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ored Fires without Sulphur.

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SCIENCE AND COMMERCE AS PEACEMAKERS.

strife. It is not until men cease to regard religion as the perfecting firearms, science put an end to individual dueling. about it.

direct and tangible. To the commercial mind the leading aërial torpedo carrier. question touching any course of action is, Will it pay? And the experience of mankind is, on the whole, that, commercially considered, war does not pay. Particularly is this true when the commercial relations of the contestants are at ticle of matter to be either wasted or lost, is so manifest that all close. Besides, commerce makes for peace by multiply- it could scarcely have escaped the attention of man; and so, prejudices, and by increasing the mutual interdependence of him putting in practice the lesson she has taught him, and nations.

with England. We have had disputes in abundance, and, for an appeal to arms. But our commercial relations have there be regarded as absolute waste. The same causes have settled by arbitration or other peaceful means.

It is equally clear that the commercial interests of Engrules.

dividual heroism and brute force. It is a common remark ventions for enabling men to kill each other with ever in-

engines of destruction, so awful in their scope and so irrefrom sources that would make the wearers stand aghast sistible in their power, that the mere assembling of masses were they to learn the facts. From a late report on the to be attempted?—engines by means of which a city or an trade in hair, gathered in the stalls of barbers, sprang army, however protected by fortifications, may be destroyed | up in 1873, during which year 141 piculs (18,800 pounds) without possibility of escape?

of England the governments of Europe have for the past mands of a caprice of fashion. quarter century put forth their strongest efforts to bring the To chemistry modern perfumery is perhaps more in-

So much for invention in payal warfare. The torpedo what city could stand, what fleet or army could gather for sulphuric acid on starch, sawdust, woody fiber, etc., a sac-

offensive purposes? All the usual machinery of war would There are two and only two great interests which, in the be useless, and war as we understand it would be impossible. progress of mankind toward civilization, have proved them- As the sea torpedo has made an end of naval battles, so the selves to be overwhelmingly on the side of peace, namely, air torpedo would put a stop to battles on land. And just Commerce and Science. And to the development of these we as, through increasing civilization, men are learning more must look for the final suspension of warfare, if the reign and more to put their trust, not on personal prowess or of universal peace shall ever dawn upon earth. It is true elaborate armament, for the settlement of their personal that religion claims to be a peacemaker also-the great peace-disputes, but in courts of law, so nations must learn to submaker; but history shows it to be rather a stirrer up of mit their quarrels to international courts of arbitration. In first of human interests, not until they become compara- In like manner, by perfecting means of wholesale killing, tively indifferent toward it indeed, that they cease to fight science is likely to put an end to national dueling. The most efficient agent of the (unorganized) Universal Peace The influence of commerce as a preventive of war is more | Society of the future will be he who shall invent the best

THE UTILIZATION OF WASTE MATTERS.

