

mucous tissues, and the second should be passed through the serous and muscular walls, and this row should extend a little beyond the extremities of the wound. The surface should now be finally cleansed, then dusted with iodoform, and the ends of the silk retractor cut off.

In some cases a soft self-retaining catheter can be introduced to secure complete rest of the organ. Other patients I have found prefer the introduction of an instrument every two or three hours to any other method of keeping the bladder empty. In extensive injuries the organ can be very efficiently drained by making a temporary vesico-vaginal fistula, and uniting the mucous membrane of the bladder to the mucous membrane of the vagina. As soon as the injured part has healed the mucous surfaces are separated, and the opening closes without any surgical interference.

Dr. Frederick Holmè Wiggin of New York City\* mentions the case of a woman who underwent hysterectomy for a large myoma. The bladder was injured at the fundus during the separation of some extensive anterior adhesions. The wound was closed at once by suture. For ten days the progress was very satisfactory, but then tumefaction took place at the lower angle of the abdominal wound and this was soon followed by a free escape of urine. A vesico-vaginal fistula was made to ensure complete drainage of the bladder. The abdominal sinus was deodorised and curetted, and then closed by suture. The patient rapidly recovered, and the fistula healed without any surgical treatment.

It is sometimes an important question to decide whether the abdomen can be safely closed without any provision for drainage. This must be determined by the severity of the injury, the state of the urine, and the condition of the peritoneal cavity. Surely, if other organs can be injured and the abdominal wound closed, there can be no reason why bladder injuries should not admit of the same treatment. In my case, however, it appears highly probable that the introduction of a glass drainage tube was a fortunate precaution, and materially aided in saving the life of the patient by establishing a channel for the direct escape of the urine. On the other hand, if the abdomen had been completely closed at the time of the operation, the rupture would have been followed by the accumulation of septic fluid within the pelvis, which would have very probably terminated in fatal septicæmia.

## REFERENCES.

\* *Centralbl. f. Gynäk.*, No. 11, 1899; EPITOME OF THE BRITISH MEDICAL JOURNAL, May 6th, 1899, p. 331. <sup>2</sup> *Journal of the American Medical Association*, September, 1899.

## ABSTRACT OF THE REPORT OF A COMMITTEE ON THE MEDICO-LEGAL RELATIONS OF THE X RAYS,

Made to the American Surgical Association at its Meeting in  
Washington, May 1st, 1900.

By J. WILLIAM WHITE (CHAIRMAN),  
Professor of Clinical Surgery, University of Pennsylvania.

THE report begins by stating that at the meeting in 1897, in a paper on the Roentgen Rays in Surgery, the Chairman of the Committee made the following remarks:

Before leaving the subject of fractures it may be well to present for discussion a few questions having a medico-legal bearing, even although it may not be possible at present to answer them finally.

We begin by asking whether skiagraphy has as yet given us a better understanding of fractures in general or has been the means of suggesting more efficient treatment. It is difficult, in reply, to point to any one definite addition to our knowledge of these injuries, and so far as I know no material modification of the general rules governing the treatment either of fractures generally, or of any specific fracture, has as yet resulted; but in individual cases, such as have been described above, it has certainly been of great utility, and is likely to become more valuable as technique improves and experience increases.

The question whether or not the patient has the right to demand as ordinary care that the medical attendant should have a skiagraph of the fracture taken, I would at this time unhesitatingly answer in the negative. Until a much larger number of cases have been observed and the pictures and the clinical results have been compared the routine use of skiagraphy might be more harmful than useful.

There can be no doubt, however, that skiagraphs will figure largely in suits for damages after accidents and in cases of alleged malpractice. They have already been admitted as evidence in such cases, and it is probable that juries will with increasing frequency have to decide whether to place greater weight on deformity as shown by skiagraphs or

on expert evidence as to the absence of genuine disability. It seems obvious that each case must be studied by itself, but that it would be injudicious, if not altogether unwarranted, for us to assume at present that clinical experience and the judgment based upon it should be subordinated to the pictorial testimony of the skiagraph.

It is not, however, too soon to advise that in all obscure, complicated, and unusually difficult cases the help afforded by the Roentgen rays shall be secured by the surgeon, even if it is done chiefly with a view to his own protection.

As time goes on it is probable that we shall be better able to estimate accurately the precise clinical value of minor deformities. In the meantime it seems to me we should be careful to avoid the setting up of an impossible ideal as a standard in fracture cases.

After discussion it was on motion resolved that a committee be appointed "to formulate an opinion as to the reliability of skiagraphs," and the result was the formation of this Committee on the Medico-legal Relations of the X-rays.

In 1898 material was collected from current literature and from the personal experiences of the Committee. In February, 1899, a circular letter was sent to every member of the Association asking for an answer to the following questions:

## QUESTIONS.

1. Have you found skiagraphy reliable in the diagnosis of (a) fractures attended with so much swelling of surrounding tissues that satisfactory palpation of the fragments is impossible? (b) fractures about joints? (c) epiphyseal separations? (d) fracture of the neck of the femur? (e) ununited fractures?

