

Correspondence.

The Rawhide Cannon.

To the Editor of the SCIENTIFIC AMERICAN :

Referring to your account of a rawhide cannon in a recent issue, I would say that the inventor is wasting both his time and his money. Any greater lightness in field guns is undesirable and would seriously injure their accuracy. Guns considerably lighter than those now in use could be safely made from good steel, but their range and accuracy of fire would be lowered.

The explosion of the powder merely parts the gun and the shot. The range of the shot depends upon the slighthness of recoil in the gun. And the accuracy depends on the weight and steadiness of the gun until the shot is well clear of the muzzle. Over half the metal in a common Winchester rifle could be safely removed, but the range and accuracy of the piece would be partly lost. For good artillery practice, guns must be heavy. The saving of weight is unimportant.

It is claimed that the rawhide gun kept cool in firing. It makes no difference about the outside of the gun keeping cool, for it is plain that the inner tube will become hotter than the inside of an ordinary gun. And it will not cool as an ordinary gun will. The reason for its getting hotter and not cooling is because it is surrounded by a non-conductor—the rawhide.

ANDREW VAN BIBBER.

Cincinnati, August 8, 1895.

Low Wages in Japan.

Consul-General N. W. McIvor, writing from Kanagawa, Japan, April 15, gives the following as the rates of wages prevalent at Yokohama in January of this year, the working day being ten hours. When it is remembered that Japan has a population nearly as large as that of France, and that within twenty-five years it has advanced from comparative obscurity as a semi-civilized nation to one which has to be reckoned with as an important factor in the world's commerce and manufactures, competing actively and with constantly increasing energy with the western nations in all that pertains to supplying the eastern markets, the significance of these figures cannot be ignored.

PER DAY.

Carpenters.....	\$0.26
Plasterers.....	26
Stonecutters.....	31
Sawyers.....	29
Roofers.....	26
Tilers.....	31
Matting makers.....	24
Screen makers.....	26
Joiners.....	29
Paperhangers.....	24
Tailors:	
For Japanese clothes.....	24
For foreign clothes.....	48
Dyers.....	24
Cotton beaters.....	17
Blacksmiths.....	36
Porcelain makers.....	24
Porcelain artists.....	38
Oil press men.....	24
Tobacco cutters.....	24
Printers.....	19
Ship carpenters.....	29
Lacquer workers.....	24
Compositors.....	29
Sake brewers.....	22
Silk spinners (female).....	17
Tea workers, picking and preparing.....	29
Tea firing:	
Male.....	10
Female.....	14
Common laborers.....	7
Confectioners.....	12
Sauce makers.....	19
PER MONTH.	
Farm laborers:	
Male.....	\$1.44
Female.....	1.20
Silkworm breeders:	
Male.....	1.92
Female.....	96
Weavers (female).....	96
Servants in foreign houses:	
Male.....	2.88
Female.....	7.20
Female.....	2.40
Female.....	4.80

Cure of Bites of Venomous Serpents.

MM. Phisalix and Bertrand erroneously ascribe to the author a view which he repudiates, i. e., that chloride of lime has a vaccinal action. Conclusive experiments with chloride of lime have been made successively upon human subjects, especially by Prof. Halford, at Melbourne. He is now sending immunizing serum in considerable quantities to India, the Antilles, and Australia. It is sufficient to inject into rabbits a dose of the serum equal to 1-10,000 of their weight to enable them to bear afterward, without danger, a dose of venom capable of killing check specimens in from three to four hours.—A. Calmette.

Japanese Leather Paper.

Some years ago, the Japanese government established an imperial press, which does all the printing work of the government, from the alphabets ordered by the Minister of Public Instruction, and the postage stamps and post cards, to the paper money, of which so much use is made in trade. One of the specialties of the establishment is the manufacture of leather papers, which has been brought to a great degree of perfection, and is so distinctly Japanese. The Japanese, taking as a pattern some of the finest European leathers, have succeeded in applying their own peculiar methods of manufacture, and fashion them according to the Japanese taste. Papeterie has published some details of this essentially artistic industry. The first step is the engraving of a block, consisting of a large, hard wooden cylinder, hung on to a frame, which is engraved with a knife or chisel, the worker following the model with such precision and exactitude that the least wrong stroke is considered sufficient to spoil the whole block. When the block is ready it is covered with moist paper, which is folded and pressed on to the mould, then taken off and hung across a bamboo to dry. When it is thoroughly dried, by exposure to the air, decoration is commenced.

