lake coast, and at central distribution points along that line. It should also have a well drilled and organized naval militia, prepared to lay them out properly and put the life of death into them for those who attack us.

In these days, when the Monroe doctrine is expounded to embrace islands 2,000 miles and more from the continent; when interoceanic canals are to be controlled; and when it is the mode to twist the tails of the British and Spanish lions, to pull feathers from the Gallic cock and the eagles of Germany and Austria, it were well that many and rapid steps be taken to enable the country to maintain and prosecute a fight, if one should be developed. From the point of view of one to whom war means promotion, aggressive foreign policy might be very promising, other things being equal. Alas! other things are not equal; and while this country, in area, wealth, population, and latent defensive and offensive war strength, ranks among the highest of first class nations, yet in its immediately available defensive and offensive power, upon the sudden declaration of war, it ranks little, if any, higher than Denmark. Modern guns, forts, ships, torpedoes, mines, and gun cotton must be accumulated, and the fighting strength of the nation trained in their use.

Wet compressed gun cotton is the safest high explosive yet produced. It can be readily and safely transported by any conveyance whatever. It is eminently convenient and safe to handle, store, and work with. It can be sawed, turned, cut, and bored easily and with perfect safety; and the turnings, cuttings, and borings may be worked over, as may old, distorted, or obsolete shapes. It can be compressed in any shapes or sizes.

Dry compressed gun cotton is safer, in every way, than gun powder, and a very small percentage of the whole weight of any charge for explosive work need be dry.

In view of the daily accidents with the ordinary market high explosives, it is pertinent to ask what would happen if the work of lining our whole coast with mines and torpedoes charged therewith were attempted? Our defense would be as dangerous to ourselves as to our enemy. No man fights well who is afraid of his weapon.

The time has arrived for private enterprise to take hold of gun cotton. The processes and machinery for its manufacture can be greatly simplified and improved, and its sphere of usefulness much increased. It is certain that the overweening common sense of our naval and military ordnance authorities will, in the near future, cause it to be adopted as the normal high explosive for government use. Even now, reasonable inducement might be received for private parties to move in the matter.

As superintendent of the factory whose processes this paper describes, I have, in the past three years, made many tons of it, handling it under various circumstances, in both the wet and dry states, without injury to person or property.

That Ache in the Back.

An Albany physician, says a contemporary, declares that Americans suffer more generally from Bright's disease and nervous diseases than any other people, and he says the reason is that Americans sit down so persistently at their work. He says: "Americans are the greatest sitters I ever knew. While Englishmen, Germans, and Frenchmen walk and exercise, an American business man will go to his office, take his seat in his chair and sit there all day without giving any relief to the tension of the muscles of the back. The result is that these muscles surrounding the kidneys become soft and flabby. They lose their vitality. The kidneys themselves soon become weak and debilitated. If Americans would exercise more, if they would stand at their desks rather than sit, we would hear less of Bright's disease. I knew of a New York man who had suffered for some years from nervous prostration until it was recommended to him that he have a desk at which he could stand to do his work. Within a year he was one of the healthiest men you ever saw. His dyspepsia and kidney trouble had disappeared, and he had an appetite like a paver."

A Mountain of Iron.

Dr. Noetling, of the Geological Survey of India, in a recent report on magnetic rock among the Shan Hills of Upper Burmah, describes a mountain or hill at Singaung which "consists of a huge mass of iron ore." Having, he says, noticed on the way numerous pieces of iron ore, which became still more frequent on the southern side of the hill, he examined the latter in several directions. He found the surface everywhere covered with large blocks of iron ore, originating evidently from superficial decomposition of lower beds. He concluded that the whole hill consisted of a large mass of iron ore. He was unable to ascertain the geological conditions under which this ore occurs, or its exact limits and extensions, on account of the dense jungle and the tremendous attraction, rendering his compass useless. He estimates, however, that the hill covers, at least, an area of about a square mile, and that it rises about 200 feet above the level of the Twiunge valley. The ore is hematite peroxide of iron.

Correspondence.

Wheat in Geranium Stalk.

