FLAWS IN BIG GUNS.

INTERNAL DAMAGE CAUSED BY SUCCESSIVE DISCHARGES.

The "Erosive Action of Inflamed Gases" Causes the First Serious Injury—How the Projectile Helps to Kill the Gun.

The larger a cannon the more extensive are the injuries it receives with each successive discharge. All damage done to a gun is internal. The separate action of the powder and the projectile damages the piece every time it is aimed and fired. Obviously the amount of the damage depends upon the material and workmanship of the gun. Men who make big guns describe the harm done their pets with many intricate and puzzling terms of a scientific turn. In one case a gun is damaged because the part of the bore which contains the powder is enlarged. This happens when the metal is compressed, and it is more dangerous and more plainly seen if the gunners have been using wads between their explosive and their projectile.

Then, again, cavities are produced by the melting away of a part of the metal by the heat of combustion of the charge. Cracks come from the tearing asunder of the particles of the metal at the surface of the bore. When it is first made, a crack of this particular kind is barely perceptible, but it increases each time the gun is fired. Gradually it extends completely through the side of the piece. The crack usually begins at the junction of the chamber with the bore, simply because, as guns now are, this part is not so well supported as the others.

Edward S. Farrow, U. S. A., is authority on damage to guns, although, like all others who have studied the question, he does not agree with very many authorities on all the points to consider in the life of a cannon. He contends that furrowing or scoring produced by the erosive action of inflamed gases is the great disease which attacks the very big guns first. This particular injury is most apparent where the current of the gas is most rapid or at the interior orifice of the vent and on the surface of the bore, directly over the seat of the projectile. This scoring begins very early in the life of a very large gun, but it is conceded that it does not become very important until the piece has been discharged considerably. Lieutenant Farrow describes this scoring as resembling the bark of an aged elm tree, the metal being eaten away into irregular furrows and ridges. In extreme cases, however, scoring has not killed the gun, although in some cases it has acted like a wedge and split the bore at the place attacked.

Where the action of the projectile has ruined the gun the damage has been done around the projectile and in front of it. The elasticity of the metal and the crowding up of portions of it in front of the shot cause a rebounding process. The projectile, carried forward by the force of the charge, strikes against the upper part of the bore; then it is sent against the bottom and again bounds to the top, and so on until it emerges from the piece. The effect of this bounding motion is to raise and depress the gun in its trunnion holes. The accuracy of fire is diminished, and, of course, the gun is unfit for service. Bronze guns are the worst sufferers in this way. Mortars—short and dumpy—are not affected.

To stop the bounding of the projectile gunners wrap the shell in cloth or paper or else shift the base of the mass to be hurled. This last process is considered the best and is done by reducing the diameter of the cartridge and adding to its length. Projectile injury is also caused by furrows or scratches made by rough shells or case shot. Small fragments, too, break away very often from the shells and give the bore a grinding and cutting process, productive of great damage.

Enlargement of the muzzle is another serious injury produced by the projectile. This is caused by a process which seems unavoidable. As the shell leaves the piece it strikes against one portion of the bore. The resistance at the mouth being less than at any other point, the metal naturally yields, and the muzzle of the cannon is elongated in a vertical direction.

Some men who ought to know say that 150 shots is the life of a very big gun—a 12 or 13 inch weapon. Others place the number of shots at 400 or 500. As a matter of fact, it is all guesswork. The great Krupp gun shown at the World's fair and conceded to be perfect—or supposed to be so—has been discharged less than ten times, and it is now believed to have reached its limit. On the other hand, the big guns of the American battleships have passed the time allotted them by wise men who know guns and apparently are as good as when tested. How soon they may yield, however, is not in the books.

Lieutenant Farrow says that a very large gun should not be expected to stand more than 400 or 500 shots before it will be necessary to open a new vent, closing the old one at its interior orifice. When the gun dies—bursts—the lines of fracture are photographed. Specimens of the metal are saved. Tests are made and conclusions drawn. And Uncle Sam has figured out so many things in this same connection that his guns nowadays are conceded to be better than those of any other maker. They live longer than the wise ones say they should.—Chicago Times-Herald.

Everybody Warned.

An Arizona rancher has posted the following notice on a cottonwood tree near his place: "My wife Sarrah has left my ranch when I didn't Doo a Thing Too her and I want it distinkly understood that any Man as takes her in and Keers for her on my account will get himself Pumped so Full of Led that some tenderfoot will locate him for a mineral claim. A word to the wise is sufficient and orter work on fools."—Denver Times.

A Brazilian Indian Story.

