

AMERICAN ENGINEERS' ASSOCIATION.

[Reported expressly for the Scientific American.]

On Wednesday evening, Nov. 28th., the usual weekly meeting of this association, under the new constitution, was held at its room, No. 24 Cooper Institute, this city—Henry E. Roeder, chairman *pro tem.*; Benj. Garvey, Secretary.

The regular subject—"Ashcroft's Low Water Detector"—was here taken up.

DISCUSSION.

Mr. Koch—During the discussion upon the utility of this instrument on last meeting night, it was asserted that, although sediment or corrosion had collected upon the plug of the one in use at the Cooper Union, it would still melt, and that at the proper time. Since then we have had another opportunity of inspecting this plug, and now beg leave to submit it to the members present. It will be observed that a portion of the plug is full of sediment. Now, the question arises whether this feature will hinder the action of the plug as intended.

Mr. Gray—The representative of Mr. Ashcroft has said he would give a large sum to any one who could procure a plug that would not fuse, after many months use, and that the one now before us would certainly melt. The surface of it is coated to such an extent that, to me, it seems very doubtful. I should like this point settled.

Mr. Koch—I would request that the plug be passed around among the members, that each may decide in his own mind whether the portion thus coated will fuse.

(Here the plug taken from the instrument in use at the Cooper Union was passed among the members by the Secretary. A thick coating of sediment or mud had settled in the branch tube and upon the bottom of the plug.)

Mr. Merriam—The mud being deposited in the branch tube certainly presents a serious fault. The sediment being a poor conductor, it would prevent the plug from fusing at the proper time. I have ascertained, since our late discussion, that the instrument that gave an alarm at the Astor House with the cocks of solid water, could not have whistled, but merely made a hissing noise, easily distinguished from an alarm when made by steam.

Mr. Garvey—The fact was stated it blew, not hissed; that there was sufficient generated steam within the tube to keep the whistle blowing.

Mr. Stetson—It seems hardly fair to judge of the value of the instrument because of the deposit of mud upon this plug. If the sediment prevents the transmission of heat, the metal surrounding it will radiate sufficient to melt the plug.

Mr. Gray—How long a time would that require? Some boilers are so peculiarly constructed that, in the time necessary for the transmission of the heat by radiation, great damage might be done, and perhaps lives lost.

Mr. Merriam—Iron is not such an excellent radiator of heat that it would raise it to such a point necessary to fuse the plug. This feature could never be depended upon.

Mr. Pitt—How long has this plug been in use?

Mr. Gray—But a little while; some five or six times; and the plug was detached from the instrument this evening about eight o'clock.

Mr. Koch—Mr. Ashcroft is not in town; but his representative (Mr. Hart) was requested, upon last meeting night, to be here this evening, and it is curious, to say the least, that he is absent.

Mr. Merriam—Mr. Hart waited upon me last week and signified his intention of being here this evening. He also wrote Mr. Ashcroft, in relation to the proceedings of this society, in reference to his detector.

Mr. Gray—Two months ago, in examining the plug now before the society, I discovered a number of little specks upon it. Yet I am much surprised to see it so nicely coated at this period. I thought it would require years to cover it in such a manner.

An argument then ensued upon the compressed air within the ball, and as to whether, if the warm water at the bottom would not replace the cold at the top, a still thinner fluid, such as steam, would replace it; and did not the tube of the detector partake of the nature

of a barometer. The following is the gist of these remarks:—

Mr. Gray—How does cold water find its way to the ball at the top of the instrument?

Mr. Koch—As soon as steam forces the water up to the globe, the inventor contends that it remains there—that there is no circulation of it, and thus, with the tube and ball being exposed, the water becomes cold. At the trials at the Cooper Union, the time that elapsed between letting the water down to the alarm point, and when the whistle blew, when the tube was full of compressed air, was sufficient to blow up the boiler fifty times; but upon the second attempt, when that air was absorbed, the detector started and worked very nicely.

Mr. Babcock—Water will circulate when in such a condition. I have witnessed experiments which have demonstrated this fact. A pipe some three or four feet in height, with an internal diameter of three-quarters of an inch, connected with a boiler by a horizontal branch piece six inches in length, having a glass top, showed that water and steam would rapidly change their positions, and *vice versa*.

At this period, Mr. Hart entered the room.

Mr. Stetson—One question arises—it is this: What means are adopted to insure the rapid and certain exchange of steam for water when the water falls below the alarm point?

Mr. Hart—The way we know that it does is by experience and practical illustration.

Mr. Pitt—How does the gentleman account for the large collection of sediment upon the plug just handed him?

Mr. Hart—I have understood that the boiler is only occasionally used, and the only reason to which I can attribute it is because of the non-working of the boiler. This would give an opportunity for the presence of a large volume of air in the tube—

Mr. Koch (interrupting)—Is that a deposit of air upon the plug? (Laughter.)

Mr. Hart—No, sir. I should call it rust. I have never seen one like it before.

