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INFECTIOUS DISEASES AS VULNERATING FORCES UNDER WORKMEN'S COMPENSATION ACTS

KURT GARVE *

*Pattiani v. State Industrial Accident Commission et al.*¹ was a case in which the employee was sent by his employers upon a business trip, in the course of which he was to visit a number of eastern cities for the purpose of investigating, and negotiating for, the purchase of equipment to be used by his employers. In pursuance of his instructions he left San Francisco, the place of his business, calling on dealers in different cities. He finally landed in New York, from where he returned a month later to the place of his employment. While homebound he found himself ill and continued to be so until his arrival in San Francisco where he sought medical aid. It was detected that he was suffering from typhoid fever. He brought proceedings under the Workmen's Compensation Act claiming to have contracted his disease while in New York. The Commission found that at the time of claimant's trip and visit in New York there was prevalent in that locality an epidemic of typhoid fever, that claimant had eaten oysters thereat, but that the evidence did not establish as a fact that said epidemic was caused or aggravated by contaminated oysters, and that the fact that applicant was required by his employment to visit or to sojourn in that locality where there was an epidemic of typhoid fever did not constitute a special exposure arising out of the employment and was not peculiar to, or characteristic of, his occupation. From an order of the Commission denying compensation the employee appealed. Order affirmed.

It might be that the Commission could have decided the case the other way if it had thought of a few medical facts of common knowledge, deducted therefrom certain inferences and applied them to the facts of the case. When and under what circumstances, if at all, are contagious and other infectious diseases industrial vulnerating forces within the meaning of workmen's compensation acts?

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¹199 Cal. 596, 250 Pac. 864 (1926), rehearing denied with modification.

A causal connection between employment and infection is necessary to lay the foundation for compensability due to disability or death resulting from infectious diseases. However, the term "infectious disease" is a compound concept, consisting of :

- (a.) an invasion of pathogenic germs;
- (b.) a sufficient virulence thereof to overcome the defensive forces of the host after the invasion so that an infection results;
- (c.) a disability or death by reason of such an infection without the intervention of an independent agency.

This article will deal only with the first and second elements of infections.

CAUSAL CONNECTION BETWEEN EMPLOYMENT AND INVASION OF GERMS

That infectious diseases may develop outside of the employment, as well as by reason thereof, permits of no argument. Where, therefore, the invasion of micro-organisms into the body of the employee is incidental to some bodily process, both natural and normal, their attack presents itself to the mind as a disease and not as an accident due to the employment within the meaning of workmen's compensation acts. "Our mental attitude is different when the channel of infection is abnormal or traumatic, a lesion or cut. If these become dangerous or deadly by contact with infected matter we think and speak of what has happened as something catastrophic or extraordinary, a mishap or an accident."² It is the abnormal inoculation of the human body which is the underlying ground for litigation, adjudication and compensation by commissions and courts. Where an industrial tool, loaded with germs of sufficient virulence to cause an infection, pierces the employee's integument by reason of his work, and an infection ensues, a causal connection between employment and infection is established. Thus, in *Calderera et al. v. P. Nathan & Co. et al.*,³ the evidence was held sufficient to sustain an award when it was found that the employee, while working, stepped on a tack, causing a wound which became infected and led to blood poisoning resulting in death. In a Minnesota case⁴ an order of the commission granting death benefits to deceased's dependents was upheld by the higher court upon showing that the workman, while unloading bags from box cars, received a scratch on one of his hands resulting in blood poisoning from which he died and, where there was testimony that men engaged in that line of work often receive scratches on their hands, sometimes from nails inside the cars. In *Bagley's Case*⁵ it was held

²Connelly v. Hunt Furniture Co., 240 N. Y. 83, 147 N. E. 366 (1925).

³200 App. Div. 298, 192 N. Y. S. 737 (1922).

⁴State ex. rel. Albert Dickinson Co. et al. v. District Court, Hennepin County et al., 139 Minn. 30, 165 N. W. 478 (1917).

⁵256 Mass. 593, 152 N. E. 882 (1926).

