eficial effects are at once manifested by a decreased amount of sugar in the urine and in the amount of urine secreted; it also makes it far less irritating to the duodenum, thereby decreasing the reflex trouble. The salicylate of soda is recommended for the same purpose, but in my hands the results have not been so desirable; the only advantage it could have over potassium bicarbonate would be its slight germicidal properties; but this effect is not needed, for the reason that I am giving better germicides.

Another combination of remedies which I have recently used with apparent benefit is as follows:

- R. Creosotegtts. 1/3
Tinct. nucis vomicæ.....gtts. x
Saw palmetto.....3i
- M.

In the saw palmetto we have something of a tonic as well as a stimulant to the mucous membrane, thereby lessening retrograde metamorphosis of this tissue.

As a matter of course the environments of the patient should be hygienic, with plenty of fresh air, also baths and massage of the skin every other day, and no mental nor physical work.

A large majority of the cases of diabetes which I have treated have been in my clinic of the University Medical College, Kansas City, Mo. Only three of these remained with me ten or twelve months, when they were discharged cured. Two cases recovered in my private practice. The remaining number I was unable to follow, so I can not give results. I think I do not say too much when I say all of them were benefited, as indicated by a decrease in the amount of secretion of urine and the amount of sugar present.

Excluding heredity as a factor, and beginning early before pathologic changes have occurred, I should feel hopeful of favorable results.

CLINICAL NOTES ON DIGITOXIN.*

BY JOHN P. SAWYER, M.D.

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Among the few really indispensable drugs which we have, digitalis would be placed in the very front rank by most medical men, and this is true in spite of the fact that its use is attended by certain disadvantages, and that these disadvantages are not regularly to be estimated, owing to the complex nature of the constituents of the drug, and the varying proportions in which these are present in the crude leaves. The various alkaloids and glucosids, obtained from the crude drug, have not been widely known because of technical difficulties in preparation, and have not made their way into general favor. Moreover, the exceeding smallness of the dose, and the considerable risk of cumulative effect have added to the distrust with which most practitioners have looked on these drugs. But the evident gain from the use of a definite active principle is so great that determined efforts have been continued through years, and there is now a considerable mass of cumulative evidence very favorable to the use notably of digitoxin. And I bring it to your notice here because I have found in an increasingly free use of the drug that it is more speedy, more certain than digitalis; that it is efficient in most cases where digitalis is at all likely to succeed—and this may be well inferred from the fact that digitoxin confers on the leaves a large part of their ordinary effectiveness—and, moreover, in a number of cases I have found

digitoxin efficient to a remarkable degree, when digitalis had failed utterly in an ordinary method of administration, and when also a long list of other allied heart tonics had been employed successfully. In fact, I am now using digitoxin in a majority of cases under my observation which present any indication for the use of digitalis.

I will especially refer to an article by Wenzel¹, in which he reports the use of digitoxin under Unverricht's directions in the Madgeburg hospital. This is the more noticeable as within a few weeks Unverricht has stated that he has in these intervening years made a continually increasing use of digitoxin, until now it has nearly displaced digitalis.

The remedy has been administered in solution with glycerin, alcohol, chloroform diluted in water. It has been made use of hypodermically, and has largely been given per rectum. Many writers refer to its irritating properties on the stomach, but this is true particularly of earlier articles, and as the dose has been diminished, there are apparently fewer reports of unpleasant results on the digestive canal. I have as yet to see in the small dose I employ the first symptom of irritation in the stomach, and I have not found it necessary to resort to any other means of medication than by capsules or tablets given by the mouth.

The desirable effect sought to be gained by the administration of digitalis is an increase of arterial pressure, usually with diminution of pulse-rate; while on the other hand we seek to avoid continuance of high arterial pressure with quickening rate, heightened blood pressure with irregularity, and as the extreme the rapid sinking of blood pressure with sudden cessation of heart action, and death. The great weight of experience is that digitoxin accomplishes this first desirable indication within from twelve to twenty-four hours, and the result once accomplished is maintained for a surprisingly long period of time.

My own observations coincide entirely with these statements, and I have a sphygmogram taken from a case of a woman 30 years of age, with a rapid pulse of low tension, slightly irregular, with heart apex in the mammary line in the fifth interspace, with a systolic murmur heard at the apex and toward the base, with accentuation of the pulmonary second sound, complaining of shortness of breath on slight exertion, complaining of a dry hacking cough after exertion, and particularly annoyed by it on lying down at night—so much so that she was unable to sleep for several hours. She had also noticed a considerable diminution in the amount of urine. I directed one-eighth of a milligram, about 1/500 grain, of digitoxin three times a day until the pulse was less than 80, and directed her to report in forty-eight hours. She took two doses the first day, and had very little cough at night; one dose the following morning, and then finding her pulse less than 80, took no more until I had seen her again. I told her to take one dose each evening and report again in forty-eight hours, when I took a second tracing, which shows a decidedly improved condition of arterial pressure, pulse wave far better sustained, and the rate reduced to normal. The patient took but three or four doses, and has been entirely relieved of the symptoms of insufficiency with which she came, and has noticed a marked increase in the quantity of urine.

This leads me to the statement that I have repeatedly noted the favorable diuretic effect in digitoxin. What I have seen in this one case, I have seen in more than a

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¹ Centralbl. f. Inn. Med., 1885.

score like it. In permanence and pleasantness of effect, I have seen nothing to compare with it, and in these small doses I have seen no irritation of the stomach.

