

transpired in the interval except as mentioned above, the street-car incident.

CASE 3.—July 27, 1898. Mr. M. J. W., age 27, was married nine months. He was a policeman formerly; surveyor at present. Previous health was good. He used liquor to excess up to two years ago, and never used tobacco up to present trouble, and not to excess the last few months; not much tea nor coffee. He had no head injury. In August, 1897, he ran three foot races, the first a mile, the second two and a half miles, and the third three and a fourth miles, and won all of them. At end of last race he was exhausted, and after passing all contestants, still imagined one racer was ahead of him. After race he had slight headache, and pulse 140. Next day he had severe ache over the top of head, and headache irregularly for some time. During fall of last year, about October, he imagined colored people were behind him and would look back suspiciously, no one was really around. He always slept well. About four months ago he fancied some one was too attentive to his wife and he threatened to do them injury. Is quite suspicious. These delusions come suddenly and leave suddenly; in evening more pronounced. He has had some weakness in knees. Knee-jerks are a little exaggerated. Attacks recur about every twenty-four hours, usually in the evenings, and may last an hour or more.

These cases are of some interest from the point of view above stated, and call attention again to the possibility of homicides by persons in irresponsible mental condition. The unique features of the first case lie in the fact that the attempted murder was that of self instead of another, and is without parallel as far as I have been able to learn. It calls up the question as to whether some suicides may not be committed in the psychic equivalent—a very strong inference were the suicide an epileptic.

It should be the duty of all physicians called to testify in murder cases where the mental condition is in question, to inquire most carefully as to the presence of any epileptic tendencies or the occurrence of epileptic attacks; and it should be remembered that the psychic equivalent, as in this case, may precede the ordinary convulsive attack; so that some criminal attacks may be the first evidence of any abnormality in the individual, to be followed later by more convincing proof of the epileptic state. Then again, as pointed out, the malingerer who might attempt to feign this condition should be detected from the history of his case and from a careful examination, if possible, during the simulated seizure. It would certainly be very difficult to uncover the impostor in a feigned psychic equivalent, as the part to be acted requires no particular skill or cunning.

The occurrence of sudden mental aberration in cases like No. 3 is also, I believe, quite uncommon. This result was probably ascribable to the extreme nerve exhaustion or to an altered cerebral circulation, probably congestive, as evidenced by the severe pain on the top of the head. Had this man, on the night after the races, killed his wife, as he was liable to do from some delusion, it would have been a very difficult task at the trial to demonstrate his irresponsibility, owing to the suddenness of the attack. This case should be remembered as an example, rare though it may prove, that great physical strain may be sufficient to temporarily derange the mind.

The alcoholic case, No. 2, though by no means exceptional, reminds us that while a state of alcoholic or drug intoxication does not serve as an excuse for crime, it may be held to extenuate the act. Had this man murdered his wife when he returned home in the evening or at 12 o'clock at night, it would have been done not only without premeditation, but without consciousness per-

haps of the act, as he did not know that he had been at home either during the afternoon or late at night. Normal consciousness seems to have been entirely suspended for a time, during which he was in a state of alcoholic delirium or automatism, without the characteristic alcoholic ataxia. But this is not very uncommon. Some men drink lightly or heavily and at once pass into a state of frenzy or fury, during which they have no recollection of the acts performed at such time.

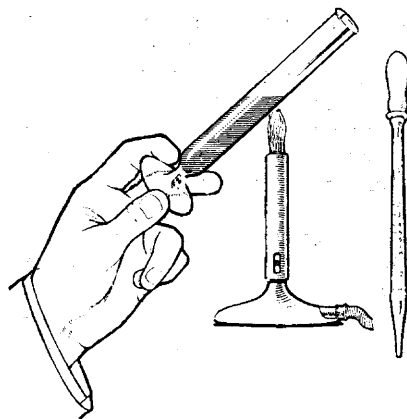
RAPID SUGAR TESTING WITH HAINES' AND PURDY'S SOLUTIONS.

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A search for sugar and its quantitative estimation are necessary in all routine work of urine examination. The well-known Haines' solution for qualitative testing is so simple and trustworthy as to leave nothing to be desired. One dram of the solution is boiled in a test tube, six to eight drops of urine is added, and the boiling continued. If a bright yellow or red precipitate is obtained, sugar is present. With slight practice, one to two minutes is sufficient to in this way gain decided qualitative data.

The methods in use for quantitative estimation of sugar are generally too slow and cumbersome to be of value to the busy practitioner of medicine. He has



either to be contented with the information obtained from a qualitative test, or send to some laboratory where a specialty is made of urine examinations. A method devised by my assistant, Mr. Carl Irenæus, eliminates the tediousness of the standard methods, and gives rapid and accurate results. The only apparatus required is that shown in the accompanying illustration, viz., a graduated test tube and pipette, and a Bunsen burner or spirit lamp.

When the presence of sugar in the urine has been determined, as by the Haines' test, fill the test tube to the 12 c.c. mark with Purdy's solution, and the pipette to the zero mark with the urine to be tested. Heat the test solution to boiling, and add the urine drop by drop in the test tube, boiling for a few seconds after the addition of each drop, until the blue color has entirely disappeared, trying to decolorize with the smallest possible quantity of urine. If less than 0.2 c.c. of the urine is required to decolorize the test, the urine contains above 4 per cent. of sugar, and should be diluted with an equal volume of water, and the results obtained multiplied by two. The subjoined table gives all ratios of reduction from one-half of 1 per cent. up to 4 per cent., calculated to each quarter per cent., with corresponding grains per ounce.