that death of an aged watchman from erysipelas following a fall on the dirty floor of defendant company's premises and in the course of his employment constituted an accident arising out of the employment, when a medical expert testified that "decedent got his infection when he fell on the dirty floor and that that was a typical case of what would cause erysipelas". But an abnormal inoculation may take place in a manner other than the penetration by germs of an open wound caused by an industrial instrumentality. There may have been an open wound prior to the employment, and the latter may have furnished only a contact with micro-organisms, resulting in disability or death. Prima facie, there is an aggravation of a pre-existing infirmity. Compensation has been awarded under such circumstances. In *Janiosowski v. Industrial Commission of Ohio*⁶ the infection of a cold sore was caused by rubbing the face with the hands while handling carbon paper. This was held to constitute an injury within the meaning of the Workmen's Compensation Act. Infected water has been held to be an industrial vulnerating force enabling invasion of germs. In *Monson v. Batelle*⁷ petitioner, afflicted with an old wound, was forced to wade through flood water which had overflowed defendant's premises, in consequence of which the wound became infected requiring amputation of the foot. In *Horrigan v. Post-Standard Co.*⁸ the employee cut his finger while at home. The next day, while cleaning a urinal in due performance of his duties, he put his hand into the water, the hand became infected through the cut, resulting in death two weeks later from blood poisoning. In both cases compensation was allowed. An aggravation of a pre-existing infirmity may also be found in cases in which the employee, by reason of his work, contracts blisters or callosities, which break open, causing an infection. In *Scoville v. Tolhurst Machine Works et al.*⁹ the workman was engaged in making metal brushes, necessitating a constant pressure with the hand. A blister developed on the palm of his hand. It broke and blood oozed out of the crack in the flesh. It was held that the ensuing infection thereof constituted an injury due to the employment. In an Illinois case¹⁰ the servant's work required her to hold cloth taut and straight as it passed over a roller. This caused a blister on her thumb which broke, and thereafter the thumb became infected. It was held that the injury was traceable to her work, and that the infection presumably occurred on the employer's premises. The Supreme Court of Tennessee held that infection following the formation of a callosity upon the workman's finger tip which, in turn, was caused by the

⁶22 Ohio App. 112, 153 N. E. 247 (1926) 1st appeal; 25 Ohio App. 319, 158 N. E. 195 (1927) 3rd appeal.

⁷102 Kan. 208, 170 Pac. 801 (1918), rehearing denied.

⁸224 N. Y. 620, 121 N. E. 872 (1918).

⁹193 App. Div. 606, 184 N. Y. S. 608 (1920).

¹⁰*Western Shade Cloth Co. v. Industrial Commission et al.*, 308 Ill. 554, 140 N. E. 45 (1923).

operation of one of defendant's machines, was an accidental injury, the court distinguishing between a mere callus, and the appearance of an infection therefrom.¹¹ A felon, however, has been held in Michigan¹² and New York¹³ not to have been caused by a compensable accident, where it was shown that it developed from the continuous use of a pair of pliers, or resulted from pressing a screwdriver constantly with the palm of the hand. The decisions of these two cases rest upon the somewhat stricter and more narrow interpretation of the term "accident", as used in the respective workmen's compensation acts of these jurisdictions. Is vaccination against small-pox, when resulting in infection and injury to the employee compensable under workmen's compensation acts? Where the infection has been clearly contracted by reason of the employment, compensation ought to be awarded. But, it seems that the proof in such cases must be more convincing than in other ones. Per se vaccination is not incidental to the employee's occupation. Usually in times of epidemics the Health Department approaches the employers with the request of cooperation or on grounds of sanitation legislation. Public welfare is at stake, and public policy should favor non-compensability in all but obvious cases of causal connection between the ensuing infection and employment. The outcome of litigation by reason of infected vaccination wounds is, therefore, prima facie unfavorable to the employee. Much depends upon the type of germs which have invaded the employee's vaccination wound. Where the germs are ubiquitous, the proof usually fails. In *Jefferson Printing Co. v. Industrial Commission et al.*¹⁴ the employee was vaccinated. He contracted erysipelas, wherefrom he died. In reversing an award in favor of his dependents the Supreme Court of Illinois said: "The vaccination was not an incident of the employment, and there was nothing shown to indicate that the prevalence of erysipelas germs or their liability to enter the bodies of plaintiff in error's employees was occasioned by anything in the nature or the place of the employment and was not an added risk incidental to Lasseter's employment. * * * * The testimony in the record showed that the streptococcus germ is carried in the air everywhere, so that there was apparently no greater liability to infection one place than another." In *Krout v. J. L. Hudson Co. et al.*¹⁵ an award in favor of the employee was also set aside by the Supreme Court of Michigan, the court remarking that there was nothing in the employee's work which made her more susceptible to the reception of germ infection than if she were walking upon the street or attending a theater or church, and that the risk was only such to which the general public is exposed.

¹¹*Sears-Roebuck & Co. v. Starnes*, 160 Tenn. 504, 26 S. W. (2) 128 (1930).

¹²*Perkins v. Jackson Cushion Spring Co.*, 206 Mich 98, 172 N. W. 374 (1919).

¹³*Woodruff v. Howes Construction Co.*, 228 N. Y. 276, 127 N. E. 270 (1920).

¹⁴312 Ill. 575, 144 N. E. 356 (1924).

¹⁵200 Mich. 287, 166 N. W. 848 (1918)

