

No. 2, writes as follows: At the regular instruction meeting a very interesting time was spent, and a valuable paper was read by Mr. McKinley, chemist on "Boiler Compound", also one by Bro. G. W. Mackie on the "Rivals of the Steam Engine." We intend having a series of these meetings through the winter, and the committee in charge is likely to make them a grand success. The following is Mr. McKinley's paper:

In considering the value of boiler compounds two things should always be known—first, the nature of the scale, second, the chemical and solvent action of the mixture on that scale. The scale on the boiler represents the insoluble part of the total solid of the water used, with the suspended mineral and vegetable matter. As these insoluble salts differ both in quality and quantity in various waters, so must the quantity and amount of the scale for need vary. In some districts the amount of insoluble solids in a water will be represented by from 2 to 5 grains per gallon, others from 20 to 25 and even higher, thus showing that it is unprofitable to use the same amount of boiler compounds in all localities. It may be supposed that scale is formed only by precipitation from the evaporation of the water, to such an extent that all the total solids are thrown out of solution, but the precipitate begins to form long before this. When a solution containing the insoluble salts of lime, carbonate hydrate and sulphate is raised to the boiling point, approximately half of the salts are precipitated without any evaporation, because the lime salts are much less soluble in boiling than in cold water. Hydrate lime soluble in cold water, 750 parts hot, 1,650 parts; sulphate lime soluble in cold water, 400 parts hot, 500 parts; carbonate lime soluble in cold water, 23,000 parts hot, 40,000 parts. There is no doubt that most of the scale is formed during the night when the water is in a quiet state, as it then has a better chance to become firmly attached to the flues and sides of the boiler. The chemical nature of the scale for the Hamilton district may be represented by: Carbonate of lime, 65 per cent; carbonate of magnesia, 20 per cent.; sand 3 per cent; sulphate of lime, 4 per cent.; oxide iron and alumina, 2 per cent.; invixture, 6 per cent.; total, 100. In a boiler or series of boilers using, say, 1,000 gallons of water per day, the deposit would be for Hamilton district 9,000 grains of one pound, or in one week six pounds. There can be no doubt that in blowing off most of this is removed, but the layer in immediate contact with the metal is not disturbed. In a boiler with thick, hard scale, the cheapest way to remove it is with a chisel or instrument for the purpose, then follow with a good compound. In a clean boiler a good compound should prevent the precipitate from settling into a hard state and prevent it from growing. It must be remembered that it is easier to prevent a precipitate than to dissolve one when formed, and also in a hard slate-like scale only the surface is acted upon; while the precipitate is suspended it is subjected to the full action of the solvent. A boiler compound may have a three-fold action, a slight chemical, a solvent and a mechanical action. This slight chemical action may change some of the salts and thereby retard the formation of scale; but in the majority of cases the solvent and mechanical action are the two important factors. The best solvents are caustic soda, chloride, ammonia, hyposulphite soda, chloride soda and sulphate of ammonia. The best mechanical agents are bark extracts, molasses and glycerine. In all probability the most effectual work of a compound is to keep the precipitate from settling hard. Suppose you have a week's precipitate or seven pounds in the boiler, and you have used through the week four gallons of a compound, carrying eight pounds of caustic soda, chloride soda, etc. These salts having a strong affinity for water, keep the precipitate soft, so it is readily detached when blowing off. If the precipitate consists of clay and sand, with a small percentage of lime, salts, bark extracts and molasses are the most satisfactory things to use. When the water contains carbonate of lime I would not advise using carbonate of ammonia or soda in the compound, as carbonate of lime is very insoluble in water containing alkali carbonates, the solubility being about one in 65,000 parts. I submit the following formulas for compounds. No. 1—Caustic soda, 30 pounds; (salt) chloride soda, 30 pounds; oak bark extract, 5 pounds; water, 15 gallons. Use two gallons twice a week. No. 2—Chloride ammonia, 10 pounds; molasses, 50 pounds; water, 10 gallons. Use two gallons twice a week. In the discussion that followed Mr. McKinley said that he thought there was no composition with which a boiler could be painted to prevent scale from adhering; also that sal soda (washing soda) helped rather than prevented scale. G. W. Mackie's paper was then read on the "Rivals of Small Steam Engines." The rivals mentioned were the gas or explosive engine, compressed air motor and electric motor. He explained their action and relative cost per indicated horse power per hour.