2. Have you any reliable cases of recognition of (a) fracture of the base of the skull? (b) fracture or dislocation of the vertebræ? (c) fracture of the sternum, scapula, clavicle, or pelvis?

3. Do you know of any cases in which the testimony of the skiagraph in cases of supposed foreign bodies in tissues, or of tumours, gall stones, or kidney stones, has led to ineffective or mistaken operations?

## ANSWERS.

The replies to question No. 1 were uniformly in the affirmative, except as to item (d), which refers to the neck of the femur. As to that, with but one exception, the replies were negative.

As to question No. 2, they are almost as uniformly in the negative.

Question No. 3 was answered negatively by twelve and affirmatively by six.

In other words, the large majority of the surgeons who replied to the communication had found the skiagraph satisfactory in fractures with great swelling, fractures about joints, epiphyseal separation, and ununited fractures, but not in fractures of the femoral neck. The same number had not had reliable pictures of fractures of the base of the skull, of the spine, of the pelvis, sternum, or scapula. A few had used it in cases of fracture of the clavicle, but there it is obviously rarely necessary.

The answers to the third question vary, as during the time of the correspondence rapid improvement was made in the technique, and renal calculus became fairly easily recognisable. Of course, it was not likely that many cases of mistakes as to supposed foreign bodies in the tissue would occur, but the cases recorded serve as a warning as to the possibility of such mistakes.

At the meeting in 1899 the Committee reported progress, and asked to be continued, feeling that the position taken finally on this question should rest upon the broadest possible foundation, and thinking the evidence then available insufficient for the purpose of drawing general conclusions which might serve as a safe guide to both the medical and legal professions in appropriate cases.

In presenting the final report this year the Chairman of the Committee said that in fairness to skiagraphy itself as a surgical aid, it should be stated in advance that many of the errors of which examples are cited in the report are avoidable; that the habit of taking more than one plate and of comparing with plates from the normal region corresponding will lessen them when it is systematically adopted; and that there is no disposition on the part of the Committee to deny or disparage the great usefulness of skiagraphs in surgery. The report proceeds:

"But usefulness and infallibility are not identical. In a thing which purports to be a representation analogous to a photograph, showing only what exists and nothing else, the claim of infallibility, of exact accuracy, is sure to be made by some lawyers, and listened to approvingly by some judges and juries. Your Committee believes that the time for such an attitude has not arrived, and that the facts now before the profession, some of which are herewith presented, justify this conclusion.

"In trying to systematise the material bearing on this subject it has seemed well to classify the evidence, which goes to show:

"1. That there have already been cases of improper use of the skiagraph in court.

"2. That there is real danger for the future from the teachings of some of the profession who have not preserved a judicial mental attitude, but have been led by the many and undoubted advantages of skiagraphy to exalt it beyond its present merits.

"3. That important mistakes have been made in reference to (a) fractures, (b) foreign bodies, (c) renal calculi.

"4. That suits for damages on account of *x*-ray burns and their consequences are now occurring, and that surgeons may suffer thereby, even if not the actual skiagraphers.

"5. That to counterbalance the extremists, many of the profession have called attention to the fallacies of skiagraphs, and to the danger of their use as medico-legal evidence."

Following this classification abundant testimony is cited and many illustrative cases are given. The report finally presented for discussion the following summary of the conclusions thought to be justified by the facts collected under the above headings:

"1. The routine employment of the *x* ray in cases of fracture is not at present of sufficient definite advantage to justify the teaching that it should be used in every case. If the surgeon is in doubt as to his diagnosis, he should make use of this as of every other available means to add to his knowledge of the case, but even then he should not forget the grave possibilities of misinterpretation. There is evidence that in competent hands plates may be made that will fail to reveal the presence of existing fracture, or will appear to show a fracture that does not exist.

"2. In the regions of the base of the skull, the spine, the pelvis, and the hips, the *x*-ray results have not as yet been thoroughly satisfactory, although good skiagraphs have been made of lesions in the last three localities. On account of the rarity of such skiagraphs of these parts special caution should be observed, when they are affected, in basing upon *x*-ray testimony any important diagnosis or line of treatment.

"3. As to questions of deformity, skiagraphs alone, without expert surgical interpretation, are generally useless and frequently misleading. The appearance of deformity may be produced in any normal bone, and existing deformity may be grossly exaggerated.

"4. It is not possible to distinguish after recent fractures between cases in which perfectly satisfactory callus has formed and cases which will go on to non-union. Neither can fibrous union be distinguished from union by callus in which lime salts have not yet been deposited. There is abundant evidence to show that the use of the *x* ray in these cases should be regarded as merely the adjunct to other surgical methods, and that its testimony is especially fallible.