There are certain occupations which suggest at first blush causal connection between infection and employment. The place of employment, or the materials handled therein by the workman, are veritable breeding places of micro-organisms, often of highest virulence. Embalmers, for instance, are exposed to the risks of infection from handling corpses and instruments used thereon. In *Connelly v. Hunt Furniture Co. et al.*¹⁶ an embalmer's helper handled a corpse while in the line of his duties. The corpse by reason of the amputation of a leg—thus indicating blood poisoning—had become greatly decayed and was full of gangrenous matter. Some of it entered a little cut in the employee's hand and later spread to his neck, when he scratched a pimple with the infected finger. General blood poisoning set in causing his death. It was held that he died from a compensable injury. Where the species of micro-organisms found in the body of the employee, identified as to their strain, dovetail with those in the matter handled by him, the inference of causal connection becomes almost overwhelmingly favorable to the employee. In *Blaess v. Dolph et al.*¹⁷ a woman had died from a streptococcus infection. The employee, an undertaker's assistant, had handled and sterilized the sharp-edged instruments after their use in embalming the woman's body. Within 36 hours thereafter he began to suffer from a streptococcal infection too, so that he died. An award in favor of his dependents was affirmed. The undertakers' cases bring up another type of infections of very similar character. The germs are highly specific. Generally, they are found to be present in or on certain animal matter or in certain localities occupied by trades having to deal with animal matters. It is significant that anthrax, for instance, is called in popular medical terminology: "woolsorters' disease",¹⁸ a fact of which commissions and courts might well take notice. Also, scientific medical books and treatises abound with statements pointing a finger of strong accusation to certain trades so that in a purely medical sense these diseases may well be called vocational diseases.¹⁹ In *McCauley v. Imperial Woolen Co. et al.*²⁰ the court on appeal and the commission took judicial notice that "anthrax is primarily a disease of animals, such as sheep, which may be transmitted to men when handling infected animal materials, like wool". The referee's conclusion that the employee, a woolsorter, had received a scratch on his neck in the course of his employment, that anthrax germs entered his body causing death, and that he died as a result of injury due to the employment was up-

¹⁶240 N. Y. 83, 147 N. E. 366 (1925), see note 2.

¹⁷195 Mich. 137, 161 N. W. 885 (1917).

¹⁸"Diseases of the Skin", Stelwagon & Gaskill, 9th ed., p. 417, W. B. Saunders Company, Philadelphia and London.

¹⁹"Diseases of the Skin", Stelwagon & Gaskill, 9th ed., p. 418; "Diseases of the Skin", Hazen, 3rd ed., p. 167; "Diseases of the Skin", Sutton, 7th ed., p. 376-78, claiming that anthrax bacillus may be found on apparently healthy animals.

²⁰261 Pa. 312, 104 Atl. 617 (1918), see syllabus 14.

held. In *Hiers v. John A. Hull & Co.*²¹ the servant was engaged in weighing hides on the piers of Brooklyn. Previous to the day of his alleged infection with anthrax, while doing the same kind of work, wet salt had permeated his gloves and caused a swelling of his hand and an abrasion or fissure. On the day mentioned he handled dirty and infected hides, and anthrax germs contained therein were communicated to him, causing his infection and death. Here, too, compensation was awarded. Where an employee died from an infection of the liver caused by the actinomyces germ, which produces "lumpy jaw" when it affects cattle, it was held that there was compensable injury where it was shown that decedent had handled hides and trimmed off remnants of flesh therefrom which had not been removed by previous machinery processes.²² In *Hartford Accident & Indemnity Co. v. Hay*²³ the Supreme Court of Tennessee upheld an award in favor of the employee, a laundry wagon driver, who suffered a blastomycetic infection from handling his horse in and around defendant company's stables, upon the commission's finding that the disease is common in horses, and germs would breed in a dark and damp place such as a stable. In *Eldridge v. Endicott, Johnson & Co. et al.*²⁴ the Court of Appeals of New York reversed an award in favor of the petitioner and remanded the claim to the commission for rehearing. It appeared that the employee had died from anthrax allegedly contracted while working in defendant's tannery about hides. Decedent, prior to the day of the asserted infection, had been cut in the neck while being shaved by the barber of the village where the tannery was situated. A pimple appeared after the cut had healed over. The wife pricked the pimple with a needle, applied a poultice of sugar and soap and covered it with a cloth around the neck. At that time the neck was not swollen. The following morning the employee went to work and returned at night, his neck now being swollen. Three days later he died from anthrax. Decedent's work consisted in counting hides from southern Mexico and South American countries. The higher court held that the commission was not warranted in taking judicial notice of or in presuming that hides such as those in question usually or frequently contain anthrax germs, nor that a person working about them with an open wound is likely to receive the germs and die from anthrax. Further, it held that there was no evidence as to whether the hides in question had anthrax germs, or as to the manner in which anthrax bacteria may be transmitted to men. Is such a view justified? "According to Prosser White the infection is usually conveyed by the agency of dust in work, and persons engaged in handling hides and skins

²¹178 App. Div. 350, 164 N. Y. S. 767 (1917).

²²*Pfister & Vogel Leather Co. v. Industrial Commission of Wisconsin et al.*, 194 Wis. 131, 215 N. W. 815 (1927).

²³159 Tenn. 202, 17 S. W. (2) 904 (1929).