To the Editor of the Scientific American:

A peculiar growth has lately come to my notice, which may be of interest to some of your readers. About three weeks ago I was told, when about to plant some geranium cuttings, that if the lower end of a cutting was split and a grain of wheat inserted, it would much promote the growth, so I tried the experiment. It did not have the desired effect, as the cutting never grew at all; but when I pulled it up I found that the wheat grain had grown to the height of about 7 inches up through the pith of the cutting, and had two perfectly formed pale green leaves, closely folded up within. The only part of the wheat projecting from the geranium was about one inch of root. WM. H. P.

The Great Lakes.

To the Editor of the Scientific American:

I accidentally, a few weeks since, came in possession of the SCIENTIFIC AMERICAN of August 18, 1888, in which I read an article on the formation and changes of the level of the great lakes, by Mr. C. K. Gilbert. I was greatly interested in his theory and opinion of the changes of level of Lake Erie, of Lake Huron, of Lake Michigan, and Lake Superior. It is evident from the indications and marks on the south shore of Lake Erie that that body of water was, at some anterior date, many feet above the present level. Also, that Lake Huron's and Lake Michigan's present levels are many feet lower than they were at some anterior date.

In 1835 and 1836 I traveled on foot through the region of country from the southwest portion bordering on Lake Michigan in a southwest course to the Desplaines River, commencing some six miles south of Chicago, near or at the mouth of the Calumet River. The country at that time (1835) was a low, swampy region for some four or five miles in width, extending in a south by west direction toward the Desplaines River. Some ten or twelve miles from Lake Michigan, the low, swampy character of the land was contracted to about a mile in width, and from that point on to the Desplaines River was known as or called the sag. This sag was a wet, swampy piece of land, almost impassable, overgrown with long swamp grass and flags. This was the general character of the sag, or low ground, until it united with the Desplaines River, some six or eight miles above the town of Joliet. This low ground, commencing at Lake Michigan, and the sag, or valley, has every appearance of once being the bed of a large river. In June, 1835, I was at the town of Joliet, which had then but four or five buildings—but one house on the east side of the river (Desplaines) and three or four buildings on the west side of the river.

The valley of the Desplaines River, from the junction of this low, swampy sag, or valley, I should say is from one-half to three-quarters of a mile in width from thence to its union with the Kankakee River. From Joliet I traveled on foot down this valley, following an Indian trail most of the way to within a short distance of the town of Ottawa. The peculiar formation of the bottom, or land, of this valley, between the bluffs, was such that it led me to believe it was, at some ancient period of the world's history, washed by a large river. At Joliet, on the east side of the river, there was no soil of consequence. The valley was covered with round, coarse gravel and sand for from six to ten inches or more in depth; then the rock formation commenced; this extended down the valley for some two miles. This coarse gravel and small stones had every appearance of having been washed by water, they being so round and smooth. Some three or four miles below Joliet there is a mound, or mountain, as it was called at the time (1835) that I was looking at the country. This valley, on each side of the mound, had every appearance of having been washed by a large river. This mound is, I judge, some 60 or 80 feet in height, and the top of the mound is on a level with the country on either side of the valley. The top of this mound contains several acres of rich soil of the same character as the prairies in that vicinity. The upper end of this mound, at the base, is composed of a ledge of rock. There are also distributed throughout this valley, to its junction with the Fox River at the town of Ottawa, numerous small mounds, from 15 to 20 feet high. All of these had the appearance as if they were islands in the bed of a river. The formation of these mounds was precisely that of all islands in large rivers—broad and round at the upper end, and washed to a point at the lower end like this  . From the town of Ottawa to the town of Peru, the head of navigation on the Illinois River, the bluffs on either side of the river have the appearance of having been washed by the waters of a vast river. In fact, the Illinois River, with its tributary, the Desplaines, to its union with the Mississippi, I have no doubt, was the channel through which the waters of the great lakes, Erie, Huron, Superior, and Michigan, once found their way to the Gulf of Mexico.

