to Independence Day, it is notably the day of the Union soldiers who, dead and living, triumphed in the great fight against secession; and while through the growth of a beautiful sentiment May 30 has become an occasion of decorating the graves of all the dead, in the public exercises of schools or other organizations it is a mark of honor rather than occasion for reproof that the remnant of the nation's heroic defenders participate on that day.

The other cause of complaint is that fourteen members of the G. A. R. are given charge of military instruction in the public schools. There is no charge that they are incompetent instructors; on the contrary it is to be presumed that their active military service gives them practical knowledge of the art they are teaching. There can be no question of their patriotism, for in that service the offer made of sacrifice gives reply in advance. The fact that they upheld the Union flag is inspiration to their pupils to maintain their country's honor and integrity. And as there is military instruction in the public schools, there can be no better class of men for instructors than those who, possessing the necessary qualifications in other directions, have proven their fealty to the Union in honorable military service.

The people of this country do not anticipate trouble to the schools from the "clutches" of the G. A. R., and will look upon such assaults as the one referred to as unchristian, to say the least. The G. A. R. survivors, as a body, are regarded in the nation as typical of human loyalty to the Union. They are unlike a cabal of politicians or a coterie of sectarians who would engraft upon the school system that which would be perpetuated from generation to generation. Their days are numbered. But a few years more and the heroes of Antietam, Gettysburg, Shiloh, Vicksburg and Appomattox all will have passed from view. Still, while the honored ones among them are called to public action, the memory of that great era in their lives when they were marshalled under the starry flag for the overthrow of secession's fell design overshadows all else, and bears to later generations the lesson of zeal and patriotism for that Union of the people, "one and inseparable"—the great American Republic.

TALKS TO BOYS.

II.—TOBACCO, WHAT IS IT?

In the investigation as to whither the tobacco habit leads, we have reached a point where, for the prosecution of an intelligent research, we must get an answer to the question, What is tobacco? In brief, the definition of tobacco given in the encyclopedias that it is an herb of the natural order *solanaceæ*, having large, broad leaves; its botanical name is *Nicotiana*. The species are natives of warm countries, most of them American; they all possess the narcotic property, on account of which a few of them are extensively cultivated. This property resides in nearly all parts of the plant, although the leaves are almost exclusively used. The most important of the species is the common or Virginian tobacco—a plant which grows from five to six feet in hight.

By analysis, the chemist finds that the most active ingredient of tobacco is that from which the genus is named—nicotine; in addition there are found, in combination injurious to use for the human system, malic and citric acids, acetic, oxalic and pectic acids, and albuminoids; but nicotine is chief. In tobacco smoke the constituents also are many, the principal ones being carbonic acid, carbonic oxide, ammonia gases, carbon or soot, and nicotine. As to the proportion of the latter in marketable tobacco, it may be said that eight pounds of nicotine has been obtained from one hundred pounds of Virginian tobacco.

In connection with the inquiry as to what tobacco is, it may be well to say what it is in connection with the human body, or at least the process by which it is assimilated therein. When tobacco is used for chewing, the nicotine is absorbed by the lining membrane of the mouth and is carried into the blood. There it circulates through the body, and comes in direct contact with the heart, lungs, brain, and every other organ. When smoked in cigar, pipe, or cigarette, the nicotine is absorbed by the lining membrane of the mouth, nose, and lungs, and thus is carried into the blood.

Nicotine, which has been named as the chief alkaloid in tobacco, is one of the most violent of poisons. Extracted by chemical process, it is a colorless liquid. It produces death quicker than any poison except prussic acid. The amount contained in one strong cigar, if thrown into the blood, would cause death in a very brief space of time. A drop of nicotine placed upon a cat's tongue caused immediate insensibility, and death in two minutes. The peculiar flavor of nicotine is readily recognized as that which exudes from the habitual user of tobacco.

Carbonic acid, as the chemist's carbon dioxide is commonly called, and which is an important ingredient of tobacco smoke, will not support combustion. A lighted candle placed in it immediately goes out. It is deadly in its effect on the respiratory organs, although it may be taken without danger, and even with benefit, into the stomach, in aerated waters and in other ways. Air which contains nine to ten parts of it destroys human life by suffocation. Its general effect in smaller quantities in the air is to produce headache, loss of appetite, nervousness and mental dullness. It is heavier than air, hence collects in low places where the air is not disturbed, as in unused cellars, deep wells, and mines. It is the gas known in mines as "chokedamp," because it produces death by asphyxiation.

Carbonic oxide (carbon monoxide), which has been named as another of the main ingredients of tobacco smoke, is a colorless, odorless, poisonous gas, capable of displacing the oxygen in the blood. It does not support combustion, but is combustible, and is the gas which yields, when burning, the pale blue flame often seen playing over a freshly fed coal fire. Dr. E. M. Avery, the eminent writer on chemistry, says: "It is an active poison, and doubly dangerous on account of its lack of odor. One per cent of it in air is fatal to life, which it destroys, not merely by excluding oxygen (suffocation), as hydrogen, etc., do, but by direct action as a true poison. As this gas is formed in charcoal and anthracite fires, and as it secures an easy passage through faulty joints and even through cast iron plates heated to redness, it is the frequent cause of oppression, headache, and danger in stove or furnace-heated and ill-ventilated rooms." Carbonic oxide is the most dangerous of gases given off from coal fires. From this source, as from tobacco, when inhaled it combines with and enters the red corpuscles of the blood, thus destroying life by direct noxious action. In smaller quantities than to produce direct fatality it causes a tremulous movement of the muscles, and so of the heart. It has been used to a considerable extent for the purpose of suicide.

The gas ammonia is transparent and colorless, possesses an extraordinarily pungent odor which provokes tears, and has an acrid, alkaline taste. It is irrespirable, causing violent contraction of the muscles, as may be ascertained by applying the nose to a bottle of hartshorn, which gives off the gas. Great care must be taken to avoid inhaling the gas in any quantity, as it would produce the most serious results. An evidence of these may be seen in the violent blistering which follows an application of aqua ammonia to the skin. It is this ammonia gas in tobacco smoke which bites the tongue of the smoker, excites the salivary glands, and causes dryness of the mouth and throat.

The carbon or soot is that which gives color to the smoke, and is so disagreeable when it comes in large quantities, as from a furnace or other smoke-stack.

Here is a description of the nature and properties of the chief constituents of tobacco, both before and while burning. The seeds of the plant were first brought to Europe by Gonzalo Hernandez de Oviedo, who introduced it into Spain, where it was cultivated as an ornamental plant. Columbus learned that smoking tobacco was practised by the natives of the West Indies; the weed being in general use among the American Indians. Jean Nicot introduced it into France, and from him it derived its botanical name *Nicotiana*. Nicolo Menardes extolled its medicinal virtues, and his advocacy being taken up by others, it was quickly adapted to use in smoking, chewing, and snuff-taking.

On all grounds except as a medicine, tobacco met with great opposition. The popes Urban VIII and Innocent XI issued orders against it; the priests and sultans of Turkey declared smoking a crime, Sultan Amuret IV decreeing its punishment by death; the pipes of smokers were thrust through their noses in Turkey; in Russia, in the early part of the seventeenth century, the noses of smokers were cut off; King James I of England issued a document in which he described its use as "a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black, stinking fume thereof nearest resembling the horrible Stygian smoke of the pit that is bottomless." But all was in vain. Its alleged medicinal virtues, combined with its