²⁴189 App. Div. 53, 177 N. Y. S. 863 (1919), reversed by 228 N. Y. 21, 126 N. E. 254 (1920).

are most frequent victims of the disease".²⁵ In *Stellwagon and Gaskill*,²⁶ this medical observation is confirmed. "In man the disease is met with in those who have to do with cattle, and those who have to work in their products, such as slaughterers, tanners, wool-sorters, etc. Ravenel reports an outbreak in which as many as 12 men and 60 head of cattle died near tanneries in Pennsylvania in the course of a year. The men were operatives at the tanneries, while the cattle were on pastures watered by the streams carrying off the refuse from these tanneries. Goldschmidt and Merkel have reported cases occurring among employees of brush factories". So far everything seems to be in favor of the claimant and the commission. But the authors continue: "During the Great War there were numerous cases of anthrax reported as occurring in the different cantonments of base hospitals. Various causes were assigned but the shaving brush was held responsible in most of the cases, although one factor was very frequently overlooked. The camps were located on farm lands which had been used in several instances for sheep pastures, and there is no doubt that the extremely resistant spores blown up on the drill grounds were equally, if not more often, responsible than the shaving brush".²⁷ It is not impossible that the deceased had picked up his infection in the barbershop as well as in the tannery. The dressing around the neck might possibly have protected him against contact with the anthrax germs while at work. But this seems to be rather problematic. On the other hand, why should it be mere coincidence that the swelling on the neck appeared after the employee had come in contact with hides from tropical countries? Viewed in the light of post-war medical science the decision of the New York court remanding the case for further consideration by the commission can hardly be attacked as unfair to the employee, even though the suspicion is strong that he, in fact, contracted the disease by reason of his employment. The Supreme Court of Pennsylvania seems to have taken a somewhat more liberal view in the *McCauley* case,²⁸ which is, however, by no means on all fours with the *Eldridge* case.

ARE VISIBLY OPEN WOUNDS NECESSARY TO PROVE INVASION OF MICRO-ORGANISMS?

In order to prove invasion of micro-organisms is it necessary that there be a wound, visibly open? This question is likely to arise in connection with infections following contusions and discolorations of the skin due to some external violence. In *Unkovich et al. v. Inter State Iron Co.*²⁹ the employee,

²⁵"Diseases of the Skin", Sutton p. 376, see note 19.

²⁶"Diseases of the Skin", *Stellwagon & Gaskill*, p. 418, see note 18.

²⁷*ibidem*.

²⁸261 Pa. 312, 104 Atl. 617 (1918), see note 20.

²⁹169 Minn. 491, 211 N. W. 683 (1927).

while carrying a post, slipped and fell, the post striking his leg above the ankle, causing a contusion and discoloration. Thereafter blood poisoning set in. It was defendant company's contention that, if there was an injury, it was not sufficiently serious to permit the invasion of germs and the infection because the blow did not cause an open wound. A medical expert testified practically to the same effect saying that without some evidence of injury to the skin no germs would be likely to enter. But, just because the skin does not show any visible, or otherwise perceptible, severance of its superficial tissues some time after the blow has been received, is no proof that there was no such cleavage in fact, and that germs did not enter. The naked human eye is no microscope. It cannot ascertain whether or not there is a gap sufficiently large to permit access to the interior of the body to germs of a size so small that it takes high-powered optical instruments to see them. Furthermore, the skin is elastic so that after an instantaneous invasion of germs the temporarily existing, minute, open wound is quickly closed again, even without loss of one drop of blood. Who can say with any degree of certainty that there has not been a cleavage of the skin permitting invasion of germs where there is a contusion or discoloration? It seems that the odds are against positiveness of such statements. In *Cockrell v. Industrial Commission et al.*³⁰ the Supreme Court of Illinois makes the rather terse statement: "There is evidence that septicemia is an infection of the blood; that it is possible for the germ to enter an opening in the skin so small that it could not be seen with the naked eye; * * * * ." In *Caldwell v. State Compensation Commissioner*,³¹ the Supreme Court of Appeals of West Virginia upheld an award in favor of the claimant, even though it did find that there was not any reference in some standard medical works "to a bruise as causing or as fomenting an abscess in the tissues of the body". In *Buhse v. Whitehead & Kales Iron Works*³² the medical testimony on this point was indefinite. In *Antonew v. N. W. States Portland Cement Co.*³³ the doctor testified that an abscess could have been caused by a contusion or compression of the hand, and that "if a man does severely bruise his hand, he might have an abscess and he might not." In the *Unkovich* case³⁴ the doctors did not think that the bruise caused the employee's infection. One of the doctors, however, confessed that he could not say "where the original infection came from". In some of these cases a justification for denying causal connection between contusion, or other similar injury of the skin, and invasion of germs may easily be found from other circumstances. Thus, where the employee fell from a pile of lumber and abscesses on both knees developed about three weeks after the accident.

³⁰327 Ill. 438, 158 N. E. 673 (1927), rehearing denied.

³¹106 W. Va. 14, 144 S. E. 568 (1928).

³²194 Mich. 413, 160 N. W. 557 (1916), (testimony of Dr. Edwards).

³³204 Iowa 1001, 216 N. W. 695 (1927).

³⁴169 Minn. 491, 211 N. W. 683 (1927), see note 29.

the applicant having meanwhile engaged in his usual occupation, and where there was medical expert testimony that the injuries due to the fall had been only slight and had not been sufficient to contribute to the formation of the abscesses, compensation was denied.³⁵ It would seem that the lapse of time between the injury and the following infection warrants such a conclusion, although the incubation period of some infections may account for the long delay of the first signs of the outbreak of the infectious disease after the invasion of the micro-organisms, as in the *Pattiani* case.