The paper is now spongy, and almost as absorbent as blotting paper. It is now covered with several coatings of glue, which makes the surface smooth and non-absorbent. The paper is then figured, metallized, and varnished, and the figured design then stands out, as if gilt. The Japanese have the monopoly of the best lacquer varnish. It is this lacquer varnish which gives a golden appearance to the metal, and the exact color is at the discretion of the worker. The final operation consists in the arrangements of border patterns, by means of stencil plates. This is done by young girls, who cut out the stencils with marvelous cleverness and exactness, and wield the brush with great dexterity. The same girls touch up the border work, erasing all smudges and filling up blank spaces, etc. The rolls of paper are then hung up again, and when dry are ready for the market. They are sent first to Yokohama, and thence all over the world.

One other remarkable fact about the Japanese imperial press is, that it was the first experiment in Japan of industrial organization on a large scale, at least, so far as concerns the regulating of hours of labor. Since then labor has been organized and regulated in the same manner in the private factories of the country, to the mutual profit of the producers and the workmen employed.

The Cultivation of Chicory in Belgium.

The Belgian government considers chicory a perfectly legitimate drink, on an equality with coffee and chocolate, for the adulteration of coffee, chicory, and chocolate, and the sale of such adulterated articles, are prohibited by law. All varieties of chicory, according to Jussieu, are indigenous to the European continent. The United States consul at Ghent says that all these varieties may be traced back to the chicorée sauvage (Cichorium intybus) and the chicorée endive (Cichorium endivia). The former, commonly called small chicory, is especially cultivated for its leaves, which make an excellent salad. This wild chicory, so called, is a very common perennial plant in Belgium, and is frequently cultivated in gardens. It has a fusiform and tap root; its stalk grows three feet or more in height. It is abundant along the roads and in the pasture lands of Belgium; in the gardens it develops much more, the height of the stalk often exceeding six feet, and its leaves are larger. The plant is sown in the spring, sometimes in beds, but more often along the borders. It only requires watering, and ordinary tilling and weeding. The green leaves only are ordinarily employed in medicine and domestic economy. For this purpose it is necessary to cut them from time to time, thus inducing new and more tender leaves to shoot forth; the stalk, too, must be frequently cut in order to delay as much as possible the floescence. Wild chicory is also an excellent fodder plant. Its most valuable property is its ability to grow in the worst soils, even such as are barren, chalky, or clayey. Almost all cattle eagerly hunt for the plant, and cows, which at first dislike it, rapidly become accustomed to its taste. By reason of its bitterness it acts as a tonic, and animals who feed upon it are much less exposed to cutaneous diseases. Swine are especially fond of the roots.

Among the varieties of wild chicory just described, the most important is chicory with large roots, known as "coffee chicory." It is a perennial plant, whose root, by torrefaction, acquires a bitter flavor and an aroma which is not unlike that of sugar converted into caramels. This is the variety which is daily increasing in commercial and industrial importance. In Belgium it largely replaces coffee in the lower ranks of society. West Flanders, in the district around Courtrai and Roulers, is its principal home. The method of its cultivation greatly resembles that of the beet. The seeds, which are very small, are sown by a hand drill, three rows at a time, during the months of April and May, and they are sown at a distance of about 15 inches

apart. There are several varieties, or, rather, subdivisions, of this variety. The two chief ones are known as the "wide leaved chicory" (à larges feuilles) and the "eel-headed chicory" (friseses a têtes d'anguilles), of which the latter is considered the best. The seed is obtained by replanting in the month of March, the old stalks being dug out during the preceding autumn. In the course of a few weeks these go to seed. Each plant gives about 300 grains of seed. Another estimate gives 530 pounds of seed per acre. A temperate climate is required, and a vigorous soil, even slightly clayey, produces the best chicory with the heaviest roots. Sandy soils also are good, but the roots are generally lighter. The soil must be plowed several weeks in advance.