CARLETON PLACE AND PENETANGUISHENE MOVING.

Bro. A. E. Edkins writes, under date 27th October:—

"I have for some time been in communication with engineers in Carleton Place with a view to starting a branch of the C.A.S.E. there, and I am pleased to be able to report that on October 20th a meeting of engineers was held in Cliff's Hall, and the advisability of forming a branch association was fully discussed. A committee was appointed to interview all engineers in the vicinity and ask them to attend a meeting to be held October 27th for the purpose of organization. I am expecting to receive the names of charter members shortly, and it is very probable that Carleton Place, No. 16, will be instituted about the same time as Brockville, No. 15.

"The engineers of Penetanguishene are also thinking of organizing. I saw Bro. Coady a few days ago, and he has been up there talking to them, and we expect soon to see an association there.

"ALBERT E. EDKINS,

"Prov. Dep. C.A.S.E."

#### THE BROCKVILLE BRANCH.

Before THE CANADIAN ENGINEER goes to press next month, I hope to be able to report the organization of new associations in Brockville and Carleton Place. I have visited Brockville a number of times, and often tried to interest some of the engineers in forming a branch of the C.A.S.E. there. I was there on business about the latter part of August, and met Mr. W. F. Chapman, chief engineer for the Brockville Carriage Company (whose kindness to the writer will never be forgotten), and I took the responsibility of inviting him up to Toronto to attend the convention, which he did. On returning home again, he at once commenced work in earnest, and, after a few communications with him in reference to organization, I was most pleased to receive an application for a charter. I am just in receipt of a full list of officers and members from Mr. James Aikins, the secretary-elect of the new association. The association will start with sixteen charter members, composed as follows: W. F. Chapman, president; George Whitney, vice-president; James Aikins, recording secretary; Chas. Bertrand, financial secretary; A. H. Franklin, treasurer; Edward Devine, conductor; Albert E. Henry, doorkeeper; M. Turkington, J. Grundy, E. Carr, trustees; James Runnings, R. Turkington, W. Robinson, James Window, W. Stanley Beaverstock, and D. G. Donovan. Several other engineers in the vicinity have signified their intention of joining the association when it is organized. Brockville Association No. 15 will be a valuable addition to the order, and under the direction of their worthy president, Bro. W. F. Chapman, its success is fully assured. I am pleased to see the name of A. H. Franklin among the officers as treasurer. Bro. Franklin is a veteran engineer of over forty years' standing, and at the present time is chief engineer in the Brockville water works. I shall be glad to hear from engineers in other towns where there is any prospect of starting associations, and will give them the necessary information with pleasure.

ALBERT E. EDKINS,

Prov. Dep. for Ontario, 139 Borden-st., Toronto.

#### SECESSION IN MONTREAL.

A meeting of St. Laurent Branch, Montreal No. 2, was held on 29th Oct., to discuss matters of difference that have lately arisen between some members of this branch and the executive. The executive president, John J. York, presided. It appeared that a majority of the members of this branch wished to form a mutual benefit association as a part of the existing organization, but this subject was discussed at the recent convention in Toronto, and it was the opinion of the majority that it would be unwise to make such a departure from the primary idea of the association as a means of education and mutual improvement. At the present meeting the members who wished to form the mutual benefit association insisted on carrying out their plan, and the result was a secession of those members. Mr. York expressed his great regret at their action, and thought that the seceding members would find they were throwing away the substance for the shadow in withdrawing from the community of engineers and embarking in a scheme of doubtful financial advantage. Some ten or eleven members announced their intention of remaining faithful to the association, and they retained the books and property, so that "St. Laurent No. 2" still exists, and will no doubt attract a number of new members, while, perhaps, regaining some of the seceding ones, as experience may show what advantages have been lost. Very few expressions of unfriendly feeling found utterance from the seceding members, who have quietly formed themselves into a "Société Mutuelle d'Ingenieurs Mecaniques de la Province de Quebec" (Mutual Society of Mechanical Engineers of the Province of Quebec). It may be stated that both the seceding and remaining members of this branch are French-speaking.

At the last meeting of Montreal No. 1 it was announced that preparations are being made for a series of lectures on subjects connected with steam engineering, to be given at intervals during