After slight experience with this method, the time required to make a complete qualitative and quantitative test need not exceed five minutes. This method has been carefully compared with the standard methods of sugar testing, and results have been found fully equal to those obtained by the standard methods. It was used for years by Mr. Irenæus in the laboratory of the late Dr. Charles W. Purdy in all cases where rapid results were required.

Cubic cm. Urine.	Per cent. Sugar.	Gr. per oz.
.2	4	19.2
.225	3.75	18
.25	3.5	16.8
.275	3.25	15.6
.3	3	14.4
.325	2.75	13.2
.35	2.5	12
.375	2.25	10.8

103 State Street.

TRAUMATIC ARTERIO-VENOUS ANEURYSMS OF THE SUBCLAVIAN VESSELS.

WITH AN ANALYTICAL STUDY OF FIFTEEN REPORTED CASES, INCLUDING ONE OPERATED UPON.

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(Concluded from page 247.)

PRACTICAL CONCLUSIONS.

As a result of the study of the arterio-venous aneurysms of the subclavian vessels which we have summarized in this contribution, we find that this class of injuries can be separated clinically and surgically into three distinct and well-defined groups:

1. The immediately fatal cases in which death follows so quickly after the injury from the effect of the primary hemorrhage and shock that no effective surgical assistance can be rendered. These probably constitute the largest proportion of cases, especially in military practice, though an exact estimate can not be obtained. It is also probable that the vast majority of injuries involving the first and second divisions are fatal primarily, and are to be included in this group, except when the injuries are caused by small projectiles or sharp-pointed weapons.

2. In this second group, primary hemorrhage may be very great, but spontaneous or temporary hemostasis occurs in the syncopal state, which favors the formation of a provisional thrombus. In this class of cases two events may occur which will profoundly modify the prognosis. In the one case (*a*) secondary bleeding will set in within a few hours or, more often, days—usually within the first week—with disastrous consequences, unless the patient is rescued by prompt operation or other form of intervention. The other alternative (*b*) justifies the formation of the following group.

3. In this group the primary hemorrhage may also be excessive, but, as a rule, is moderate and is readily controlled by pressure, or may be spontaneously arrested as in the second group. More often there is no syncope, because the external hemorrhage is slight. There may be a large hematoma. No secondary hemorrhage occurs, the wound heals up, leaving a well-defined and permanent arterio-venous aneurysm.

The arterio-venous circuit is usually promptly established by direct inosculation between the artery and vein (aneurysmal varix), or by means of an intermediary sac (varicose aneurysm), the fistulous communication between the vessels acting in both cases as a safety-valve by which the dangers of further extravasation are to a large extent permanently avoided.

Rötter, in his paper published in 1893, analyzes 13

cases of stab wound of the subclavian vessels, 5 of which were arterio-venous, including the one which he reports, in which he operated for secondary hemorrhage following an injury to both vessels.

He found that in 6 cases the hemorrhage was spontaneously arrested, and no secondary hemorrhage occurred; but in all of these, secondary traumatic aneurysm developed, which impaired the usefulness of the arm, either partially or completely, and led to grave secondary complications which subsequently imperiled life.

In seven cases, the larger number, repeated secondary hemorrhage occurred, and the result was far more serious, for all these patients except Rötter's—an arterio-venous injury—died, and this one was saved only by prompt and desperate operation undertaken at midnight. As a result of this inquiry, Rötter advocates immediate operation—*i. e.*, ligation of the injured vessels at the bleeding point as quickly as possible after the patient has recovered from primary shock and hemorrhage, without waiting for the appearance of the secondary hemorrhage which might prove fatal. The only objection to Rötter's recommendation is that it is based upon the study of mixed cases of simple arterial and arterio-venous injuries, and not sufficient stress is laid upon the more favorable tendency displayed by the arterio-venous injury when these show an early disposition to form aneurysmal varices.

The relative benignity of arterio-venous aneurysms when fully developed—*i. e.*, when the communication between the artery and the vein has become distinctly and permanently established—has led, as Poincot correctly remarked in 1882, to the general acceptance of a fallacious doctrine that in wounds of a single vessel, such as the subclavian artery, the simultaneous lesion of the satellite vein was a safeguard to the life of a patient.

For instance, Moore,⁶ in commenting upon Larrey's case, said the patient's "life appears to have been saved by the singular circumstance that the vein was also pierced by the lance (saber), which wounded the artery. The blood from the latter vessel, when restrained from passing through the external wound, escaped into the vein, and was thus saved to the system until the wound healed." The explanation, says Poincot, is as fantastic as the pretended benignity of the injury is contestable.

If the simultaneous lesion of the artery and vein is apparently less dangerous statistically than injury of the artery alone, this is due to the fact that in many immediately fatal cases the existence of the double injury is not recognized until after death or only in the cases in which the patient survives and the anastomosis has had time to form or an operation has been performed for repeated hemorrhage. Whatever the doubts entertained on the subject, the cases of Will, Rötter, and Veiel alone suffice to prove that the old teaching as to the relative benignity of double injuries is not to be trusted. One fact, however, must be admitted, as we have conclusively shown in our table, and that is that once the arterio-venous connections have been firmly established, these injuries, as a class, are less dangerous to life than the traumatic aneurysms involving the artery alone.

TREATMENT.

In dealing with these cases practically there are three questions that now present themselves for discussion or consideration: 1. What is the best treatment that can be applied to arrest the primary bleeding at the time of

6. Holmes' System of Surgery. Edit. 1894.