Here is a Brazilian Indian story, says the New York Times. The jaguar and the monkey met. The jaguar had a luscious bunch of plantains which the monkey craved. "I will gladly give you the plantains," said the jaguar, "providing you catch a fawn for me." "Agreed," cried the monkey. "But," added the jaguar, "if you don't get the fawn you must promise to let me bite a mouthful out of you." "Agreed," once more cried the gleeful monkey. The monkey ate the plantains, and the little matter about the fawn quite slipped his memory.

Then one day the jaguar met the monkey and insisted on taking his pay out of the monkey's hide. The business, becoming serious, was left to the peccari to decide. "It seems all right enough," said the peccari, "only this: How am I to determine what is the exact size of a jaguar's mouthful and also where is he to bite? He had better refer the matter to the big snake." The big snake took the subject under consideration. His judgment was that he would have to swallow the jaguar, the monkey and the peccari. The jaguar and peccari he did at once assimilate, but the monkey, being nimble, escaped.

A Burglar's Mistake.

"When I looked into the dining room of a house that I was in one night," said the retired burglar, "I saw a man sitting in a chair perched upon the dining room table. That seemed a singular place for a man to get to sit, drunk or sober, but I thought I'd have to give him a chance to get tired of sitting there and go to bed before I began, for if I didn't he might wake up any minute and interrupt things. So I took a seat in a big leather chair in the library, next room, and waited for him to wake up. When I'd waited what I thought was a reasonable time without hearing from him, I looked in again, and there he was, still sitting there, just the same.

"But this time, even in that light, there was something peculiar about him, and I ventured to turn my own light on him now, and then I saw that it wasn't a man at all, but a suit of clothes, with a hat on top, set up there to dry after being wet in the rain. The man that had worn them had been abed and asleep for hours, but his clothes had served for a scarecrow mighty well, for I'd sat there waiting for them to go to bed so long that it was now too late for business."—New York Sun.

Clothespins.

Clothespins are an American commodity. Some clothespins are made in Sweden and in Scotland, but they are big and clumsy, twice the size of the American pins and whittled out by hand. Clothespins are made chiefly of beech and of maple, but some are made of tupelo wood. They are made entirely by machinery, counted into boxes containing 720 each by machinery, and the boxes are nailed up by machinery. It might almost be said that blocks of wood fed to machines at one end come out boxed clothespins at the other. They are made and sold wonderfully cheap.

There are two grades of clothespins, firsts and seconds. First grade pins can be bought for 35 cents a box. The production of clothespins is enormous, millions of boxes annually. The consumption in this country keeps pace with the growth of the population, and great numbers are exported. Even people in the trade wonder what becomes of all the clothespins.

What Bothered Him.

"When I was a young man," says a well known civil engineer, "I was surveying the route of a proposed railway. An old farmer with whom I stopped for a time admitted one day, when he saw me figuring in the field, that mathematics always seemed a wonderful thing to him. Being young and enthusiastic, I began to enlarge its wonders, telling him how we could measure the distances to different planets, and even weigh them; how we could ascertain the height of mountains without scaling them and many other things which I meant should astonish him.

"You can imagine how he set me back when he replied to this brilliant array of facts by saying: 'Yes, yes, them things does seem kinder cur'us, but what allus bothered me was to understand why you have to carry one fur ev'ry ten, but if you don't the durned thing won't come out right.'"—New York Tribune.

"Billington's Sea."

There is tangible evidence that the pious passengers of the Mayflower were not entirely without a sense of humor. Back of Plymouth over the hill upon which they planted their cannon is a large fresh water pond, perhaps a mile in diameter, which, it appears from the records, was discovered by John Billington while he was prowling around one night, probably on a scouting expedition looking for Indians. In the morning he reported that he had found the sea in that direction and there was a lively dispute between him and the other pilgrims as to the accuracy of his information. He stuck to his theory with the same tenacity that he adhered to his religion, and to this day that pond is called "Billington's sea."—Chicago Record.

Beyond Medical Skill.

Master—Late again, Sandy! Can't you manage to get here in time?

Sandy (with a doleful headache)—I canna sleep o' nichts, sor, and so I'm loath to get up in the mornin.

Master—Eh, man, sleeplessness! Why don't you consult a doctor and get at the cause?

Sandy—I get at the cause weel eneuch, but it'll no shut up. It's 6 weeks auld and an awful yeller.—Glasgow Times.

The polar currents contain less salt than those from the equator.

Afghan women are never jealous of each other.

Sydney Smith's Joke.

