transformation introduced arsenic into the product from which it was conveyed to the fermented beverages in which those products were used. Many cases of chronic arsenical poisoning were thus developed. It is not at all unlikely that many similar cases there and elsewhere escaped observation or diagnosis, and that lead poisoning has in the same way been caused and overlooked.

The pertinency of this criticism has been well shown in the revelations brought about by the prosecutions recently undertaken by Dr. Warren, Dairy and Food Commissioner of Pennsylvania. Information coming to him that glucose furnished by the American trust, which now practically dominates the American market for starch sugar, was contaminated in many cases with appreciable amounts of sulphuric acid, he caused an investigation to be made, especially by two chemists of the department, C. B. Cochran of Westchester and C. H. LaWall of Philadelphia. Many samples of the candies and of commercial starch sugar were tested, and the objectionable impurity was found in a large proportion. It was found in the lighter colored samples of glucose and grape sugar, and it is not doubted that it is introduced by and through a bleaching process, for darker products, free from the acid, are easily obtainable. In a circular recently issued by the trust, the presence of this acid and its introduction as a part of the regular operation is frankly admitted, but the language suggests to an uninformed person that its introduction was in the regular manufacture, whereas it is a subsequent treatment to improve the appearance of the product.

The objectionable character of the sulphurous acid or its salts as ingredients of food is now established. Several experimenters have pointed out their poisonous nature. The experiments of Harrington are among the more recent and leave no doubt as to the importance of prohibiting absolutely the sale of foods or beverages containing more than very small amounts of such substances. From a theoretical point of view one would expect such unfavorable results, for the sulphites are well known as protoplasmic poisons of high activity.

The fact that the trust has consented to pay all the numerous fines in Pennsylvania, to withdraw the offending product and to market no more of it does not, in my opinion, justify the closing of the general issue. The abandonment of the recently instituted proceedings is, of course, merely a legal question, but I refer to the inadvisability of allowing unrestricted use of starch sugars, based largely (as it seems to be) on the conclusions of the report of 1884. The free use of such materials keeps the community in constant peril; their shortcomings as artificial products are not similar to the shortcomings of a natural product and the unavoidable contact with a crude acid, which, if not a form of sulphuric acid, is probably prepared with its aid, involves both the negative and positive dangers to which I alluded above.

In the light of facts at hand it appears, therefore, reasonable to demand that a careful inquiry shall be made into the uses of starch sugar, and the degree to which such use is made is merely to secure cheapness or convenience in manufacture. If there are purposes for which this product is alone applicable, they are probably very few and limited. It would seem good hygiene and good political economy to forbid its use in all cases in which it merely cheapens the food or beverage, for no substantial good is accomplished by reducing the cost of stable food articles by substitution or adultera-

tion. As in the case of oleomargarin and cottonseed oil, the alleged benefit to the poorer classes is wholly illusory.

THE ANTIGONOCOCCUS SERUM OF ROGERS AND TORREY IN EPIDIDYMITIS.

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In the latter part of November, 1905, H. L., aged 34, a patient of mine at the Good Samaritan Dispensary had been coming for two or three weeks with a primary attack of gonorrhea, when he began to have pain, redness and swelling in the right knee joint. This continued for three days, when I noted that the patient was a very sick man. The knee was much enlarged with an unusual amount of effusion, and I advised him to remain at home in bed and offered to attend him personally at his home, if he would do so. As he was unable to remain at home without working, I sent him to Gouverneur Hospital as being the nearest. A week from that day he walked into the dispensary a perfectly well man, so far as his knee was concerned. In surprise I asked him what they had done to him at the hospital and he replied that they had injected something into his arm for four days and that he had received no other treatment. What this was, I could not even guess, until I read Dr. Rogers' paper on "The Treatment of Gonorrheal Rheumatism by an Antigonococcus Serum" and recognized in his Case 2 the patient I had sent to the hospital. While the serum had had such a startling effect on the man's rheumatism, it had had but little effect on the urethral trouble. Gonococci were present in considerable numbers in the slight urethral discharge, and he remained for some time under my care for an involved prostate and posterior urethritis.

It occurred to me that the serum should be of value in cases of epididymitis, if it were used early enough. Dr. Torrey at the Loomis Laboratory kindly furnished me with the serum as I needed it. Its method of manufacture is given in Dr. Torrey's very interesting paper, page 261, in the same issue of *THE JOURNAL* with Dr. Rogers' Paper.¹ The serum was furnished in sealed glass tubes containing 2 c.c. Some of the serum furnished me was obtained from rabbits and latterly it was obtained from goats. As Dr. Torrey remarked, if the goat serum was found to be of value, its manufacture would be very much less expensive than that obtained from rabbits.