THE CONTAGIOUS DISEASES

So far, infections due to invasion of micro-organisms by reason of wounds of the integument have been discussed. There are other avenues of the body along which germs may enter the human body: by way of the intestinal or respiratory tracts. In these cases it is by far more difficult to establish causal connection between employment and disease resulting therefrom. This applies particularly to those cases in which contagious diseases are involved. In *Dehn v. Kitchen et al.*³⁶ claimant had died from sleeping sickness. The Commission denied compensation and the next higher court had granted an award in favor of deceased's dependents only to be reversed, in turn, by the Supreme Court of North Dakota. There was testimony indicating that decedent had been engaged in remodeling a cafe, and that the condition found there was what it "usually is when you come to take out old woodwork in a hotel or restaurant". It was, however, noticed by the employer, who was a witness, that much insect powder had been used and that mice and rats had visited the place. The premises were so dusty that it was difficult to distinguish faces or features except at close range. The decedent had been apparently well up to the time when he went on this job. The medical testimony tended to prove that the genesis and source of the disease is unknown. We may compare this case with *Dove v. Alpena Hide and Leather Co.*³⁷ in which death of a tannery worker was held to have arisen out of the employment when it was found that dust arose from the handling of the hides, that the ventilation was poor, that dust arising from the hides contained septic germs which had entered the employee's body through the respiratory organs and first found lodgment in his throat. There was medical testimony that all dead animal matter contains infectious germs and that hides, being such substance, are no exception to this rule.

Similarly difficult are the cases in which the invading germs have gained entrance into the employee's body by way of the digestive tract. Where the employer supplies the workmen with drinking water at their place of work

³⁵*Nelson v. Industrial Accident Commission et al.*, 55 Cal. App. 681, 204 Pac. 23 (1921).

³⁶54 N. D. 199, 209 N. W. 364 (1926).

³⁷198 Mich. 132, 164 N. W. 253 (1917).

and while in the line of their duties, many courts have held that the contracting of typhoid fever, for instance, by the servant constitutes a compensable accident or injury. Thus, in *Frankamp v. Fordney Hotel et al.*³⁸ the Michigan Supreme Court held that the contraction of typhoid fever by a hotel waitress from drinking water furnished by the hotel was an accident within the meaning of the Michigan Workmen's Compensation Act. The same result was reached in *Wasmuth-Endicott Co. v. Karst*³⁹ by the Appellate Court of Indiana. In *Brodin's Case*⁴⁰ the Supreme Judicial Court of Maine held it to be a "personal injury by accident". Ohio and Minnesota seem to have held in the past that typhoid fever is not an accident within the meaning of their respective compensation acts, as evidenced by *Industrial Commission v. Cross et al.*,⁴¹ and *State ex rel. Faribault Woolen Mills Co. et al. v. District Court, Rice County et al.*⁴² In the Minnesota case it was said that "it requires more than a week after the infection for the disease to develop sufficiently for its symptoms to be discernible", and that, therefore, the disease does not result from an event which produces injury to the physical structure of the body at the time it happens. True enough, the disease does not develop immediately into its full clinical picture. But, a perusal of any medical book will show that there is an incubation period with certain prodromata such as languor, disinclination to exertion, headache, pain in the limbs, etc., although it may be granted that during this period some patients may feel perfectly well.⁴³ It must also be conceded that the typhoid bacilli need a certain amount of time to increase in number sufficiently to cause the clinical picture. But the inoculation is a sudden and violent act, and with the inoculation the chain of events starts toward the full picture of disability or even death.

It would seem that the Michigan, Maine, and other courts have the better reasoning on their side. Sometimes an examination of the water from the alleged sources of infection will not reveal the specific micro-organisms responsible for the disease. In *John Rissmann & Sons v. Industrial Commission et al.*⁴⁴ the germs found in the polluted water were colon bacilli, and not typhoid bacilli. And yet, compensation was awarded to the claimant who had come down with typhoid fever. How is such a piece of evidence compatible with the alleged infection? Firstly, as the water contained some germs indicative of pollution, strong suspicion is cast upon its purity. If it contains one type of germs, it is not unlikely that it also may contain the other

³⁸222 Mich. 525, 193 N. W. 204 (1923).

³⁹77 Ind. App. 279, 133 N. E. 609 (1922).

⁴⁰124 Me. 162, 126 Atl. 829 (1924).

⁴¹104 Ohio St. 561, 136 N. E. 283 (1922).

⁴²138 Minn. 213, 164 N. W. 810 (1917).

⁴³"A Text-Book of Medicine", Adolf Struempell, 4th American ed., p. 5, vol. 1, D. Appleton and Company, London and New York.