Sydney Smith was very happy in his country life, and his children caught his spirit of delight over common things. They loved animals and spent long hours in training them. One little beast, a baby donkey, became under their tuition perhaps the most accomplished of his species and unconsciously gave rise to a quatrain which now belongs to the fame of Sydney Smith. The donkey was a well educated chap. He would walk up stairs, follow the family in their rambles like a dog and when they entered his meadow run to meet them with ears down and tail erect, braying joyously.

One day, when Billy's head was crowned with flowers and he was being trained with a handkerchief for a bridle, Mr. Jeffrey unexpectedly arrived. He joined in the sport and to the children's infinite delight mounted Billy.

Thus he was proceeding in triumph when Sydney Smith and his wife, with three friends, returned from a walk and took in the festal scene. The great man advanced, with extended hands, and greeted his old friend in an impromptu which has become familiar to the reading world:

> Witty as Horatius Flaccus,
> As great a Jacobin as Gracchus.
> Short, though not as fat as Bacchus,
> Seated on a little jackass!
>
> —Youth's Companion.

The Death of Coaching.

The coaching system died a lingering, a lamentable death. I can remember something of a few coaches in remote districts which longest escaped strangulation, and memory of those distant days has been sweeter without them. They resemble what Nimrod describes as the obsolete, old fashioned coach of his boyhood, drawn by dispirited, ill fed jades over long stages. One of his paragraphs well describes what used to make my blood boil with impotent fury, imbittering the joy of returning home for the holidays, and deepening the depression of the schoolward journey:

"The four horse whip and the Nottingham whipcord were of no avail over the latter part of the ground, and something like a cat-o'-nine-tails was produced out of the boot, which was jocularly called 'the apprentice,' and a shrewd apprentice it was to the art of torturing, which was inflicted on the wheelers without stint or measure, but without which the coach might have been often left on the road."

No; the best of the road coaches—corruptio optimi—disappeared and left none to mourn them.—Blackwood's Magazine.

Bribing Spurgeon.

The autobiography of the late Rev. Charles H. Spurgeon contains an account of what may be termed an early business venture and its influence on his character.

Spurgeon was brought up on Watt's hymns, but not altogether willingly. His grandmother coaxed him with money to learn them. At first she gave him a penny, but when she saw how easily it was earned the old lady reduced the prize to a halfpenny and then to a farthing. There is no telling how low the amount per hymn might have fallen, but just at this time his grandfather made a discovery which seemed more desirable to Spurgeon.

He discovered that his house was overrun with rats and offered his grandson a shilling a dozen for all he could kill.

The occupation of rat killing gave him more money than learning hymns. "But," Mr. Spurgeon characteristically says, "I know which employment has been the more permanently profitable to me."

All Business.

"I'm afraid our new son-in-law isn't much of a business man," she said.

"Don't you worry about that," replied the old gentleman. "If he doesn't know how to make the best of a bargain, I don't know who does. The day before the wedding he discovered that Minnie had a freckle under her left ear, and he made me add $1,000 to her dowry on the ground that the goods weren't entirely in accordance with the invoice. I was almost tempted to believe that he wasn't a nobleman at all, but a New England Yankee in disguise."—Chicago Post.

Practical Classics.

Mrs. Timkins was taking her son to school for the first time, and, after impressing the schoolmaster with the necessity of his having a thoroughly good education, finished up by saying, "And be sure he learns Latin."

"But, my dear madam," said the schoolmaster, "Latin is a dead language."

"All right," said Mrs. Timkins. "He'll want it. He's going to be an undertaker."—London Tit-Bits.

An Awful Sentence.

A celebrated Irish judge once passed sentence in the following manner. The prisoner was a butler who had been convicted of stealing his master's wine: "Dead to every claim of natural affection, blind to your own real interests, you have burst through all the restraints of religion and morality and have for many years been feathering your own nest with your master's bottles."—London Telegraph.

A Monster Flower.

The largest flower in the world, it is said, is the bolo, which grows on the island of Mindanao, one of the Philippine group. It has five petals, measures nearly a yard in width, and a single flower has been known to weigh 22 pounds. It grows on the highest pinnacle of the land, or about 2,500 feet above the level of the sea.

No Escape.

"What is your name, Mr. Throgson?"

"My name is Adam, Miss Wellalong."

"And my first name is Eve! Dear me! What a—what a remarkable coincidence."—Chicago Tribune.

Lightning's Assaults.

