## A MACHINE THAT SMOKES CIGARS. BY C. H. CLAUDY.

At first sight it would seem that the most brilliantly unnecessary of inventions is a device to smoke cigars. Nevertheless, such a device has a purpose of its own, which it fulfills with precision and dexterity, for the simple reason that it smokes cigars with an evenness and regularity that the most hardened smoker could not emulate. The purpose of the cigar-smoking machine is to show the comparison of the "burn" of different cigars smoked under identical conditions. No

man could possibly smoke two cigars alikegiving the same number of puffs to each, the puffs all the same length and strength, and with the same interval between each puff. Consequently, if one cigar burned worse than another, the tobacco expert could not be sure it was the tobacco which was at fault, and not some unevenness in the "man behind the smoke." With the machine. however, everything is automatic, and one cigar is smoked under identical conditions with its neighbor.

The birthplace of the machine described and illustrated here was in the Bureau of Plant Industry, Department of Agriculture, which bureau is making a systematic effort to improve the quality of the tobacco crop of this country by "employing the latest and most approved methods of selection of the old varieties, and by creating and establishing new strains possessing in a marked degree those characteristics most to be desired in the various classes of tobacco

which the market demands." A cigar is made up of three parts-the filler, or body of the cigar; the binder, a leaf which holds the filler in position, and the wrapper, or outside leaf, which still more firmly holds the shape of the whole, gives it a finish, and in a measure controls the "burn."

As the final test of any cigar is the smoking of it, the "burn" is a most important quality of any leafits evenness, its speed, its time of holding fire, its coaling, the quality of the ash, the puckering of the wrapper behind the burning end, all entering into that quality called the "burn." It is for testing the "burn" of different cigars, and of cigars made with some elements similar and some different, as one filler wrapped and bound differently, or different fillers wrapped and bound similarly, that the cigar-smoking machine is used.

It is possible that some may quarrel with the word "machine" used in this connection-the device partaking of the nature of chemical and physical apparatus. But surely any piece of mechanism which is automatic in its action, and which performs a piece of

work in a prescribed manner, is a machine in the true sense of the word,

This machine, then, consists first of a means for holding the cigars to be smoked, secondly of a means of producing the pull, and thirdly of a means for making the pulls intermittent. A s seen in the illustration, the cigars, four in number, are stuck into glass tubes with enlarged ends, similar to ordinary cigar These holders. tubes are bent at right angles, and enter a fiask through a cork, their ends, all the same length, dipping beneath the surface of the liquid contained in the bottle. A tube leads from this

## Scientific American

is prevented from returning to the cigars by the second flask or water valve, which thus fulfills its function. When the aspirator is filled, the syphon which it contains commences to work, and as the outlet pipe of this syphon is much larger than the inlet pipe for water, the aspirator empties faster than the water fills it. The syhon is so arranged that it "breaks" the water at the bottom of the aspirator, whereupon the aspirator refills. As the water empties from the aspirator, air is drawn through the valve fiask from the cigar-holder fiask, and that air enters



Variations in Fillers Shown by the Smoking Machine.

the apparatus through the cigar holders. Obviously, if lighted cigars are in the holders, the air passing through them will make them burn, exactly as if the drawing power were a man's mouth.

The device smokes four perfectos at once, and if they be of average size, five inches long, will do it in about half an hour. This is somewhat more rapidly than the average man will smoke, but near enough for all practical purposes. The pull on the cigars occurs at intervals of half a minute, and continues ten seconds.

Usually, when a man smokes a cigar and it does not burn well-if one side gets consumed faster than the other-he is inclined to think it either a poor cigar or that it was poorly lit. But the quality of the tobacco may be good and the cigar properly lit, and still the and the test is much more accurate and complete. The wrappers are wrapped around a collapsible tube, which. when the wrapper is dry, is collapsed and withdrawn, leaving the hollow cylinder of tobacco leaf on the glass tube which is part of the apparatus.