⁴⁴323 Ill. 459, 154 N. E. 203 (1926), rehearing denied.

kind. It should be remembered, further, that germs, although of decidedly different strains, may under certain circumstances resemble one another in their morphology, habits, and clinical effects so that it becomes exceedingly difficult to distinguish one form from the other one, provided the different strains belong to the same general class. In bacteriology the question of "mutation" may become of vital importance in such cases. "It is becoming more and more recognized as our knowledge of pathogenic bacteria advances that around each particular type form we must group a number of variants which closely resemble it. This is specially true of some of the members of the coli-typhoid group; * * * *."⁴⁵ In the *Rissmann* case there was also evidence that other workers of the employer, supplied with the same water, had contracted typhoid fever or para-typhoid, a disease closely allied with typhoid fever.

Where, however, the employer does not furnish any contaminated water, nor, in fact, furnish any water in connection with the work, nor is aware of any source of infection in the reasonably immediate neighborhood of the place of work so as to be able to warn his employees, he is not liable for their contracting an infectious disease. Thus, it seems that where the source of infection is not at or in view of the place of work, but some distance therefrom, no causal connection between employment and infection is to be found. In *Ames v. Lake Independence Lumber Co.*⁴⁶ this rule has been suggested apparently by the Supreme Court of Michigan. Quaere: Assuming an employer furnishes water from a source of infection to which the public in general is exposed, what would be the employer's liability? Interesting is also the New York case of *Scheerens v. E. W. Edwards & Son*,⁴⁷ in which it was held that the employee's complaint in a common law action was sufficient against defendant's motion on the pleadings upon the ground that plaintiff's only remedy was under the Workmen's Compensation Law, where the complaint alleged that the employee contracted typhoid fever from water furnished by defendant employer and had become contaminated through his negligence, and that the employee drank such water during the months of September, October, and November of a specified year. The court based its decision upon the ground that it could be determined only from expert testimony as to whether the disease was contracted from a single drink or from drinking the contaminated water for a longer period of time.

Another standard of causal connection between employment and invasion of germs is that of special exposure. Where the employee had not been exposed by reason of his employment to a special risk of contracting the contagious disease, there is no showing of any causal connection. This rule is

⁴⁵"Manual of Bacteriology", Robert Muir & James Ritchie, 6th ed., p. 408, MacMillan Company, New York.

⁴⁶226 Mich. 83, 197 N. W. 499 (1924).

⁴⁷133 Misc. Rep. 616, 232 N. Y. S. 557 (1929).

most frequently invoked where, by reason of his employment, the servant has been sent to a place where an epidemic is raging. In *Fidelity & Casualty Co. of New York v. Industrial Accident Commission et al.*⁴⁸ petitioner's husband had been sent to a foreign country, where—the employer having knowledge thereof—a typhoid epidemic was raging. It was, however, shown that the natives of that country were less affected by the disease than recently arrived foreigners, that in other words their power of resistance was greater than that of newly arrived people. Compensation was awarded upon the ground of special exposure. And this case is the foundation for an attack upon the *Pattiani* case with which we started. The majority of the justices in the *Pattiani* case do not seem to have grasped the full import of the facts alleged by the petitioner in this case. The dissenting opinion in the case is very much more clear. It would seem that the eating of oysters was only a circumstance of minor importance. The main thing was the exposure to the epidemic. Furthermore, as Justice Finch in his dissenting opinion points out: "It is axiomatic that to go from a place of safety into a place of danger is to incur a special risk, and if one's employment requires him to incur such risk, any injury resulting therefrom certainly arises out of the employment." There is a further reason why the *Pattiani* case should have been decided the other way, and this reason becomes particularly strong because the foundation thereof is furnished by the very same courts. It is a well known fact that a change in climate, of place of residence such as from the East Coast to the West Coast, the traveling, the change of diet, of air, and so on, may, for instance, cause in a woman the lapsing of her menstrual period. "Another common cause of functional amenorrhea is change of climate. This fact has been known for a long time, but even now comparatively little of a definite nature can be stated as to the exact reason for this phenomenon. I have had an opportunity of observing it in many immigrants from Europe and can testify to its great frequency".⁴⁹ This is a process and stage of transition and adjustment of the human body to new surroundings and new living conditions. Why not apply the underlying principle to the male in a corresponding manner? If this be so, the New Yorker would have the advantage of stabilized acclimatization over the newly arrived San Franciscan, and vice versa. Going one step further, one might come to the conclusions arrived at by the Appellate and Supreme Courts of California in the *Fidelity and Guaranty* case that the process of adjustment leaves the system of a visitor less protected against infection than that of a native, and that this constitutes a special exposure to the visitor to New York from San Francisco.

Where there is an exceptional exposure the causal connection between

⁴⁸84 Cal. App. 506, 258 Pac. 698 (1927), hearing denied by Supreme Court.

