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IMPORTANCE OF RAGS.

The wealth that is brought into existence by manufactures, or reproduced from apparently valueless substances by the marvelous, transforming power of human ingenuity, impelled by human wants, is a subject of surprise, even to the thoughtful observer. Enormous quantities of refuse matter are transformed into healthful fruits, grains, vegetables, and flowers, by the liberation of their gases and the dissolution of their salts. Bones, discarded by the housewife as useless, are wrought into forms of use and beauty, but in no instance is the value of articles which have outlived one condition of usefulness, and been submitted to the re-creative power of manufacture, more apparent than in the change which rags undergo.

From time immemorial rags have been the symbol of poverty, worthlessness, and vileness, and, as such, are referred to in the Bible and in the earliest profane works. Their usefulness as a material for paper seems, however, to have been discovered several centuries ago. The oldest specimen of paper made from linen rags contains a treaty of peace between the kings of Aragon and Spain, bearing the date of 1178. Raw cotton was, however, used for paper making before this time. It is tolerably certain that mills for making paper from rags were operated in Spain as early as 1085 (*vide* "Chronology of Paper and Paper Making," by J. Munsell.)

Rags, particularly cotton and linen rags, have been for many years one of the housewife's perquisites, and many a shining treasure in the kitchen and many an elegant teapot on the table, has borne witness to the thrift of the good woman in her practice of economical saving. All these rag-savings find their way to the paper mill. Their price has more than quadrupled since the diminution in the supply of cotton caused by the war. But the supply of this country is wholly inadequate to the demands of the manufacturers and the public. Once writing paper was not very generally used—at least, the people generally required but a small portion compared to the quantity they now demand. It might have been supposed that the increasing facilities of travel would have diminished the necessities for writing; but the contrary seems to be the case. Personal contact and mutual acquaintance beget new commercial alliances, and correspondence is necessary. The rags made in this country constitute but a small portion of those used by American manufacturers. We imported for the quarter of the present year ending June 30th,

rags to the value of \$426,766. In the ten years ending with 1865, the amount of rags imported was 209,883,718 pounds. Italy furnishes a large proportion of the rags brought into the United States. Everybody has heard of the Italian lazzaroni, who wear the scantiest dress of the filthiest rags; yet from this unpromising source nearly three-fourths of our supply comes.

Italy is the country of the open palm, and begging and rags go together. Begging there, and in other parts of southern Europe, is as much a profession as any industrial pursuit in this country, and the uniform of rags is more important to its successful prosecution than is the Government livery to the soldier. Still, valuable as rags are to the professional beggar, and important as they may be to abject poverty, they are far more important to the world at large; for up to the present time no other material has been found to usurp their place as the basis for paper. Their scarcity and constantly enhancing value have stimulated ingenuity to provide a substitute, but it has not been so successful as could have been wished. Straw, wood, and other substances have been, and are now, extensively used in the manufacture of the coarser papers, but nothing equals linen and cotton for the production of the firmer and finer qualities. Some of the European Governments, for this reason, have prohibited their exportation.

It is a little singular that advances in knowledge and refinement—the triumphs of intellect and the spread of intelligence—are so closely dependent upon the contributions of ignorance and poverty. Possibly the sheet upon which we are now writing, and the page that will bear to our thousands of readers these printed lines, were once the filthy rags that but half concealed the nakedness of a Neapolitan beggar or an Egyptian fellah. It is to be hoped that the transformation they have undergone is typical of the improvement which education and the arts are yet to work upon the meanest of the race.

THE PRODUCTION OF TIMBER.

Bayard Taylor, in a recent letter from Kansas, says that hundreds of acres of prairie, which have been protected from fires by contiguous cultivated fields, are overgrown with hickory and oak trees from four to six feet high. Where land is tolerably well watered and undisturbed, especially if in vicinity of wooded country, it will give support to what is commonly called a spontaneous growth of timber. The character of the growth depends mainly upon the quality of the soil. The seed may have remained for years in the soil, possessing a latent vitality, which awaits only favorable conditions for its development. Poor soils seem first to favor the pine, and this in turn gives place to the more rapid-growing deciduous trees, until the chestnut and the oak find fitting support and conditions for their growth and development. But in a country like this, where the demand for timber for manufacturing and building purposes threatens to rob us of our forests, it may not be well to rely wholly upon the unaided forces of nature for a supply. The resolution introduced into Congress to offer incentives to the planting of our immense prairies with trees, we regard as a timely suggestion. The great drawback to the settlement of those vast fertile plains is the absence of wood and an unfailing supply of water. These secured, and our prairies will be selected in preference to localities less favorable to agricultural pursuits, but which furnish wood and water in profusion.

