

bon bisulphide; the other, a solution of celluloid in acetone. The latter is preferable.

The brace portion of the jacket having been finished, the front portion should be moulded upon the cast, so as to overlap the sides about an inch. The front piece is moulded over the cast, after incising the upper half of it in the median line; this permits an overlapping of the upper portion, and causes the upper part to press on the upper chest with any chosen degree of pressure. This pressure appears to the writer to be an important advantage in maintaining a correct position of the spine. The front piece should then be treated in a similar manner to the brace portion, to provide for its ventilation and protection from moisture. It should then be attached by a leather hinge to one side of the brace; strips of leather with eyelets for lacings should be attached to the other side of the front piece and of the brace portion, thus completing the spinal jacket.

SOME OBSERVATIONS ON RENAL CASTS.

BY WALTER E. TOBIE, M.D., PORTLAND, ME.

IN making a systematic microscopic examination of urine, one cannot fail to be impressed with the frequent existence of casts, and that, too, in many instances, without a co-existing albuminuria. So closely has the presence of casts become associated with albuminuria that it is far from the universal practice to submit the urine to a microscopic examination unless albumin has been found; and it is only since the centrifuge has come into more general use that the significance of each has begun to be better understood. The advantage of securing the sediment from a freshly voided urine unaffected by fermentative changes is too apparent to require defence. It is noticeable that by so doing hyaline casts are found in many instances where neither clinical history nor chemical examination would seem to point to their presence. The custom of obtaining urinary sediments by allowing the urine to stand for twelve to twenty-four hours in a conical glass has given fair results; but the urine necessarily undergoes bacterial and chemical changes, and it seems not unreasonable to believe that structures so delicate as hyaline casts may by these changes become disintegrated or so altered as to be difficult or impossible of detection. Certainly there is no good reason for believing kidney disease to be increasing to the alarming extent that microscopic examination of urine might imply. The increase is apparent and depends upon better and more systematic urinary examination.

The three theories of cast formation are that they result from the disintegration of renal cells, from a morbid secretion of these cells, or from a leakage of serum albumin into the tubules. All of these theories imply some structural kidney change, temporary or permanent, and we might then expect to find with casts always a greater or less amount of albumin. This, I am convinced, is not the case, notwithstanding the view of many, who contend that casts are never found in urine unless it contains albumin or has recently contained it. Testing for minute traces of albumin is difficult, uncertain and unsatisfactory, as is evidenced by the great number of test solutions and methods of testing, and the opinion is quite general

that an amount of albumin too small to be detected by the boiling or nitric acid contact test is too small to have any clinical importance. Tannet's potassiomercuric iodide test is capable of detecting the most minute trace of albumin. It is oversensitive and valuable, therefore, as a negative test to prove not the presence of albumin, but its absence. Such a non-albuminous urine may contain casts, and, I believe, this condition is much more common than it is possible to ascertain, because urinary examinations are made, as a rule, in general practice only when there are indications pointing to disease of the urinary organs or passages.

From the analysis that I have made in the laboratory of Dr. Alfred King, I have taken two hundred in regular order, without any attempt at selection as regards season of the year, age of the patients, or their diseases. The results as regards albumin and casts are as follows:

Urine containing neither albumin nor casts	109
" " albumin without casts	29
" " " with casts	35
" " casts without albumin	27
	200

It will be seen that the cases of albumin with casts were rather more frequent than either alone. In making these tests, every effort was made to detect minute traces of albumin. Had this not been done, the proportion of cases where casts occurred without albumin would have been very materially increased. The cases of albumin without casts were almost invariably due to blood or pus from the genito-urinary passages.

I have mentioned three influences which might affect a series of urinary examinations as regards casts, the first being the season. This has a bearing only to the extent that diseases affecting the kidneys are more common at certain seasons, notably, the winter and early spring. Age is a decidedly important factor. Although it has long been taught that the kidneys in old age undergo a change comparable to that of cirrhotic kidney, it is not generally appreciated how common this condition is, nor how early in life the change may begin. Repeated examinations of urine from patients between fifty and sixty, certainly far from senile, show the presence of hyaline casts in many instances. Inasmuch as they may be present for many years without symptoms pointing to their existence, these questions naturally suggest themselves. Is the mere presence of hyaline casts necessarily a grave omen? May not the disease be checked or even of itself cease to advance? May they not be present in urine from kidneys whose excreting functions are practically normal?

The occurrence of casts with chronic constitutional diseases is extremely common, but the influences determining their formation are not altogether apparent. Thus in the constitutional disturbance accompanying carcinoma I found, while a house doctor at the Maine General Hospital, that hyaline casts were very common and that the urine was almost invariably free from albumin. This observation became so strikingly frequent that I was led to believe that some relation existed between the carcinoma and the production of casts, and that it resulted from some impairment of nutrition or from poisonous products occurring in the cancer formation. It was noticed, also, that in many of these cases the administration of ether caused no noticeable disturbance of the kidney functions.

Considering the importance attached to kidney disease by life insurance companies, the means employed by their examiners for detecting the same are surprisingly lax, since a microscopic examination is not part of the routine. While I should question very much the advisability of making the presence of casts a standard for refusal, it certainly should constitute a reason for a more searching examination regarding the eliminating functions of the kidneys. I believe that insurance companies will yet issue endowment policies knowingly to applicants whose urine contains casts, even as they have done so for many years unknowingly.