About 160,000 plants are raised per acre. A crop of 11 to 14 tons of green roots is produced per acre. The harvest takes place in October and November. The roots must be immediately washed and dried, and then may be preserved for 15 to 18 months. The seeds, if put in a dry place, may be kept for seven years. The plant has no known diseases, but is subject to the attacks of a worm which eats the roots. The leaves of the plant generally grow in a small tuft, are narrow, and do not exceed 10 or 12 inches in height. The roots are carrot shaped (slightly larger), dark gray in color on the exterior, and nearly dead white in the interior. The roots are dried on perforated racks in kilns by means of coke fires, and are then cut by machines into small pieces. These are known as cossettes, and chicory is generally exported to America in this form. Afterward it is ground and sold in powder under the name of granulated chicory. Only very recently a royal decree has been promulgated in Belgium declaring the essential qualities of pure chicory, requiring all packages to be legibly marked with the name, and forbidding under heavy penalties the sale of any adulteration as the genuine article. A similar law exists respecting coffee.

Rat-tailed Grubs.

The specimens received from Mr. D. L. Phillips, of Little Rock, Arkansas, and which he found in the bottom of an old bucket in which had been kept a decoction of tobacco stems, were very much damaged and scarcely recognizable by virtue of the fact that the vial had become uncorked and the liquid as well as the specimens all dried up in transit. It so happens, however, that even in this desiccated condition the long filamentous termination of the body indicated sufficiently the character of the creatures. They are what is known as rat-tailed maggots, the larvæ of two-winged flies belonging to the genus Eristalis. Flies of this genus have a general resemblance to some kinds of bees, not only in color, but in their humming flight. One of the commonest species (Eristalis tenax) has, in fact, often been confounded with the hive bee. Their larvæ are semi-aquatic, often being found in foul water, in decomposing wood, tan pits, privies, and other like foul and semi-liquid substances and situations. They are characterized by having long extensible caudal extremities or tails, by means of which they are enabled to breathe, these tails being, in fact, breathing tubes. The underside of the body is furnished with seven pairs of membranous projections or feet provided with small hooks, and by these two peculiarities they differ from all other larvæ of their order, as no other dipterous larvæ are known to have such well developed pseudopods. When full grown, these rat-tailed larvæ quit their aquatic or sub-aquatic surroundings, bury themselves in the ground or hide under other moist places. Here the body contracts and hardens, the tail-like respiratory organ dies away, and four small respiratory horns develop in the front part of the body near the head. The allied genera Helophilus and Xylota have somewhat similar rat-tailed larvæ. It is a peculiarity of many Dipterous larvæ that they are able to live in the foulest substances and in situations where most other insect larvæ would perish.—C. V. Riley.

Wind Velocities and Pressures.

Mr. E. F. Miller, in the Proceedings of the Engineers' Club of Philadelphia for April, gives a table of wind velocities observed by the United States Weather Bureau at Philadelphia. For calculating the pressure per square foot the equation used was:  $P = 0.004 V^2$ . The table is as follows:

Highest velocity in the month of	Occurred in the years of	Velocity recorded by anemometer M. P. H.	Corrected velocity M. P. H.	Corresponding pressure per sq. ft.
January.....	1878 & 1885	52	42.2	7.13 lb.
February.....	1876, '80, '86	48	39.3	6.18 "
March.....	1888	60	48	9.22 "
April.....	1879	50	40.8	6.67 "
May.....	1889	60	48	9.22 "
June.....	1889	46	37.8	5.72 "
July.....	1876	40	33.3	4.44 "
August.....	1893	55	44.4	7.89 "
September.....	1889	54	43.7	7.64 "
October.....	1876	75	58.7	13.74 "
November.....	1873	66	52.3	10.94 "
December.....	1876	63	50.2	10.08 "