One of the best evidences of the value of lightning rods up to date has been afforded by the Washington monument. It is capped by a small four sided pyramid of aluminium, which metal, so cheap today, was very costly at the time of the building of the greatest obelisk that the world has ever known. This aluminium tip is connected with the ground by four copper rods which go down deep into the earth. On April 5, 1885, five immense bolts of electricity were seen to flash between the monument and a thundercloud overhanging in the course of 20 minutes. In other words, the monument was struck fiercely five times, but it suffered no damage whatever.

On June 15 of the same year a more tremendous assault was made upon the monument from the heavens, and the result was a fracture of one of the topmost stones. The crack still remains to show what nature can do in the way of an electrical shock, but the slightness of the damage is evidence of man's power to protect himself from such attacks. The obelisk is ideally located for attracting electrical assaults from the skies, and yet, while many times hit, it has suffered only once and that time to a trifling extent.—Boston Transcript.

The Hour of Lincoln's Shooting.

A highly interesting story is told to account for the fact that almost every wooden clock in America has its hands painted to indicate the hour of 18 minutes past 8. It is related that most such watchmakers' signs were originally made by one man, who was at first in the habit of painting the hands to indicate any old or young hour that struck his fancy when he came to that part of the job. But when President Lincoln was assassinated he conceived the idea of commemorating the event by recording the hour and minute thereof upon all his wooden timepieces, a custom ever since perpetuated. There is something striking and dramatic about this notion of time standing still forever after an event of such tragic significance. There is no doubt about the fact that nearly all the wooden clocks do indicate the hour of 18 minutes past 8. You can see that for yourself. But if the clockmaker thought he was thereby recording the hour of the assassination his intelligence was as wooden as his wares, for President Lincoln was shot not at 18 minutes past 8, but at about 15 minutes past 10.—New York Post.

A Timely Event.

The bell at the parsonage went ting-a-ling, and, as the dominie was in his study and his wife getting the baby to sleep, Master Harold, aged 7, went to the door. On opening it he found a couple, evidently from the country, both young and bashful; but, after looking at the boy a moment, the young man queried, "Is the parson to home?"

"Yes," said Harold. "Do you want to get married?"

"That's just what we're here for," said the prospective bridegroom as he looked fondly at the blushing girl by his side.

"Well, come right in, then," said the boy, ushering them into the parlor, and when they had seated themselves on the edge of two chairs side by side he started off, saying: "I'll call pa, and ma too. She'll be awful glad, for she has all the marryin money, and I heard her tell pa this mornin that she wished some folks would come to get married, 'cause she hadn't 'nough money to buy her new hat.'"—Chicago News.

Musicians Live Long.

A French writer notes that, though a few great musicians have died young—to wit, Mozart at 35, Schubert at 31, Bellini at 33, Mendelssohn at 38 and Weber when he was but 40—a large number have lived to be very old men. Those who died between 60 and 70 years of age include Bach, Von Bulow and Rubinstein. Living beyond 70 years came Gluck, Gounod, Handel, Liszt, Meyerbeer, Rossini, Spontini and Wagner, while the great age of 89 was attained by Auber and others. Dying at more than 80 were Cherubini, Cramer, Lachner, Palestrina, Rameau, Schutz and Taubert. The average age of musical celebrities is about 67 years.

Good Reasons For Giving.

At the meeting of the Fifeshire association held in London Dr. Wallace told a story of a pensioner who used to stand with a placard on his breast enumerating his claims to the coppers he begged. The list ran thus: "Battles, 4; wounds, 5; children, 6; total, 15." This is almost as good as Sir M. Grant-Duff's story of the Irish beggar who prayed, "For the love of God, sir, give me a crust, for I am so thirsty that I don't know where I shall sleep tonight!"—London Globe.

The Bishop's Advice.

A clergyman once complained to Bishop Blomfield of London that his parishioners were indifferent to his teachings.

"No sooner," said he, "do I begin to preach than they begin to doze."

"Do you," asked the bishop, "preach your own sermons?"

"Always, my lord, always."

"Then, my good friend, suppose you try some one else's," retorted the bishop.

The Apparent Difference.

Johnny—Pa, some of the curious people round here they call "odd" and some of the others "eccentric." What's the difference?

Pa—When a man is said to be eccentric, he usually has more or less money. When he is poor, a man is simply odd.—Boston Transcript.

Twenty-three men in every 1,000 serving in the British army are 6 feet and upward in height; 33 in every 1,000 are 5 feet 11 inches, and 58 in every 1,000 5 feet 10 inches. There are 785 in every 1,000 army men under 5 feet 9 inches.

In only three cases out of ten the sight is equally good in each eye.

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