⁴⁹"Menstruation and Its Disorders", Novak, Gynecological and Obstetrical Monographs, p. 171, 1926, D. Appleton and Company, New York and London.

employment and invasion of germs is reasonably definitely established. In *San Francisco v. Industrial Accident Commission*,⁵⁰ the employee, a nurse, at the time he contracted his disease had handled at least twelve cases of developed influenza while in the course of his employment. There was medical testimony that he contracted it as a result of his work. Compensation was awarded. Where a refrigeration mechanic of defendant company, while working on the refrigerator of a hospital, harboring patients with small-pox, contracted this disease from which he died, it was held that his death was compensable, as it was shown that deceased could have come in contact with refuse from those patients, even though he had been in a village where two families had been quarantined because of small-pox just four days prior to his work at the hospital.⁵¹

THE CAUSAL CONNECTION BETWEEN EMPLOYMENT AND INFECTION AFTER THE INVASION

In the second class of cases the issue is not so much as to whether or not the germs have invaded the body of the workman, but rather whether or not an infection resulted in fact. "When the large area of the body that is subject to traumatic injury and accidental infection is considered, it is remarkable that, considering the enormous number of various bacteria, infection does not occur more frequently".⁵² There are a number of evidentiary facts which help to establish that an infection resulted indeed after germs have entered the body of the patient. As a general rule it may be said that the more virulent the germs, the more likely that they have caused the infection. The virulence may increase or decrease. Abnormal temperatures as to the germs, dryness of media in which they are contained, are apt to decrease virulence or even to kill the germs. On the other hand, passage through organic matter, animals, particularly when of the same species, or through dead animal matter, increases germ infectiousness. The embalmers' cases, those of anthrax, actinomycosis, and so on, as discussed in *Connelly v. Hunt Furniture Co. et al.*; *Blaess v. Dolph et al.*; *McCauley v. Imperial Woolen Co. et al.*; *Hiers v. John A. Hull & Co.*, etc., are good examples.

Lowered vitality, local or general, is another factor which justifies the inference that the invading germs have caused the infection as alleged. Thus, in the *Unkovich* case⁵³ where the employee had bruised his leg, causing a contusion and discoloration with subsequent septicemia, the medical expert testimony established that the injury would furnish an area in which the resist-

⁵⁰183 Cal. 273, 191 Pac. 26 (1920), rehearing denied.

⁵¹*Vilter Mfg. Co. et al. v. Jahncke et al.*, 192 Wis. 362, 212 N. W. 641, (1927).

⁵²"Infection, Immunity and Biologic Therapy", Kolmer, 3rd ed., p. 65, W. B. Saunders Company.

⁵³169 Minn. 491, 211 N. W. 683 (1927), see notes 29 and 34.

ance of the tissues was so considerably lowered, and also their ability to fight against the bacteria and successfully cope with them, that the germs got a chance to grow. The testimony continued: "We know it is perfectly true, if these bacteria get a chance to grow and multiply, and find a ready field, that they gradually increase their virulence, and such area would furnish a site at which this condition would take place, until finally the bacteria were strong enough to attack other healthy tissues; * * * ." It seems, however, that deep-seated infections, without visible external avenue of entrance, do not always point to an infection from the outside, even though there is an external injury. Thus, in *Antonew v. N. W. States Portland Cement Co. et al.*⁵⁴ the doctor testified that the trouble complained of was not caused from the surface, but from the inside, and that the infection in all probability had not been caused by outside germs. Another example of local lowered vitality in the case of *In Re Burns*,⁵⁵ where the employee received an injury to the spine, severing his spinal cord so that loss of sensation below the seat of injury resulted. A bed sore developed which brought about blood poisoning, from which the workman died. Compensation for his death was awarded. In *Armour Fertilizer Works v. Baker et al.*⁵⁶ the employee, suffering from hardening of the arteries, had an injury to his toe. There was a complete rupture of the skin, and the arteriosclerotic condition made him more susceptible to blood poisoning than a normal person. It was held that his death was compensable. But, where the disability was an infection of the kidney, claimed to have been the result of an industrial accident, and where a medical examination about two months thereafter revealed apparently a tipped womb and a dropped kidney, which later showed infection, compensation was denied. There was proof that a pessary had been inserted following the alleged injury so that the womb became infected. "Clearly", said the court, "the alleged infection, introduced two months after the alleged accident by the introduction of a pessary was not such an 'infection as may naturally and unavoidably result' from a fall which merely bruised the person".⁵⁷

Where an employee is suffering from a disease in its incubation period and at the same time is injured by reason of the employment, the vitality is also so low that infectious germs easily overcome the power of resistance, thus causing an infection and even leading to death. In *Banks v. Adams Express Co.*⁵⁸ the employee fell from a wagon on which he was working and sustained a fracture of the skull which aggravated his typhoid fever in the incubation stage so that he died. Compensation was awarded.

Finally, there is a class of cases of lowered vitality, where recovery has

⁵⁴204 Iowa 1001, 216 N. W. 695 (1927), see note 33.

⁵⁵218 Mass. 8, 105 N. E. 601 (1914).

⁵⁶153 Md. 631, 139 Atl. 356 (1927).

⁵⁷*Kade v. Greenhut Co., Inc., et al.*, 193 App. Div. 862, 185 N. Y. S. 9 (1920).