Medical Progress.

PROGRESS IN PATHOLOGY.

BY JAMES H. WRIGHT, M.D., BOSTON,
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GUNSHOT WOUNDS AND TETANUS.

THE great frequency of tetanus, following wounds from blank cartridges, is well known. H. Gideon Wells¹ has made a study of the blank cartridges on the market with the object of determining whether tetanus spores were present in them or not. Upon inquiry he found that the blank cartridges on the market were manufactured by five different firms in this country and in Canada, and samples of each of these were obtained for examination. In all about 200 cartridges were examined, but in none of them were tetanus bacilli found.

The method of examination was as follows: (1) The wads, powder and shells were first heated to 85° C. for forty-five minutes and then cultures on glucose agar and other media were made. Cultures were also made without the preliminary heating. (2) A series of animal inoculations of guinea pigs and mice were made, in various series, with wads and powder and with agar and bouillon cultures, both with and without heating. Ultimately for the examination of a large number of cartridges the following plan was adopted. Wads from ten cartridges were broken up into fine pieces and placed in bouillon sufficient to cover them; the fluid was then heated to from 80° to 85° C. for forty-five minutes and grown for one week under anaërobic conditions. The cultures were then inoculated into mice and guinea pigs, and also examined microscopically. Agar cultures were made in deep stab. The bouillon cultures were covered with paraffine, after a previous boiling. The tissues were then placed in sealed jars with pyrogallic acid.

Cartridge wads were also inserted in the muscular tissue of animals and allowed to remain there for three days to two weeks. They were then removed, or inoculated into other animals, or cultivated anaërobically. These experiments all gave negative results. Microscopical examination of the cartridge wads showed them to be made of wood pulp.

THE NEW FORMATION OF ELASTIC FIBRES IN THE STROMA OF MALIGNANT TUMORS.

The invention of a selective stain for elastic fibres by Weigert has enabled histologists to recognize elas-

tic tissue with a facility which was not possible a few years ago.

It is of considerable histological interest to know whether, in the newly-formed tissue of malignant tumors, elastic fibres are produced as well as white fibrous tissue. The following workers have investigated this question with the aid of Weigert's staining method, with the following results:

H. U. Williams² finds, (1) when the stroma of carcinoma is itself of new formation it is usually free from elastic fibres; (2) newly-formed elastic fibres may occur in the stroma, though rarely, and they are likely to be fine in quality and small in number; (3) the tumors in which newly-formed elastic fibres occurred either contained a large amount of connective-tissue stroma, or the newly-formed fibres were in connection with pre-existing elastic elements of the original parts.

W. C. White³ comes to practically the same conclusions from his study of the subject.

Alice Hamilton,⁴ on the other hand, finds in certain soft epithelial tumors, with relatively small amount of stroma, a rich growth of elastic fibres. Thus, in adenocarcinoma of the uterus, stomach and mammary gland the stroma in many instances consisted largely of such fibres and very seldom were they altogether wanting. In fibrosarcoma, and alveolar sarcoma also, good evidence was obtained of a new formation of elastic fibres, but in subcutaneous fibromata and in a myofibroma of the uterus new-formed elastic fibres were much less numerous than might be expected. In scirrhus carcinomata of the pancreas, mammary gland and liver undoubted evidence of new formation of elastic fibres was obtained.

THE ORIGIN OF SIMPLE CYSTS OF THE OVARY.

At the present time the generally accepted view as to the origin of these cysts is that they are of the nature of retention cysts of the Graafian follicles. This view, probably, is due to the observations of Rokitansky, who claimed to have found ova in some of these cysts. Other observers, however, think that some of them, at least, are new growths. Von Kahliden,⁵ in a needlessly long and verbose paper without a summary, has submitted the question of the origin of these cysts to a careful examination. He studied cystic ovaries from 19 cases in adult women of varying ages. His conclusions are that these cysts are not derived from Graafian follicles, but arise from solid or tubular ingrowths of the germinal epithelium. His conclusions are based upon (1) the observations of these ingrowths of epithelium; (2) the absence of ova in the smallest of the cysts; (3) the occurrence of cysts in ovaries long after the formation of ova has ceased; (4) the absence of any tendency to form ova, except in 1 case. In this case, however, many ova-like bodies were formed, but never reaching the normal size; (5) the difficulty of explaining these cysts as retention cysts, in view of the fact that they are always superficial, that they have thin walls and that there is no apparent mechanical reason why, if they are retention cysts of Graafian follicles, they should not rupture as readily as the Graafian follicle itself.

² Contributions to the Science of Medicine, Dedicated by his Pupils to William Henry Welch, upon the Twenty-fifth Anniversary of his Doctorate.

³ Bulletin of the Johns Hopkins Hospital, September, 1900.

⁴ The Journal of Experimental Medicine, vol. v, No. 2, October 25, 1900.

⁵ Ziegler's Beitrage, 1900, xxvii, 1.

¹ Philadelphia Medical Journal, June 16, 1900.