

New York Agricultural Experiment Station.

(*These series of frequent reports are intended to inform the public of progress at the Station rather than to give complete results.*)

BULLETIN NO. VII—NEW SERIES.

N. Y. AGRICULTURAL EXPERIMENT STATION, }
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SLUG SHOT.

Nearly two years ago a sample of Hammond's Slug Shot, an insecticide of some repute, was sent to the Station for examination as to its poisonous properties, the claim having been made that it was perfectly harmless to all animals except insects and consequently could be used with impunity on all fruits and vegetables.

This insecticide is in the form of a fine powder having a pinkish color and an odor resembling coal tar. The color and the odor, together with the strong reactions given in tests for lime and arsenic gave the impression that the substance was a mixture of gas-lime and London purple, and a statement to this effect was made at the time. This was not intended to be a positive statement of its composition, and was made simply because it afforded a plausible explanation of its appearance and odor and also suggested a cheap source for the arsenic which it contained. It was not considered necessary to proceed further with the examination after dangerous quantities of arsenic had been discovered.

This explanation is rendered necessary by the fact that the appearance of the above statement as to the probable composition of the Slug Shot in a late report of the Station was followed by an affidavit from the manufacturer to the effect that at no time had either London purple or gas-lime entered into its composition.

A recent circular issued by the maker reaffirms the statement that Slug Shot "is a combination * * not harmful to either man, beast or fowl, but probably the most effective and economical article in use for the destruction of the various insects that prey upon cultivated vegetation." The printed directions upon each package also state that "It contains poison thoroughly diffused through natural and chemical fertilizers and is perfectly safe in its use no matter how bountifully applied." This same impression, as to the harmless properties of this insecticide, is conveyed by the affidavit mentioned above. This claim, on account of the strong reaction for arsenic which had been found, was considered misleading and liable to result in serious accidents if not corrected, and a further examination was undertaken for the purpose of determining the quantity and if possible the source of the arsenic.

A few tests showed that the main portion of the substance was gypsum, and determinations of water, sulphuric acid, and lime were made which fully confirmed this.

A microscopical examination showed a reddish coloring matter, and numerous green particles insoluble in water suggested Paris green as the probable source of the poison. To confirm this opinion a test for copper was made which showed its presence in considerable quantity. In order to obtain a clue to the quantity of Paris green which the copper represented, the color imparted to a solution of ammonia by a given weight of Slug Shot was compared to that produced in the same strength of ammonia by Paris green. The comparison showed that one part of Paris green was equivalent to about one hundred parts of Slug Shot. A determination of arsenious acid in this same sample (No. 1) which was received two years ago, gave 0.54 per cent.

On Feb. 4, 1886, when the investigation had reached this point, two more samples of Slug Shot (Nos. 2 and 3) were received from the manufacturer. Externally the packages were the same, except that No. 3 was put up to be sold by Joseph Breck & Sons, Boston, Mass. The general appearance of the substance in both of

these packages was quite similar to No. 1, although the color was slightly darker and the odor somewhat different; a more careful examination, however, showed that they were different in composition. No. 1 was quite free from organic matter, while both Nos. 2 and 3 contained a considerable quantity of a fine organic powder which it would be difficult to fully identify, but when it is digested in water for some time and gently warmed, the odor is very suggestive of tobacco. This was the same in both No. 2 and No. 3. The organic matter which these samples contained so modified the color produced by ammonia that, no definite idea of the amount of Paris green used could be obtained by direct comparison as with No. 1; the color was, however, much deeper, showing that they contained more than that.

A determination of the arsenious acid in No. 2 gave 1.02 per cent. and in No. 3, 0.76 per cent. Paris green as obtained in the market is not of very constant composition, but the above figures indicate that No. 1 contained about one per cent., No. 2 two per cent and No. 3 one and one-half per cent. These quantities are larger than necessary for an efficient insecticide. Experiments at the Station have shown that one part of Paris green to 100 or 150 parts of land plaster is ample for the destruction of the potato beetle.

The quantity of arsenic found in these samples is certainly sufficient to demand especial care in its use at all times and to warrant the recommendation of its discontinuance upon cabbage and all other vegetables and fruit where it is possible for a portion of the poison to be retained until it reaches the table. When it is considered that one grain of arsenious acid is a dangerous dose, and that a tablespoon full of any of the above samples would contain more than this quantity, the necessity for caution in its use will be evident to all.

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