

to form ring-shaped handles, etc. To this end, several small branches are allowed to grow, and these are fastened together. In time these become grafted to the principal stem and form handles of the desired shape."

A POWER-HOUSE ON WHEELS

ALMOST ever since the invention of practical electric motors, propositions have been made from time to time to install a miniature power-plant on an electric locomotive and run the locomotive with the electric current, thus making its operation independent of electric feeders and conductors. It has been continually pointed out by critics that to transform energy from the mechanical to the electric form and then back again to the mechanical involves a waste, and that unless it is possible to apply the power more economically to the wheels in the electric form, these successive transformations serve no useful purpose. It has been argued on the other side that this economy actually exists, and what has been named an "electric-turbo locomotive," using this principle, has just been built in Scotland, and has had preliminary trials on the Caledonian and North British railways. It remains to be seen whether it will live simply as a freak, like its predecessors, or establish a claim to usefulness. We quote the following description from *Railway and Locomotive Engineering* (New York, October):

"This long, strange-looking locomotive, with smoke-stack in the rear, cooler pipes in front, and the locomotive engineer and fireman in between, has just made its appearance in Glasgow, and has attracted wide-spread attention in railway circles. The steam is produced in its boiler, but instead of turning the driving wheels, it works a turbine which drives a dynamo, thus generating electricity for actuating the motors. The nominal power of the engine is equal to about 1,000 horse-power. The locomotive not being dependent on live rail nor wires can travel over any railway. It has been called the electric-turbo locomotive.

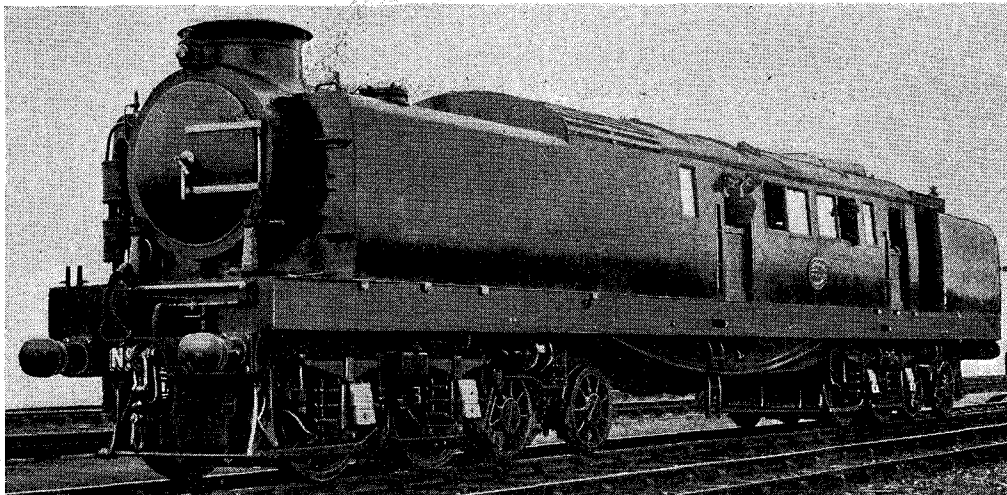
"Not long ago Mr. Hugh Reid, in his presidential address to the Glasgow Engineering Society, thus describes the steam-turbine electric machine, which is otherwise spoken of as the Reid-Ramsay locomotive. Steam is generated in a boiler of the ordinary locomotive type, which is fitted with a superheater, coal and water being carried in side bunkers and tanks. Steam from the boiler is led to a turbine of the impulse type, running at a speed of 3,000 revolutions per minute, to which is directly coupled a continuous-current variable voltage dynamo. This dynamo supplies current and pressures varying from 200 to 600 volts to four series-wound traction motors, the armatures of which are on the four main or driving axles of the locomotive. The exhaust steam from the turbine is condensed and eventually flows into the hot well carried on the engine.

"As the steam-turbine requires no internal lubrication, the water of condensation is free from oil, and can be drawn from the hot well and forced into the boiler as required. The water evaporated by the boiler is therefore returned again to the boiler, and is practically simply the vehicle used in the cycle of change where the energy in the coal is made to do the work of turning the wheels and so moving the engine and train.

"The condensation of the exhaust steam deprives the locomotive of the blast which stimulates the fire in ordinary locomotives. The forced draft is in this case provided by the use of a small turbine-driven fan. This fan is placed within the cooler which produces a circulation of air in the electric generators. The fan, therefore, draws cold air into the cooler and delivers warm air to the fire.

"The whole locomotive is mounted on a strong underframe and is carried on two 8-wheeled compound trucks, so built as to curve easily. The machine is intended for express passenger main-line work, and is really a traveling electric power-house on wheels.