"5. The evidence as to *x*-ray burns seems to show that in the majority of cases they are easily and certainly preventable. The essential cause is still a matter of dispute. It seems not unlikely, when the strange susceptibilities due to idiosyncrasy are remembered, that in a small number of cases it may make a given individual specially liable to this form of injury.

"6. In the recognition of foreign bodies the skiagraph is of the very greatest value; in their localisation it has occasionally failed. The mistakes recorded in the former case should easily have been avoided; in the latter they are becoming less and less frequent, and by the employment of accurate mathematical methods can probably in time be eliminated. In the meanwhile, however, the surgeon who bases an important operation on the localisation of a foreign body buried in the tissues should remember the possibility of error that still exists.

"7. It has not seemed worth while to attempt a review of the situation from the strictly legal standpoint. It would vary in different States and with different judges to interpret the law. The evidence shows, however, that in many places and under many different circumstances the skiagraph will undoubtedly be a factor in medico-legal cases.

"8. The technicalities of its production, the manipulation of the apparatus, etc., are already in the hands of specialists, and with that subject, also, it has not seemed worth while to deal. But it is earnestly recommended that the

surgeon should so familiarise himself with the appearance of skiagraphs, with their distortion, with the relative values of their shadows and outlines, as to be himself the judge of their teachings, and not dependent upon the interpretation of others who may lack the wide experience with surgical injury and disease necessary for the correct reading of these pictures."

[These conclusions were unanimously adopted as expressing the views of the American Surgical Association.]

## REMARKS

ON

## PLAGUE IN THE LOWER ANIMALS.

By FRANK G. CLEMON, M.D., D.P.H.

(Concluded from page 1116.)

### CARNIVORA.

Dogs, cats, and jackals have at some time been believed to become the subjects of plague.

#### *Plague in Dogs.*

*a. Under Natural Conditions.*—Although the few experiments which have been made to test the susceptibility of dogs to plague have given almost negative results, there is some evidence—though far from conclusive in character—that these animals may occasionally suffer from the disease. Even so far back as the Black Death in the fourteenth century dogs were believed in Italy to have contracted plague.<sup>60</sup> In London in 1543, 1563,<sup>61</sup> and 1665,<sup>62</sup> and in Leeds in 1645,<sup>63</sup> dogs were regarded as probable carriers of infection, and were consequently slaughtered in immense numbers. This was also the case in the Great Plague of Moscow in 1770-72. In modern times dogs have been said to suffer from the plague in China.

It will be convenient to refer here to an oft-quoted statement to the effect that, in the endemic centres of plague in China, the rats are attacked first, and then the larger animals, successively, in order of increasing size. This opinion was first enunciated over twenty years ago by Pere Fénouil, the French missionary in Yunnan.<sup>64</sup> More recently the same observer, now Mgr. Fénouil, Bishop of Yunnan, has expressed this view as follows:

In the plains visited by Yang-tzu-ping [or the plague] the first victim is invariably the rat, whose snout is always close to the earth; in succession and regular order the pig, cat, dog, and ox, and finally man, whose mouth is most distant from the soil, are afterwards attacked.<sup>64</sup>

An observation of this kind, could it be confirmed, would be of great interest as indicating to some extent (though not without some obvious fallacies in the mode of reasoning) that the plague virus was a miasma rising from the ground, and decreasing in virulence as the distance from the ground increased. No observation, however, of a similar character has, I believe, been made elsewhere. It is, indeed, for the present, uncertain whether some of the animals named ever contract plague under any circumstances, and it is impossible, therefore, to accept unreservedly the view here stated.

In Mengtze dogs were believed to have become infected by eating the flesh of human plague corpses, but in Hong Kong, Canton, and Macao no incident of the kind was observed.<sup>65</sup> I have elsewhere recorded a doubtful instance of plague in a dog.<sup>66</sup> In Poona on two occasions, in the lines of the 2nd Bombay Lancers and of the 29th Bombay Infantry respectively, dogs were believed to have contracted plague, but final proof of the nature of the disease in them is not adduced.<sup>67</sup> In Jeddah, both in 1897 and 1898, there is said to have been a great mortality among dogs about the time of the appearance of plague there in man.<sup>68</sup> In Bombay, in the months preceding the recognition of plague there in the autumn of 1896, the number of deaths in dogs was, on the other hand, rather below than above the average.<sup>69</sup>

*b. Under Artificial Conditions.*—The German Plague Commission found that dogs inoculated with virulent concentrated suspensions of plague bacilli gave hardly any reaction. Of two dogs fed with pure cultivations one remained well, the other became slightly ill; but no plague bacilli were found in the swollen glands.<sup>70</sup> Ogata, experimenting in Formosa on behalf of the Japanese Government, found dogs quite refractory to artificial infection with plague.<sup>71</sup>