The strict economy of Nature, which never allows a paring channels of friendly intercourse, by removing national when circumstances compel him, it is not surprising to see striving to put every scrap to the best account. In China, The peace promoting influence of commerce can be clearly owing to the crowded state of the population, this economiseen in the recent history of the relations of this country cal husbanding of material has, of necessity, long been in vogue; and to such an extent is it carried that what would according to non-commercial standards, plenty of occasions be considered strict economy in Europe or America, would been so intimate and extensive that we could not afford to been slowly operating to bring about a similar state of things go to war; consequently our difficulties have been honorably in Europe. Thousands of materials that were but a few years ago thrown away as utterly useless are now carefully saved and turned to some account either for purposes of luxland have been the chief restraining force in that country ury or necessity. Hosts of costly products of distant climes during the recent oriental trouble. Both the ruling class can now be procured at home, at an insignificant expense, and the rabble have been eager for war; but the prudent, from the most unpromising sources. For instance, Science practical, commercial element has carried the day for peace. has evoked the most delightful perfumes from the most of-And we may set it down as an axiom in social science that fensive refuse, and extracted dyes of the most gorgeous hues as the commercial intercourse and mutual dependence of from a most unlikely looking material—pitchy-black tar. nations increase, their disposition to go to war with each Accidental discoveries, no less than active researches, are other will decrease. With such nations the prosperity of continually transforming some article comparatively worththe people outweighs dynastic pride or imperial ambition. less into something else that stands high in commercial esti-The people say, "War will not pay: let us have none of mation, and supplementary factories are gradually springit;" and more and more in the world the will of the people ing up to utilize the by-products of others. So numerous are the discoveries that something useless may be converted As the great ally and mainspring of commerce, science into something useful, and so rapidly does one follow in the plays an important role as national peacemaker; but its wake of another that it is difficult to keep pace with them. chief influence comes through its service in making war Scarcely a scientific exchange reaches us that does not conmore and more terrible and destructive, on the one hand, tain the announcement of some such fact, and the details of and, on the other, in making it less and less a matter of in-the process by which the result may be reached. Here, for example, before us, in the current number of the Echo Inthat the history of military art is simply the record of in- dustriel, we have a description of the method by which the straw is extracted from manure heaps to be subsequently creasing ease and swiftness. And the latest inventions have utilized (after cleaning and drying) as a cheap bedding for been most marvelous in their capacity for killing. There horses and cattle, packing for glass, crockery, etc., but more is small chance for personal glory on the battlefield now; especially for making paper pulp, to which it is said to and every new invention only helps to reduce battles more be peculiarly adapted; since, saturated with urine and aland more to the level of the shambles. The question is, Will lowed to ferment, ammonia is evolved, which aids in sepnot this line of progress soon end in making war too horrible arating the fibers, and reduces the need of using stronger to be tolerated? It must be apparent before long that no and costlier alkalies to a minimum. After extracting the end attainable through fighting can be worth the sacrifices straw the remaining manure is sold for the usual purposes. necessary to gain it through or in spite of such destructive The simple machinery for doing all this is the invention of an American resident of Paris. Much of the false hair Besides, may it not be possible for inventors to contrive worn by the fair sex of Europe and America is derived of men for offensive purposes may be made too hazardous commerce of Swatow (China) we learn that a large export worth 2,904 taels (\$4,300), were shipped to Europe. In We have seen of late years how one branch of war- 1875 the exports of this refuse arose to 1,000 piculs, with fare has been practically suspended by the progress of in. a value of over \$25,000, certainly a remarkable industry vention. In their desire to compete with the naval power to be created at such a distant point to supply the de-

science of offensive and defensive naval construction to per- debted than any art that ministers to the luxury of life. It fection; and England's counter efforts to maintain the su- is commonly supposed that all floral essences are the product premacy of her fleet have called out the utmost energies of of distillation; nothing could be a greater mistake; nearly her inventors and builders. Yet the result seems to be to every perfume of the toilet bottle or sachet of the mouchoir make a great naval battle no longer a possibility. During case is the product of waste matters—some of them odorthe Franco-German war the second best navy in the world less, others most intensely nauseous and disgusting. "Many could do nothing. During the war just ended the splendid a fair maiden damps her brow with the "Extract of Millefleet of Turkey, officered by Englishmen, has been little fleurs," innocent of the knowledge that its essential ingrebetter than useless. And with all our joy at the termination dient is derived from the drainage of the cow-house! The of that conflict, we cannot repress a shadowy regret that no perfumed toilet soap is scented, and confectionery flavored opportunity was offered to remove the uncertainty as to with oil of bitter almonds artificially prepared by the action whether the English ships could have got out of the Sea of of nitric acid on the fetial oil of gas-tar. The pure "fruit Marmora if any one had chosen to stop them. It might be sirups" of some of the soda water venders are made from worth a small war to have the status of iron clads definitely factitious oils that chemists have learned how to produce. determined. As things stand their utility is wholly a matter | Singularly enough, too, the latter are usually derived from substances of disgusting odor. The oil of pine-apples is obtained from a product of the action of putrid cheese on has been the great peacemaker. And it is quite possible sugar, or by making a soap with butter and distilling it with that the torpedo system may ultimately perform the same alcohol and sulphuric acid. The peculiarly fetid substance war restraining office on land. Surely science and ingenuity called "fusel oil" serves as a base for several artificial flaare capable of creating an aerial torpedo boat as efficient as vors; thus, distilled with sulphuric acid and acetate of potthe water torpedoes are. And then, who will dare go to war? ash it gives oil of pears; with sulphuric acid and bichromate Let us imagine an aërial torpedo carrier that could be navi- of potash the product is oil of apples. And so, too, by gated by electricity from the ground or from another air ship other means known to the chemist, refuse corks are made to kept beyond the reach of destructive missiles; a deadly yield essence of mulberries, tallow to put forth essence of machine that could be made to hover over an attacking melons, and the wood of the willow tree to part with oil of army or a beleaguered town and rain upon it explosive shells wintergreen indistinguishable from the genuine article." of the most destructive sort. Against a fleet of such engines, The fact, well known to the schoolboy, that by the action of