There is no question, in the minds of scientific men, as to the fact that the surface of these lakes was many feet higher than at the present time. From the formation of the surface of the country at the southwest end of Lake Michigan, some ten or twelve feet elevation of this lake would discharge the water through the channel above mentioned into the Illinois River. There is no doubt but the ridge of rock formation extending from Lockport to and across the Niagara River was, at some anterior age of the world, a barrier to the outlet of Lake Erie; hence the evidence from indications on the south shore of the lake shows that the water of the lake was from forty to fifty feet higher than at the present time. There is, according to engineering surveys, but twenty-two feet fall from Lake Huron to Lake Erie; hence this elevated ridge of land crossing the Niagara River would be a barrier to the outlet of Lake Erie into Lake Ontario. Therefore the waters of Lake Erie flowed into Lake Huron and through the Straits of Mackinac into Lake Michigan and thence through the Illinois River to the Gulf of Mexico.

C. T. S.

Creolin in the Local Preventive and Curative Treatment of Infectious Throat Diseases.

BY F. W. KOEHLER, M.D., LOUISVILLE, KY.

In Nos. 17, 18, and 19 of the current volume of the *Wiener Medizin. Wochenschrift*, Dr. James Eisenberg describes a series of experiments made with the new antiseptic creolin. He shows it to be an extremely powerful germicide, and yet, even in large doses, altogether harmless to man. These qualities made it appear to me an ideal remedy for the preventive and curative treatment of infectious throat troubles. Adults can use gargles of the ordinary poisonous antiseptics, like the bichloride of mercury, but for children something is needed which can be safely swallowed. Soon after I had read Dr. Eisenberg's article I procured a supply of the creolin, and have since used it to the exclusion of other local applications. My success with it has been very pleasing indeed. In treating infectious throat troubles, I now always put not only the patient, but also all the well members of the household, on the creolin treatment. Thus I have prevented, I think, diphtheroid sore throat from going through entire families of children, which it had previously, under other modes of treatment, always done.

But it is as a preventive of true diphtheria that I expect most from the creolin. Dr. Eisenberg's experiments show that no form of pathogenic germ can resist its action; and it is therefore reasonable to suppose that the germ of this disease will also succumb to it. Recently I was called to see an old lady, who, a day or two after exposure to a case of diphtheria (proved to be so by paralysis occurring several weeks afterward), was taken sick with rigors, fever, and sore throat. Almost simultaneously her daughter and son-in-law were taken in the same way; but her little grandchild, a boy of four years, showed no signs of the disease when I was called. I at once, however, put him, as well as the others, on the creolin treatment. The child, although always rather predisposed to throat and bronchial trouble, escaped an attack altogether, and his parents and grandmother recovered promptly.

Diphtheria is certainly one of the most dreadful diseases that confront us, and any treatment that might reasonably be expected to prevent its spread should be given a trial. I am inclined to believe that if the mouths, throats, and nasal passages of children were kept as clean as their faces, there would be much less of the disease. When diphtheria prevails, no child's toilet should be considered complete until the upper air passages have been thoroughly douched with some suitable antiseptic; and in the long list of such agents I know of none that fulfills the requirements so well as creolin.—*Medical Record.*

Good Counsel.

How true it is, as the *Practical Mechanic* says, thousands start well, but never finish one thing at a time. They have a dozen things on hand and no one completed. Time is wasted on unfinished work. Always finish what you begin. One thing finished is worth a hundred half done. The completion of an undertaking yields more pleasure and profit than dozens of plans. The man who is always planning or scheming is rarely, if ever, successful. He often furnishes ideas for others, who go persistently to work and finish what his ideas suggested. "That was my idea—my plan," we frequently hear some one say, but the man who carried it out was the one who benefited himself and others. Do not begin what you cannot finish. What you undertake to do, *do*, and reap the reward of your own ideas and skill. This is good advice both in and out of the shop.

New Automatic Rifle.

A new automatic magazine rifle, invented by R. Dewhurst and H. A. Pitcher, has been brought out at Neillsville, Wisconsin, where it is making quite a sensation. Like the Maxim gun, the cartridges may be fired singly, by pulling the trigger for each desired discharge, or the gun may be set so as to fire itself off, with great rapidity, until all the cartridges in the magazine are used.