I am aware that several who have tried the serum in gonorrheal rheumatism have not been impressed, and I have heard that it has proved a failure in epididymitis. But this, I think, is to be expected; until the serum has been tried under many varying conditions, until it has been found under what conditions the most potent and valuable serum can be obtained and also under what conditions we can look for success or for failure, there must be cases which will furnish wearying failure. Nevertheless, a remedy which will accomplish what I saw in the case reported above, is too valuable to be lightly thrown aside.

Before it became time to present the results of my work in this paper, I had hoped to have had twice as much material from which to draw inferences as I have; nevertheless, I feel sufficiently encouraged to keep on with its further study.

While making use of the serum, I did not omit any

6. *THE JOURNAL A. M. A.*, Feb. 3, 1906.

of the methods of treatment which have been found of use. In the early stages a 10 per cent. guaiacol ointment with vaselin is used, covering with a fold of gauze, rubber tissue and a carefully fitted suspensory and renewed as often as may seem to be of use; later ichthyol ointment 10 per cent. or ichthyol and glycerin equal parts of each; also injections of argyrol in the deep urethra, when these could be borne. Some patients do well when local treatment is continued, while others do better if all local treatment is suspended. It is a question of judgment.

I treated 13 cases in all, of which only two disappeared; one patient was sent to the hospital and the other did not return after the first treatment. The other eleven were followed the entire time of their trouble. Eight of the patients were treated practically within twenty-four hours of the beginning of the epididymitis, three had had their trouble three or four days. Those having it longer were not treated with the serum, for I believe that, if it is to be effective, it must be employed as early as possible.

I am aware that the number which I present is too small to admit of positive conclusions on account of the varying degrees of severity in the affection itself. Nevertheless, when one has been treating these cases for a number of years, he is in a position to draw conclusions from a smaller number than is possible without that experience. Then, too, without any previous guide one has to learn how often and how many times it is necessary to use the remedy. Three of the patients received two injections twenty-four or forty-eight hours apart, made an apparent complete recovery within a few days and then suffered a slight relapse which required another injection (which, if used before, would very likely have prevented a relapse).

Three of the patients received two injections, four received three, two received four, and two received five injections. The injections were given, as Dr. Rogers gave his, subcutaneously in the back of the arm, the arm being scrubbed with a solution of bichlorid or bichlorid and alcohol. The syringe used was the "Sub.-Q." with a long reinforced needle of 25 gauge. Needles and syringes were always boiled after use, and the needles could be used several times; when they became dull they were thrown away. Some of the cases presented no local reaction, in others there was considerable local edema and some painful reaction, but nothing worse, no abscess, no disagreeable reaction. Sometimes I was loath to re-inject an arm still swollen, so in one case I injected subcutaneously over the abdomen, as we do with the diphtherine antitoxin, but the patient complained of marked pain and soreness for several hours over that site and I did not try it again.

In all the cases but two the patients had no pain after the fourth day except in the three who relapsed. In five patients there was no trace of the disease after complete recovery, no nodule left; in four there was a slight nodule left, and in two there was a large rather soft mass left about the epididymis. Four of the cases were of a severe type from the start. Six of the patients received serum from the rabbit, one from rabbit and goat, and four from the goat.

On a review my impression of these cases is that the serum exerted a distinct effect in all the cases, that the course of the disease was modified by it to a marked degree. The duration of the disease was distinctly

shortened, and in several of the cases the quickness of recovery was remarkable.

CASE REPORTS.

The record of cases is as follows:

CASE 1.—J. S., aged 23, seen March 5, 1906, had a gonorrhea of three weeks' standing. Epididymitis began twenty-four hours before but he was unable to get out of bed; the following morning he pulled himself together and got to the office.

Examination.—Discharge had stopped. Left epididymis exquisitely painful, pain out of proportion to the amount of involvement. Epididymis only slightly swollen, but extremely painful on pressure.

Treatment.—After the dressing was applied, there was considerable relief. Injected 2 c.c. of serum (171). Considerable relief all day. On March 6 he went to work. On March 7 the urethral discharge which had stopped since March 4 returned. There was very little sensitiveness when the dressing was applied. Second injection given (171). On March 10, the sixth day, the discharge was slight, urine in both glasses cloudy. The epididymis was to all appearances entirely well, a very slight thickening at this time being left in the tail of the epididymis. Injection omitted. On March 15 patient came with slight return of pain and swelling, a distinct relapse. Third injection of serum given (170). Two days later, on March 17, epididymis had almost returned to normal. On March 31 there was no trace of there having been an inflammation.

