

## SCIENCE AND PROGRESS.

## SOME NEW DISCOVERIES OF THIS PROGRESSIVE AGE.

**A Steamer for a Five Day's Transatlantic Passage—The Commercial Value of the Investigator—A New Method of Extracting Aluminum**

**A Steamer for a Five Days, Transatlantic Passage.**

There has been placed on view in the Royal Naval Exhibition a beautifully finished model of a vessel designed by Messrs. James and George Thomson Limited, Clydebank, Glasgow, guaranteed to steam at the rate of 23½ knots an hour, which will enable the vessel to cross the Atlantic within five days. In view of the divergence of opinion as to the details of such a fast vessel, Messrs. Thomson are naturally unwilling to give everyone the benefit of their great and successful experience in the designing and constructing of modern Atlantic steamers, so that the dimensions, &c., are not indicated. We understand, however, that the vessel is about 630ft., long by 70ft., beam. The lines are very fine forward, and there is a "sweetness" aft which even exceeds the beauty of the City of Paris. The floor is flat, with a scarcely perceptible rise from keel to bilge. Unlike the City of Paris the new vessel will have a straight stem, but she will have the same large area balanced rudder and twin screws. These are 22ft., or 23ft., in diameter, and they are well supported. There are four funnels, and about 200 ft. of the length of the ship is left for the boilers and bunkers. The engine are triple compound with four cylinders working four cranks. They will probably indicate 33,000 indicated horse power. Accommodation is provided for 700 first and 300 second class passengers and about 400 emigrants, and all the arrangements worked out in the plans are far ahead, as far as regards luxury and comfort, of anything yet produced. The plating of the ship is carried up to the promenade deck which runs from end to end, and a width of about 20ft. on each side is left for walking. In the City of Paris the plating only comes to the upper deck, the promenade being supported on stanchions. The promenade deck in the new vessel is sheltered by a deck above, where the lifeboats are carried, while the roofs of the deck structures provide a promenade presumably for second-class passengers. In addition to the bridge forward, there is one aft, both being something like 45ft. from water level. There are two sticks as masts, but they seem only for signals and to provide a crow's nest for the "look-out." On the promenade deck are 12 machine guns, and in other respects the vessel is made suitable for an armed cruiser.—Engineering.

**The Commercial Value of the Investigator.**

The German manufacturer does not employ a chemist who has only learned by rote the wisdom gained by others; he does not ask to be told that which he already knows; he seeks rather to push forward into new fields, to excel his competitors more by intelligence than by brute force; and to gain a growing supremacy in preference to a mere victory for the moment. This practical policy, the outgrowth of intellectual culture, has made Germany a dangerous rival to all other countries in those departments of industry which rest upon scientific foundations. Applied science can not exist until there is the science to apply; and, where the latter is most favored, the industrial development is sure to be most perfect. **This lesson is one which the United**

States must learn more thoroughly than heretofore, if it hopes to hold its own in the front rank of manufacturing nations. In a few of our universities the truth is already realized, but in too many American schools the so-called "practical" view prevails. Under the latter, teaching becomes routine; and the student, while learning elaborately that which is known, is not taught how to discover. He has little or no training in the art of solving unsolved problems; and that art is the mainspring of modern industrial growth. A teacher of science ought also to be an investigator, were it only for the inspiration that his example might give to the pupils in his charge. To impart knowledge is a good thing, but to reveal the source of knowledge is better; and in that revelation is found the educational value of research regarded as a part of the teacher's essential duty.—Popular Science Monthly.

**A New Method of Extracting Aluminum.**

Mr. H. Greenway, an American, is credited with having discovered a new method of extracting aluminum, which relies for its success on the fact that alumina as it exists naturally in clay is found in a high state of sublimation. The new process is carried out by contact with the air in two furnaces separately heated, one of which contains a retort in which the clay is distilled, and the other a peculiarly constructed and arranged reduction chamber composed of refractory fire-clay lined with magnesia. The shell or chamber is a long rectangular prism in shape, the rectangular planes which approach very nearly to each other, thereby permitting the charges consisting of carbon, to be quickly heated to a high temperature. The distilling retort is charged with a mixture of bituminous coal and ordinary clay mixed, and the furnace is heated to a degree sufficient to generate gas without fusing the clay. The reducing chamber is charged with a suitable form of carbon, and then by means of a blast on a coke furnace the heat is raised to a temperature of over 2000° Fahrenheit. After the watery vapor has passed away, the alumina vapor, together with the coal gas, is decomposed, and in passing through the heated chamber is reduced to the metallic state.

**Why Leaves Change Color.**

The most unobservant have been struck with the remarkable change which takes place in the color of leaves in autumn. The alteration is so obvious as to have created a general belief that it is due to the frost or cold. While this is indirectly true, it is not strictly correct, because the change would occur, and as a matter of fact frequently does occur, quiet independently of frost. The green matter in the tissue of a leaf is composed of two colors—red and blue. When the sap ceases to flow in the autumn, and the natural growth of the tree is suspended, oxidation of the tissues takes place. Under certain conditions the green of the leaf will turn red, and under others it assumes a brown or yellow tint, the difference in color being due to variation in the composition of the original constituents of the green tissue, as well as to the varying conditions of climate, exposure and soil. Foliage is always more brilliant with a cold climate than with a damp warm one. Trees of the same age, and of the same kind, having the same exposure, may sometimes be seen growing side by side, of distinctly different colors, the leaves of one being a brilliant red and those of the other a dull tawny or yellow. For this phenomenon no explanation has been given beyond the suggestion that the difference is due to the roots finding their way into different soils.