Mr. Koch—This discussion seems to me to be a very curious one. Mr. Hart attributes this deposit to the non-working of the boiler. Now, sir, this deposit is actually rust, and the more the boiler is used the greater will be the deposit.

Mr. Hart here arose to explain that, having but little experience with the instrument, he was not capacitated to answer all the questions the members asked; that he came there only to explain the operation of the detector, as well as able, during the absence of Mr. Ashcroft, who was in Boston, in attendance upon a sick member of his family.

Mr. Koch—To me, there seem to be two points to consider, viz.: Will the air in the globe really be absorbed by contact with the water, and will the plug be hindered from fusing by the coating it has received? If the air within the tube is not absorbed, it will act as a cushion to the water, and its falling will be so tardy, it will always be a matter of great danger. If the deposit upon the one end of the plug will not hinder the balance of it from fusing, this question may be answered favorably; but if this deposit is corrosion, it will utterly fail to answer the purpose intended.

At this juncture, much discussion arose in relation to the disposition of the subject. The society had taken up two entire evenings in reference to the utility of the detector, but because of the divers opinions of its members, had failed to reach a point where a vote could be taken upon the committee's report. The committee asked to be discharged from the further consideration of this particular question, which was granted. It was decided that a new committee should be appointed, upon whom would devolve the duty of obtaining new facts, new opinions, &c., and to test, by further experiments, its utility for the work intended. To this end, the representative of Messrs. Ashcroft & Co. promised to supply an instrument simplified in its many parts, to allow the committee, by additional experiments, to determine upon the points in issue; further, he promised to do everything in his power to facilitate the investigations.

After several ineffectual attempts to obtain a new committee from the members present, the chairman postponed the entire matter to the subsequent meeting.

There was, seemingly, an evident dislike, on the part of the members, to serve upon this committee. The reason of such disinclination was not apparent, except that the respective business of the gentlemen precluded the possibility of their devoting as much time to it as the importance of the case demanded.

The subjects for consideration at the next meeting will be "Warren and Bank's Low Water Detector," and "Shrimpton's High Pressure Condenser."

On motion, the association adjourned.

SLEEP.

Dr. Cornell, of Philadelphia, contributes to the November number of the *Educator* an article on sleep, from which we make the following brief extracts:

No one who wishes to accomplish great things should deny himself the advantages of sleep or exercise. Any student will accomplish more, year by year, if he allows himself seven or eight hours to sleep, and three or four for meals and amusements, than if he labors at his books or with his pen ten or twelve hours a day.

It is true that some few persons are able to perform much mental labor, and to study late at night and yet sleep well. Some require but little sleep. But such individuals are very rare. General Pichegru informed Sir Gilbert Blane that, during a whole year's campaign, he did not sleep more than one hour in twenty-four. Sleep seemed to be at the command of Napoleon, as he could sleep and awake apparently at will.

M. Guizot, minister of France under Louis Philippe, was a good sleeper. A late writer observes that his facility for going to sleep after extreme excitement and mental exertion was prodigious, and it was fortunate for him that he was so constituted, otherwise his health would materially have suffered. A minister in France ought not to be a nervous man; it is fatal to him if he is. After the most boisterous and tumultuous sittings, at the Chamber, after being baited by the opposition in the most savage manner—there is no milder expression for their excessive violence—he arrives home, throws himself upon a couch, and sinks immediately into a profound sleep, from which he is undisturbed till midnight, when proofs of the *Moniteur* are brought to him for inspection.

The most frequent and immediate cause of insanity, and one of the most important to guard against, is the want of sleep. Indeed, so rarely do we see a recent case of insanity that is not preceded by want of sleep, that it is regarded as almost a sure precursor of mental derangement.

Notwithstanding strong hereditary predisposition, ill-health, loss of kindred or property, insanity rarely results, unless the exciting causes are such as to produce a loss of sleep. A mother loses her only child, the merchant his fortune, the politician, the scholar, the enthusiast, may have their minds powerfully excited; yet if they sleep well, they will not become insane. No advice is so good, therefore, to those who have recovered from an attack, or to those who are in delicate health, as that of securing, by all means, sound, regular and refreshing sleep.

To the discoverer of the law of gravitation—Sir Isaac Newton—we also owe the first distinct philosophical elucidation of the great chemical law of affinities. "Sugar," said he, "dissolves in water, alkalies unite with acids, and metals dissolve in acids. Is not this an account of an attraction between their particles? Copper dissolved in aquafortis is thrown down by iron. Is not this because the particles of iron have a stronger attraction for the particles of the acid than those of copper; and do not bodies attract each other with different degrees of force?"

THE MOST IMPORTANT RULE IN SHOOTING A RIFLE.—In shooting a rifle, if you press the trigger gradually, so as not to know the precise second when the piece is to be discharged, you will avoid the nervous start which is the most common cause of failure to hit the mark.

OUR thanks are due to Mr. John C. Merriam, Corresponding Secretary of the American Engineers' Association, for the particulars kindly furnished us in relation to the experiments upon the expansion of steam by the Naval Commission.