneous processes for indefinite periods, and not to become foci for dissemination of the bacillus to internal vital organs, as do the softening varieties, lupus and scrofuloderma, in so large a percentage of cases.

Syphilis. — This is an affection, with the appearances of which the practitioner is presumed to be familiar, and with the dangerously infective properties of which he is fully acquainted. It might be supposed, therefore, that, being constantly upon his guard, it would be a rare occurrence that he should become infected through patients. Unfortunately the reverse is the case. This may be due to lack of proper knowledge of all the manifestations of this protean disease, to inattention to the necessary precautions in handling cases, or to the masked or concealed lesions with which he may come in contact during surgical or obstetrical manipulations. Certain it is that for one or all of these reasons physicians often become inoculated with syphilitic virus through their own hands. Another unfortunate feature in the history of these cases is that they rarely recognize the real character of the early lesion upon themselves, accepting every possible and often impossible diagnosis as to its nature, before the correct one is forced upon them. They, too, are apparently blinded by the commonly received opinion that syphilis is necessarily a venereal disease, and therefore disregard the liability of contracting it through extra-venereal channels, and the dangers of contact with other than genital lesions. Accordingly the digital primary lesion is generally regarded as a felon, a septic sore, a local tuberculosis, or even a malignant process at first, or until a perfectly defined syphiloderm, or other signs of general infection, make clear the nature of the former. I have seen all these mistakes made, and, when the later constitutional symptoms were slight or fugitive in character, have seen the erroneous diagnosis persisted in for months, in one instance until amputation was seriously considered by patient and surgeon as the only possible means of relief. It is astonishing how wide and deep may be the tissue changes in the integument, which in time develop around the primary inoculation in some such cases. In the beginning, however, the earliest manifestations may be of the most insignificant and apparently trivial character. The primary lesion of syphilis is by no means necessarily the expected standard chancre, it may be a small papule, an excoriation, or an ulcer of very misleading appearance. It is not, however, my intention even to touch upon the diagnostic features of any of the affections we are considering. I have notes of fifteen cases of syphilis in physicians, and I have seen and known of others, who were inoculated upon the hands during the discharge of their professional duties. The seat of the primary lesion was determined in the majority of them by inspection, in the remainder by data obtained from the

² Boston Medical and Surgical Journal, November 12, 1891.

victims. They were mostly severe cases, perhaps because, for reasons above given, the diagnosis was made late and, therefore, treatment was begun late, perhaps because there is truth in the common saying that physicians make bad patients, and treatment under the divided responsibility of the consultant and sufferer was negligently conducted. I know no disease which demands so absolute and constant a surrender of the patient's will to the control of the physician as syphilis. Three of these unfortunates, possibly more, died of the disease. All of them suffered greatly in mind, and were more or less physically disabled or disfigured for a time. Some of them might readily have communicated the disease to their own households or to patients, before the nature of the digital affection was recognized. I once treated a midwife with an open primary lesion upon her finger. I found that she had delivered thirty-two women whilst the sore was in this condition. How many of these lying-in women, or of the infants handled by her may she not have infected? Yet I believe that every case of syphilis may be handled as thoroughly as the needs of diagnosis demand. The sound epidermis is a safe shield against the reception of the virus as a rule, no doubt, but the hang-nail, or the slight fissure, or excoriation forms the fatal point of entrance.

Two practical lessons have enforced themselves upon me from my experience in this relation: First, always to wash one's hands immediately after an interview with a patient who has, or is suspected to have syphilis, without regard to the condition of the parts handled, or even if not touched at all. This should be made an invariable custom. Second, that the physician should regard every persistent sore upon himself of whatever seat and however innocent apparently, as a possible lesion of tuberculosis or syphilis, and seek competent advice without delay. Such advice is never found at home.

I have thus briefly, and very inadequately, I am aware, called your attention to some of the dangers to which the physician is liable in his daily work. The agents of all the evils we have been considering are among the most minute and lowest forms of organized life. In spite of recent disappointments in the resources of pure science applied to this end by the most eminent masters, let us not forget that one most destructive pest was long ago robbed of power over mankind by the keen observation alone of a plain country physician, and trust that, in the one way or the other, some day these affections, we have been considering, may likewise be rendered innocuous to us and all men by the protective action of some beneficent influence.

WHAT IS A "FELON?"¹

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As a member of the Suffolk Board of Censors I have asked the above question of many applicants for admission to the Massachusetts Medical Society, and have received answers which have convinced me that the term "felon" is loosely applied. A search in the common text-books on surgery shows, as a rule, the neglect to clinically differentiate the inflammatory diseases of the finger.

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There can be no question of the difference between a simple "run-round," which, although troublesome, is rarely dangerous, and that serious, destructive supuration which destroys not alone the usefulness of the finger and hand, but occasionally ends fatally. Yet the distinction in name, at least, is frequently not made. I feel sure that most practitioners distinguish various affections of the fingers; and in this paper I shall place before you a classification that I have used in my work, which has enabled me to meet these cases with a greater sense of accuracy. It is an anatomical classification, and is as follows:

- (1) Dermatitis.
- (2) Paronychia.
- (3) Cellulitis of the finger.
- (4) Suppurative thecitis.
- (5) Periosteitis, or osteitis of the phalanges.

I believe that it will be granted by all that it will be of value to differentiate these several affections, and, as a matter of fact, I have found it possible to do so in my clinical work. Whether I shall succeed in placing their clinical histories before you will be a matter of which you alone can judge.

I. DERMATITIS.

In a dermatitis, we have a clinical history somewhat as follows: Usually the starting-point is some slight abrasion of the cuticle covering the end of the finger, and from this point there starts a reddened area with slight elevation of the skin, with a stinging, smarting pain, which is not intense enough to prevent sleep. The finger when held dependent is more painful than when supported. This red, slightly elevated area involves both the epidermis and the derma. Vesicles form from point to point, these become pustules, and the dermal inflammation which extends is temporarily checked at the different flexures of the fingers until it involves the whole finger, and occasionally spreads on to the palm or dorsum of the hand. Copper workers, zinc workers and paper-box workmen are particularly apt to have this trouble. It is purely a local affection, and is self-limited when the cause is removed. Its treatment may be carried out by the application of any one of the astringent lotions like liq. plumb., subacet., or, what is preferable, a 1-20000 solution of corrosive sublimate. This, in the course of forty-eight to sixty hours, will check the dermal inflammation, as a rule, and then exfoliation of the skin of the finger will occur.

II. PARONYCHIA.

This is a form of inflammation which occurs in the structures lying at the root of a nail, and it may appear when any crack has occurred in the skin overlying the luna of the nail. Usually a smarting, stinging, or throbbing pain exists for a few hours, definitely localized in a tender, reddened area at the point of infection; for I believe that usually this is the result of inoculation. (House-surgeons used to be particularly liable to this affection, but of late years have had less trouble). At the end of one or two days there is usually a small area of pus, and at this time by appropriate surgical interference a great deal of trouble can be averted. If, on the other hand, this is neglected the pus is retained by the tense band of the union of the derma at this point, and passes downward to the matrix of the nail, and then begins to burrow beneath the nail. This occurs at the end of four or five days,