As to its effect in cases where other remedies have failed, I will briefly state the essential points in two cases, each of which I had seen four or five years before, and in which I had made the diagnosis respectively of aortic insufficiency and of mitral insufficiency. A gentleman of large frame, 52 years of age, presented himself for examination, and I found the apex of the heart in the sixth interspace in the mammary line, the apex-beat forcible, heaving, pulse 80, water-hammer pulse, capillary pulse, arteries somewhat thickened. On auscultation a soft murmur practically replaced the second sound at the aortic cartilage and was transmitted distinctly down the sternum, and into the carotids; urine normal. Patient was occasionally under my observation as consultant, and last spring was in an advanced state of cardiac insufficiency with increasing vascular changes and secondary disturbances, with albumin, hyaline and granular casts. The various heart tonics were tried, including digitalis in its preparation of tincture, infusion, extract, dried leaves, convallaria, nitroglycerin, adonis, strychnia, all being used at various times, according to the indications presented by the special condition of the patient. From none of the digitalis group were any results obtained comparable to those gained from the digitoxin, and this in a patient in time of secondary disturbances, quite marked as regards the intestinal canal, and without the frequently mentioned irritating action of digitoxin. And in this case, the favorable effect on the circulation seemed to be very efficient in quieting the stomach. The patient died after the establishment of thrombosis in the popliteal arteries. The post-mortem confirmed the diagnosis of aortic insufficiency.

Another case is that of a young woman, 23 years of age, whom I saw five years ago, and not again as a patient until I was called in consultation, finding her in an extreme cardiac insufficiency, propped up in bed, unable to lie down, with marked edema and ascites, passive congestion of the kidney, and marked secondary disturbance in the intestinal tract, vomiting, flatulence, and diarrhea—all contributing to plague the patient. I found that a number of gentlemen had seen the case in consultation, and I could mention no other cardiac tonic which had not been tried out in competent hands, and the attending physician confessed his want of faith in the trial of digitoxin. But nevertheless the prescription was given, and the effect was astonishingly prompt and helpful. The shortness of breath was quickly relieved, the passive congestion of the kidney improved very markedly, and with the betterment sleep and rest was much improved, and the stomach disturbance considerably lessened. A test of the stomach contents obtained at the next vomiting showed an excessive amount of hydrochloric acid, and the prescription of a simple alkali was attended with extremely helpful results. With the efficiency of the digitoxin, and the relief obtained from the use of the alkali the patient made a recovery from what was truly a desperate condition. To the digitoxin belongs a large part of the credit in this case, and the establishment of compensation was very decidedly helped by the occasional use of a few doses of the drug given in this case, as in the preceding one, in $\frac{1}{4}$ milligram doses.

These cases are those of primary heart lesion. Another extreme case was that of a man 40 years of age, with chronic parenchymatous nephritis, in whom the secondary

cardio-vascular changes became very prominent, the cardiac insufficiency at last so extreme that death seemed immediately impending from that cause. In this case also the usual cardiac tonics failed to check the failure of heart muscle, and the very able attending physician was more prone to discuss the probable post-mortem findings than to consider anything likely to relieve the desperate condition. Digitoxin given in $\frac{1}{4}$ milligram doses three times a day was efficient, and a fairly established compensation was obtained for a time, the patient dying six months afterward from uremia, and not from the cardiac insufficiency.

These cases could be multiplied were it desirable, but I present them to illustrate the observations I have made of digitoxin, leading me to summarize its advantages as prompter than digitalis; in sufficiently small doses no more irritating than digitalis; efficient as a diuretic; and so frequently successful when digitalis and other allied preparations have failed, that it would seem no case should be despaired of until the efficiency of this active principle has been tried, and this promptly efficient action not seen only in a limited class of cases, but throughout nearly the whole range of the indications for digitalis in chronic disease. My experience with its use in acute disease is not sufficient to warrant more than favorable notice, and I have therefore not reported the relatively few instances in which I have used it in this class of cases.

THERAPEUTICS OF PNEUMONIA.*

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In asking your attention to the "Therapeutics of Pneumonia," I am aware that I am traveling over a well-worn way: the mass of literature on the subject is simply appalling. But I have the temerity to ask your attention to the subject again, for I believe that the mortality of the disease is so great under ordinary treatment that the burden is on us continually to review our treatment until the statistics of the disease show some reason for our connection with it. I do not propose to weary you with a discussion of the various pathologic conditions that are somewhat loosely described by the general term pneumonia, but wish to be understood as discussing the acute lobar variety. The etiology of the disease is fairly well established. A pathogenic germ described by Fraenkel is said to be present in over 90 per cent. of all cases, although the same organism has been found in pleuritis, pericarditis and even meningitis, and is present in the nasal and salivary secretions of healthy people. The pneumococcus of Friedlander and the streptococci of suppuration are not infrequently found. We are, then, justified in classing pneumonia as an infectious inflammation, the infection being quite often of a mixed type. As a predisposing cause, exposure to cold is usually considered the most important, but I am inclined to think a lowering of normal resisting power, whether from exposure to cold, overexertion or other cause, a fairer statement. It is quite commonly considered a disease of the winter months, but I think this no more true of pneumonia than of other infectious diseases. The eighth and ninth U. S. census reports show the disease to be more prevalent below than above the thirty-ninth

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