⁵⁸221 N. Y. 606, 117 N. E. 1060 (1917).

been permitted for disability or death, "due to diseases apparently disassociated with the accident", the theory being "as supported by medical experts that the trauma weakens the resistance of an individual so as to permit of a successful attack by the bacilli ever present in the human system. The body, we are told, is the unconscious, unwilling, and yet constant host of many destructive organisms which find entrance through its orifices and otherwise. The human throat and respiratory tract for example harbors the virulent pneumococcus germ, which is ever on the alert awaiting a favorable opportunity to attack and overcome the normal defenses with which nature has endowed us. When, as the result of exposure, chill or trauma, our vitality is lowered, a breach is made in our defensive wall, and we surrender to the enemy, suffering pneumonia, and perhaps death. The same situation obtains with respect to the tubercular bacilli and to other infectious diseases characterized by a prolonged incubation. This theory now universally accepted reveals the human body as a perpetual battle ground, the theater of a dramatic conflict between the defensive forces of the body and the invading hosts of disease. The tide of battle ebbs and flows, the contending forces in a perpetual conflict for possession of our bodies. The bacterial legions, as if inspired by the thought of man's mortality, after each repulse, rush eagerly to the fray until at last, when vigilance and valor will no longer serve to check or repulse the hosts of evil bacilli, when the last rampart has been carried, the black banner of disease, disaster, and death is planted in the very citadel of our being. Whether the typhoid bacillus may be classed with the pneumococcus germ and other bacterial parasites, in the respect that they are said to lie dormant in the human body until some favorable opportunity arises due to lowered vitality caused by trauma, for example, before attacking, is a question which from the record before us, and the authorities presented by both sides involves much doubt. * * * * Since it is our opinion that the decision of this case must largely depend upon whether typhoid may be classed with pneumonia, syphilis, and other diseases of protracted incubation and latent virulence, in order that it may be shown to be within or without the authority of the jurisprudence referred to, and since it is a compensation case, we have concluded, in the interest of justice, to remand the case to the district court in order that medical testimony be admitted for the purpose of further informing us concerning the characteristic of the typhoid bacilli". This passage from *Sutton v. New Orleans Public Service*⁵⁹ is so lucid that the writer is not inclined to add to it more than a few decisions of other jurisdictions. In *Rist v. Larkin & Sangster et al.*⁶⁰ the Supreme Court of New York held that where a crane operator jumped into the river when one of the timbers of the crane broke, to save himself from being struck, contracting a cold

⁵⁹14 La. App. 684, 130 So. 859 (1930).

⁶⁰171 App. Div. 71, 156 N. Y. S. 875 (1916).

from the wetting, which resulted in pleurisy and pulmonary tuberculosis, he was entitled to compensation, as his position had been the same as if by accident he had been thrown into the water. In *McCoy v. Jones & Laughlin Steel Co.*⁶¹ the evidence showed that the employee, deceased, fell from the roof of one of defendant company's buildings to the ground resulting in fractures of vertebrae accompanied by partial paralysis of one side of the body, some internal injuries and a condition of shock. On the tenth day after hospitalization he developed what, according to the autopsy seems to have been diphtheria. The commission found that the injured workman's vital resistance had been so lowered by the injuries received that he succumbed to his diphtheria infection. The medical expert testimony was contradictory. The physicians and surgeons who attended the patient were of the opinion that death was caused by diphtheria, while those of defendant negated any causal connection between the injuries and infection. The Supreme Court of Pennsylvania held that the evidence was insufficient to establish that the original, compensable injury caused the diphtheria and ensuing death therefrom. The case is indeed a close one. Four possibilities offer themselves for consideration. The patient :

- (a) contracted diphtheria after hospitalization and while in the hospital;
- (b) was in the stage of incubation of diphtheria at the time of the injury;
- (c) was a "carrier", but had had diphtheria prior to his injury;
- (d) was a "carrier", but had had no diphtheria prior to his injury.

It is quite possible that the workman contracted diphtheria while in the hospital from some one who was suffering from this disease or from a "carrier". If so, the employer would not be liable because of the intervention of an independent agency interrupting the chain of proximate causation. On the other hand, could not the employee have been in the stage of incubation at the time he was injured? If so, certainly liability of the employer would attach. However, the time which elapsed since the workman became hospitalized speaks against such inference because the patient's diphtheria became observable at or after the tenth day after his admission, while the disease breaks out in from two to five days after inoculation. The patient may have been a "carrier" himself. Then the question arises whether or not he had suffered from diphtheria prior to his injury. If so, the odds are against reinfection by reason of lowered vitality, although "one attack of diphtheria does not always confer a lasting immunity; second and third attacks are not uncommon".⁶² If the patient had had no natural diphtheria immunization by reason of having suffered from the disease prior to his injury, the situation is

⁶¹275 Pa. 422, 119 Atl. 484 (1923).

⁶²"Infection, Immunity and Biologic Therapy", Kolmer, p. 860, see note 52.

different. It is possible that the lowered vitality could have ushered in an active diphtheritic process. It seems that this problem has not received as yet that attention of medical men which it deserves. So far it must be said that diphtheria has not been held to be a compensable injury in Pennsylvania judging from the decision of the *McCoy v. Jones etc.* case, and also not compensable in New York as evidenced by the decision of *Bixby v. Cotswold Comfortable Co.*⁶³

⁶³195 App. Div. 659, 186 N. Y. S. 762 (1921).