# TAKE YOUR CHOICE

## OF JESUITS OR AMERICANS.

The Grand Island Independent says the Obligation Printed Alongside the Jesuit's Oath Below, is Used by the A. P. A.—It is Not—You Can Decide What Class You Would Rather Have Govern This Country.

**JESUIT'S OATH.**

I, —, now in the presence of Almighty God, the blessed virgin Mary, the blessed Michael the archangel, the blessed St. John the Baptist, the holy apostles St. Peter and St. Paul and the saints and sacred host of heaven, and to you my ghostly father, I do declare from my heart, without mental reservation that the pope is Christ's vicar-general and is the true and only head of the universal church throughout the earth, and by virtue of the keys of binding and loosing given to his holiness by Jesus Christ he hath power to depose heretical kings, princes, states, commonwealths, governments, all being illegal without his sacred confirmation, and they may safely be destroyed. Therefore, to the utmost of my power, I will defend this doctrine and his holiness' rights and customs against all usurpers of the heretical or Protestant authority, especially against the now pretended authority and church in England and all adherents, in regard that they be usurped and heretical, opposing the sacred mother church of Rome.

I do renounce and disown any allegiance as due to any heretical king, prince or state, named Protestant, or obedience to any of their inferior magistrates or officers.

I do further declare the doctrine of the church of England, of the Calvinists, Huguenots and other Protestants, to be damnable, and those to be damned who will not forsake the same. I do further declare that I will help, assist and advise all or any of his holiness' agents, in any place wherever I shall be and to do my utmost to extirpate the heretical Protestant doctrine, and to destroy all their pretended power, regal or otherwise. I do further promise and declare, that notwithstanding I am dispensed with to assume any religion heretical for the propagation of the mother church's interest to keep secret and private all her agents counsels as they entrust me, and not to divulge, directly or indirectly, by word, writing or circumstance whatsoever, but to execute all which shall be proposed, given in charge or discovered unto me, by you my ghostly father.

All which I, —, do swear by the blessed trinity, and blessed sacrament which I am about to receive, to perform, on my part to keep inviolably; and do call on all the heavenly and glorious host of heaven to witness my real intentions to keep my oath. In testimony whereof, I take this most holy and blessed sacrament of the eucharist, and witness the same further with my hand and seal, in the face of this holy convent.

Now, what do you think of that? Is that not a nice thing for an American (?) citizen to wear around in this country? Swears to support the holy church (the pope) without a mental reservation, no difference in what country he may be. Swears to help destroy all heretic (Protestant) governments. Swears that he will not obey Protestant officers or magistrates. Swears that all governments are illegal unless confirmed by the church. Swears to aid in breaking down Protestantism. Swears to be solely and wholly a Roman—the obedient servant, to willing tool of the man in Rome.

**A. P. A. OBLIGATION.**

Grand Island Independent: The following is the obligation taken by persons joining the A. P. A. as shown by the working book as explained by cipher explanation of blank spaces found in said book:

**WORKING BOOK OBLIGATION.**

Deputy—You will repeat after me the following obligation, giving your name in full. (Persons affirming will raise the right hand.)

I, —, in the presence of Almighty God, and these witnesses, do solemnly promise, declare and swear, that I will support and defend the constitution of the United States, and the state where I reside; I will keep inviolate the secrets of this organization; I will obey its constitution and laws; I will use my best endeavors to promote civil and religious liberty; I will not knowingly vote for, recommend for, nor appoint, nor assist in electing, or appointing a Roman Catholic nor any person sympathizing with Roman Catholicism, to any political position whatever, and in all my public and political action will be governed by the principles of this order; I will oppose all attempts to use the public funds for any sectarian purpose whatever and will ever maintain the great principle of one general unsectarian free school organization; I will never reveal any of the signs, grips, words, passwords or other mysteries of this order, or the names of any of its members, or its numerical strength, to the uninitiated; I will hold these principles above my party affiliation; I will always give a brother of this order preference in all matters of business and also in my act of elective franchise, all things being equal. I will make prompt reports to the chief recording secretary of every initiation made by me. I will advocate the principles of this order. I will use my best endeavors to initiate all true men, and in this way help spread the order; all this I voluntarily promise, declare and swear (or affirm) without hesitation or mental reservation, or any self evasion of mind in me, whatever, so help me God." (Recently incorporated as the American League.)

How many of you who have taken the A. P. A. obligation would recognize the above as that used by the order? What outsider, after reading the Jesuit's oath in the preceding column, believes even that obligation wrong? Is it not the height of impudence for rascals, for traitors, to try to call a halt in the American movement? That oath shows what the Jesuits are here for. It shows they wear the livery of heaven to serve the devil in. While they fawn upon short-sighted Protestants they have their minions working to destroy the government which furnished them a haven when driven from nearly every nation upon the earth. For our part we would not hesitate to choose between the two oaths. We are purely and simply an American, who believes it the duty of every man who comes to live in this country and swears allegiance to the United States, to so swear allegiance as not to have a mental reservation in favor of the pope. We believe in the above obligation, and care little who knows it.