Of course, these experiments are academic as yetbut preliminary apparatus making and lengthy experimentation are always necessary to produce results. It is not hard to foresee how such experiments will act if carried out to their logical conclusion. Mention might be made of the seed-separating device,

> which was the result of the discovery that tobacco plants grown from the heavier seed were both more hardy and better grown than the others. This device, which is simplicity itself, and is now largely used when extra-fine plants are wanted, is also illustrated. It consists of two sections of glass tube, with suitable connections, a foot bellows connected to the lower tube, and a valve for regulating the amount of air which is pumped in. The mixed seed is put in the lower tube, the large one above is inserted, and air is pumped in. The smaller and lighter seeds fiy out of the top of the long tube, and the heavier remain behind. The size of the seeds thrown away is of course governed by the length of the long tube and the pressure of the air. The greater the length of the tube and the less the air pressure, the lighter the seeds which are discarded.

> The cigar-smoking machine and the wrapper-smoking device it is hoped will produce

some great practical results. The tobacco crop in this country being of such great value, and representing such enormous capital, is thought to be an excellent subject for investigation, and the trained force of the Bureau of Plant Industry is doing all in its power in its home laboratories and field experiment stations to bring to the service of its scientists an exact lot of statistics, by which tobacco plants can be bred and improved as cattle are bred and improved-a process which, if successful, will revolutionize tobacco growing. The cigar-smoking machine, in spite of its element of the humorous and grotesque, is one of the first steps.

## Effect of Ballooning on the Vision.

Some valuable experiments have been carried out by Dr. Robert Daulnoy, the well-known Parisian eye specialist, concerning the effects of ballooning at varying altitudes upon the human visual system. The first investigation was carried out at an altitude of 6,000 feet. A bottle was fiung overboard into a lake beneath. The occupants of the car were able to follow with ease the descent of the bottle through the air,

> watch the neck of the vessel as it disappeared into the water. The balloon then soared to a greater height, and by examination the doct o r ascertained that at this altitude there was a considerable d i · minution of the pressure on the visual organs. The pupils distended. and the sensibility of the optic nerve was appreciably increased. As a result of his observation Dr. Daulnoy is opinion that certain diseases of the eye, if treated







**Tobacco Seed Separator** in Use. The seed is collected in the lower section of the glass tube.

bottle to a second bottle, and from a T-joint continues to an aspirator-a flask containing a syphon. A third tube from the second or valve flask extends upward and away, carrying off the smoke. Behind the cigars is a screen of white paper, so that the cigars may be compared easily, and the character of ash and smoke noticed without trouble.

The operation of the device is as follows: Water from a constant-level tank is allowed to enter the aspirator from the top. The aspirator fills; the air or smoke it contains passes out of the outlet tube, and



Cigar-Smoking Machine Which Tests the Qualities of Fillers, Binders, and Wrappers.

## A MACHINE THAT SMOKES CIGARS.

cigar-smoking machine, or rather a wrapper-smoking machine. In this device the pull is continuous, from a filter pump, and the wrapper is hollow, and has nothing in it. The burn is supported by the indrawn column of air. Formerly such tests were made by simply lighting the leaf and observing the action of burning in the air without a draft, but the test was inaccurate and unfair, inasmuch as a vein might stop the burning, or some part of the leaf burn longer than the rest. Here the indrawn column of air serves to support the burning, as does the filler in the actual cigars.

at a high altitude in rarefied atmosphere, would be more beneficial. and attended with greater possibilities of success, than is now the

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and also able to

case. Especially would this be so in treating the maladies glaucoma and choroiditis, or the releasing and loosening of the retina, which are two common eye complaints. Owing to the increased sensitiveness of the optic nerve in the purer rarefied air, the action of the liniment or lotion which is dropped into the affected eye under such conditions would be attended, it is maintained, with astonishing results.

San Francisco is to have a fifteen-story building of which all the walls are to be of steel plates.