Wherever there are forests there will be water, and the last is an indispensable requisite to human habitation. A section of country unprovided with elevated points as gatherers of the moisture of the clouds, must have a clothing of forest to retain the rains, which, on a naked plain, alternate periods of extreme drought with seasons of superabundant moisture.

THE NEEDLE GUN.

So much has been said about the Prussian needle gun of late, in the foreign journals, and the success of the Prussians with it, that many suppose it to be a new invention. On the contrary, it is twenty years old. We do not desire to depreciate it on this ground, but judging it solely by its intrinsic merit, it

is not up to the standard of American breech loaders. All military men know that an essential point in a firearm is simplicity and certainty in fire. Neither of these qualities is found in the needle gun, for the mechanism is clumsy compared with recent inventions, and the ammunition is complicated, and costly to prepare. The principal idea in this weapon is in firing the charge from the front instead of behind, as in other weapons. To do this the percussion powder is put into a cavity in the base of a paper sabot, between the ball and the powder, the charge being exploded by a wire or needle thrust through the cartridge.

The experience gained in the war of the rebellion shows us that the "magazine arm," or that weapon where the charges are contained in the breech, is most deadly, when in the hands of skillful troops. Other breech loaders have their good qualities, but all who remember the part the Spencer rifle bore in the contest will concede the point we make.

Breech loaders have this disadvantage: troops must be trained long and thoroughly, or in the heat of battle the charges will be thrown away from heedless firing. The Prussian army have had experience with breech-loading guns for fifteen years, and in their recent battles did well. We published an engraving of this gun on page 124, Vol. 5, Old Series, SCIENTIFIC AMERICAN, to which we refer our readers. This was in 1850, nearly 17 years ago.

OUR COMMERCIAL MARINE.

The depredations inflicted on our commerce during the war were so serious as to create a fear that many years of peace would be required for its recovery. Indeed, when the devastations of war in our own borders were taken into account, the prospect was very disheartening. In 1856 seventy per cent of our foreign commerce was carried in American bottoms, while, in 1865, only about twenty per cent was under our flag. To be sure this enormous falling off was not occasioned by the destruction of American vessels, but was caused by the sale and transfer of our ships to foreign merchants, in order to obtain the protection of European flags which our own could not accord.

It is evident, however, that already we are rapidly assuming the position we occupied as a commercial nation before the war. Several causes combine to assist this recuperation. The abundance of material for ship building, our extended coast line, the fisheries with their thousands of hardy mariners, and the immense traffic of our seaports, sending away the surplus products of our vast interior, with which they are connected by navigable rivers and iron roads, and bringing in the manufactures of Europe, all direct a large portion of our enterprising energy into the channels of commerce.

The breaking out of a war in central and southern Europe, which threatens to involve every continental nation, and possibly England, will create additional demands upon our commerce. We must assist in feeding their immense armies and in supplying the places of the hundreds of thousands who are drawn from the pursuits of peace. Our shipyards, our wharves, our seaports, and the country at large, will feel the stimulus this state of affairs engenders. Too far removed from the scene of strife to be involved in its complications, our commercial connection with the nations of Europe will affect our industrial interests, in one respect at least, favorably.

Water Supply for Philadelphia.

The water works of Philadelphia have been for years a great curiosity to strangers, Fairmount has been one of the "lions" of Philadelphia. The reservoir, with its accompanying machinery for elevating and distributing the water of the Schuylkill, has been considered a monument of engineering skill and successful endeavor. It is found out, however, that the growing requirements of the city demand a new or at least an additional supply of water. Mr. Birkenbine, the Chief Engineer, proposes to obtain a supply of water from Perkiomen Creek, and form a lake or reservoir of supply, in Montgomery county, nearly 27 miles from the city, and to conduct the water through an aqueduct to some high point within or near the limits of the city, on which a distributing reservoir shall be constructed. This, it is thought, will give a head of 75 feet above