CASE 2.—Dispensary case, March 12, 1906, Ph.D., 24 years old, had gonorrhea for two months, this being the second attack. Epididymitis began 24 hours before, pain in left epididymis and cord very severe.

Treatment.—First injection (170). March 13, less pain. March 14, no pain. Nodule left in epididymis; second injection (170). March 17, hard nodule left in testis; no pain; no injection. On March 24, patient having been absent one week, came with a relapse. Pain was slight and swelling slight in epididymis, but there was considerable pain in the cord, especially in inguinal ring. There was also marked frequency and urgency. Third injection of serum (181). After this for about two weeks patient complained of pain in inguinal canal, but no further injections seemed to be necessary. He was working full time. When seen in the early part of April, a small nodule was still left in the epididymis. He was seen last in May; no trace of the disease left.

CASE 3.—L. S., aged 62, had gonorrhea five weeks. He had had epididymitis 24 hours, on March 12. Right epididymis much enlarged, very painful and tender.

Treatment.—First injection (170). On March 14 less pain, epididymis not so tender; second injection (170). Patient remained quiet at home during the intervals of treatment. March 16, no pain; epididymis hard, but not nearly so tender on pressure; third injection (175). March 19, epididymis slightly reduced in size, improving; fourth injection (175). March 21, no pain, injection omitted. On March 28, i. e., at the end of the second week patient went about in comfort, but the epididymis continued markedly thickened. This was a severe type of case, but I felt sure the serum rendered him more comfortable as to pain, and cut short the trouble.

CASE 4.—L. K., 19 years old, dispensary case, March 12. First attack of gonorrhea, was of 7 weeks' duration. Two weeks before he was threatened with abscess of prostate, which gradually subsided. He had had epididymitis for three days and remained at home during that time. Epididymis of left side was very large and very painful. Cord also involved.

Treatment.—First injection (170). March 14, still much pain, but somewhat less than before, as evidenced when handling the testicle while applying the dressing; second injection (170). March 16, still considerable pain; case evidently of a severe type; besides, injections were not made till third day of attack. Third injection (175). On March 19 patient did not appear; was seen at his home; had high fever and pain in the cord. March 21, he came to dispensary; still great pain in the cord. Pain in epididymis has, however, been absent since March 17. Fourth injection (175). March 24, no pain, patient cheerful and better, no injection. March 26, improving, epididymis greatly reduced in size, patient moves about easily. April 2,

very slight nodule left. May 4, all signs of trouble have entirely disappeared.

CASE 5.—J. P., 22 years old, was seen March 24. He had had epididymitis for three days, gonorrhea two weeks, primary attack. Epididymis large and painful.

Treatment.—First injection (175). March 26, better, no spontaneous pain, swelling reduced one third; second injection (181). March 28, pain very slight, no injection. March 30, still improving, no injection. April 28, slight nodule still left.

CASE 6.—W. W., was seen March 31. He had had internal medication for thirty-one days; primary attack. Patient drove a truck and did heavy lifting. He had had epididymitis for 24 hours, swelling slight, but pain intense.

Treatment.—First injection (187). April 2, no pain when quiet, but great pain when he moved about or rode in the cars (patient came a long distance for treatment, from East New York); second injection (187). April 6, no injection, as both arms were swollen; swelling in epididymis was enormous. April 9, less pain in testicle on handling, swelling reduced one-half. April 16, beginning pain in right epididymis; third injection (187); left side still improving. April 19, right side all right, no trace of trouble on that side, but left side had again increased in size; pain returned to some degree on moving. April 26, left epididymitis greatly improved, but cord had become involved and very painful at inguinal ring; fourth injection (goat serum). May 3, pain at inguinal ring greatly diminished fifth injection (goat). Swelling in epididymis reduced one-half again. Patient took a hot bath every other day. May 17, he had had no pain for two weeks, the swelling was soft, but large, no hard nodules; patient returned to work. May 23, he felt all right. This case was the worst of the series; nevertheless, patient made a distinct gain after each injection. The necessary long car ride was a great handicap.

CASES 7 and 8.—The next two patients received only one injection each. One was sent, by his own request, to the hospital, as he could not remain at home without working. The other did not return.

CASE 9.—B. R., 27 years old, was seen April 27. He had had gonorrhea three weeks; epididymitis 24 hours, swelling large and painful.

Treatment.—First injection (200). April 28, patient said he felt better; no pain, size the same; second injection (200). April 30, no pain, swelling reduced to one-third of former size; third injection (200). May 2, no pain, nodule only left; fourth injection (200). Patient went to work. May 7, slight return of pain and swelling; fifth injection (200). May 9, no pain; patient continued at work. May 12, slight induration left in tail of epididymis, but no swelling of tissues surrounding it and no pain. May 19, no trace in epididymis.

CASE 10.—J. F., 19 years old, was seen May 10. He had had gonorrhea three weeks, primary attack, and epididymitis 24 hours. Epididymis was very painful, pain running up to inguinal ring. Process in early stage.

Treatment.—First injection (goat). May 11, on coming to the dispensary patient felt no pain, but was obliged to wait an hour before my arrival; he became restless and pain set in again; second injection (goat). May 12, no pain, swelling in epididymis of moderate size; no injection. May 15, not seen for three days, pain again returned slightly. Epididymis was more swollen, but not very tender to pressure; third injection (goat). May 16, one week since beginning of attack; no pain, swelling reduced, no injection. May 17, no pain, patient felt perfectly well. Nodulation was very slight; patient not seen since.

CASE 11.—S. W., 21 years old, seen on May 10, had had gonorrhea two months (multiple attack), epididymitis three days. It began slowly and insidiously, was then very painful, but not much swelling.

Treatment.—First injection (goat). May 14, swelling almost gone. No pain. Testicle painted with ichthyol and glycerin, equal parts, dressing applied; no injection. May 16, patient felt so well yesterday that he went to work. At night had return of severe pain in epididymis and cord, and complains of severe spontaneous pain. Tenderness in handling not marked and there is only slight swelling; second injection (goat). May 17, pain greatly diminished, very little swelling; third injection

(goat). No further injection made after this; when last seen, very slight thickening of epididymis noted.

CASE 12.—H. L., 35 years old, was seen May 15. Eight years ago had epididymitis with an attack of gonorrhea. Present attack of gonorrhea began four weeks ago; epididymitis began yesterday. Two injections were made with goat serum on May 15 and 16. May 17, almost no pain, swelling much smaller. May 22, only slight thickening, no pain.

CASE 13.—M. F., 28 years old, was seen May 22. He had had several attacks of gonorrhea. Present attack began five weeks ago. He never had epididymitis before the day previous. He complained of great pain, but process was in early stage, not much involvement. Two injections were given with goat serum on May 22 and 23. May 24, no pain, very slight trace of thickening. May 28, no trace.

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LEGISLATION FOR VITAL STATISTICS IN THE UNITED STATES.

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The condition of registration of vital statistics in the United States has long been a reproach to this country. In a recent discussion in the Royal Statistical Society of England a speaker casually remarked: "In the United States the vital statistics are almost worthless." And he was right, so far as concerns vital statistics covering the country as a whole, and showing, as do those of other civilized countries, the birth rates and death rates from year to year.

The importance of vital statistics, both from a legal standpoint and for the purpose of effective sanitary administration, is not altogether overlooked by us. Certain states have long made effective use of such data. One of the oldest and most efficient systems of registration in this country is that of New Hampshire, and Dr. Irving A. Watson, secretary of the State Board of Health, says in his last report:

All sanitary calculations are based on vital statistics. Without them health officers would be groping in the dark so far as the results of their work are concerned. Sanitary legislation would be largely of a hit-or-miss character. Scientific methods could not be formulated for the suppression of disease. The importance of a given malady as a cause of death could not be determined—in fact, vital statistics are the measure by which we gauge and weigh, with approximate exactness, the movement of a population; whether increasing or diminishing, the mortality from different causes, the effect of seasons, climate, occupation, locality, and other environments on which the health of individuals and communities depends.

The health authorities of Pennsylvania, after long experience in attempting to do sanitary work without a well-equipped system of registration as a basis, adopted the following resolution which has since resulted in the enactment of one of the best registration laws now on the statute books of any state and the admission of Pennsylvania into the registration area:

Resolved, That the achievement of the registration of all deaths, with their causes, immediately after their occurrence, and the prompt return of certificates of death from local registrars directly to the central bureau of vital statistics which shall constitute a part of the organization of the State Board of Health, thereby giving the sanitary authorities of the state timely information of the exact prevalence and distribution of disease, is the most important of all sanitary measures and should be unremittingly urged until successfully carried out in this state.