"In concluding this description of the novel locomotive, we may quote Mr. Reid where he says, 'Most of the component parts of this steam-turbine electric locomotive have already proved themselves effective and efficient in other applications, and the novelty lies in the combination of the different elements of which the locomotive is composed. It is only when the attempt is made to substitute an electric for a steam-locomotive that we realize at what a very moderate first cost the steam-locomotive can now be produced in up-to-date establish-



By courtesy of "Railway and Locomotive Engineering," New York.

THE "ELECTRIC-TURBO" ENGINE OR ELECTRIC POWER-HOUSE ON WHEELS.

The rear end, with smoke-stack, is toward the reader's left.

ments with modern machinery and scientific organization in comparison with any arrangement involving the use of expensive electrical apparatus."

TO SHAVE OR NOT TO SHAVE—That is the question, according to *American Medicine* (New York), which calls it "the newest hygienic puzzle." Medical writers have held that the beard is likely to shelter bacteria, and some say the bearded man is more subject to colds for this reason, but the editor of *American Medicine* declares that "before advising men to shave, we would like to be convinced that it really has a beneficial result." Further:

"We would like to suggest that some one find out why beards were evolved at all if not for some beneficial purpose which women did not need. It is often said that sexual selection accounted for the matter, a beard in some way being more attractive to primitive women, and the possessors of bunches of hair had increased chances of securing mates, and that the beard may have had no other use or may even have been as burdensome as the enormous feathers of birds of paradise. Nevertheless mating generally takes place before the beard makes its appearance, and we must look elsewhere for the physiological reasons for its evolution.

"The purpose of the beard has some relation to a benefit in fighting and hunting which were about the only things man did at the time his face became differentiated from woman's. Whatever the benefit, woman in her more protected environment did not need it or was even harmed by a beard, and it is safe to say that modern men who do not hunt or fight and who are housed something like women, are as well off without beards or even better off. This much seems to be safe reasoning until we can find why Nature surrounded our mouths with bunches of hair to become smeared with everything we eat. For outdoor workers we would like to reserve judgment until the physiologists tell us why beards were evolved. This should not be a severe task, for the cause must have been potent to have made such a vast difference between the sexes. It is generally assumed that beards are still protective in some way and we would not like to accuse Nature of foolishness until we have the proofs, for we have never yet found her a fool."



PORTUGAL'S ATTACK ON THE CHURCH

THE WHOLESALE expulsion of monks and nuns from Portugal and the sacking of religious houses by the mob show that there is a religious side to the revolution. The Republicans are in control of the wires and the news is of a fragmentary character, so that our papers are commenting on this phase of the overturn with considerable reserve, but we are told that the revolutionists make a distinction between the religious orders and the secular priests. The priests are unmolested. In the Barcelona riots, where this same line was drawn, the press attributed the mob's hatred to the fact that the orders carried on various industries, exempt from tax, so that the dislike arose from economic rather than religious motives, and in Portugal Church and Crown were so closely allied that the one could hardly be hit and the other missed. What the real religious feeling of the people is, when economics and politics are eliminated, therefore, has not been clearly told. One of the first acts of the revolutionary government was the imprisonment of Cardinal Joseph Sebastian Netto, Patriarch of Lisbon, who shared the sentence of expulsion with the monks and nuns. A better feeling supervened, however, and he was released, Dr. Costa, the Minister of Justice, explaining, according to reports, that "the real object of the arrest was to protect the Cardinal from possible outrage." The Jesuit order especially suffers from popular odium because of its participation in the firing during the heated time of the revolt. One side declares the Jesuits fired first, the other says they fired in self-defense. The situation described by a dispatch to the *New York Sun* is this:

"Popular feeling against the Church is very strong in Lisbon. The Government opposes excesses and says it will prevent them, but Quelhaes has been the scene of shameful vandalism by a mob. The accounts of the origin of the trouble there, cabled yesterday, are conflicting.

"The throwing of bombs by Jesuits is as vehemently denied on one side as it is asserted on the other. Sympathizers with the Jesuits say the mob attacked the Jesuits without the least provocation, but they admit that the Jesuits fired rifles in self-defense. Whoever was initially to blame, the seizure of the convent by the mob was followed by disgraceful barbarism, which was not checked by the authorities.

"There is no doubt that the mob's object was plunder, and in the search for treasure the rioters smashed, tore, and generally destroyed almost everything of value within the building.

"Sacred images, altar-vessels, priceless volumes, illuminated missals, gorgeous vestments were smashed or torn and trampled upon with senseless fury, while everything that was regarded as worth stealing was looted. Disgusting acts of ribaldry and defilement were also committed by the mob.

"It was a brutal expression of the popular hatred of the priesthood, especially the Jesuits, which was the animating cause of the revolution far more than hostility to the monarchy. A similar orgy was enacted at the Trinas Convent. Apart from these scenes, however, the self-control of the people has been exemplary and the city is entirely orderly."

In a dispatch from Rome to the *New York Tribune* the Vatican is reported as discrediting the culpability of the Jesuit order. This is how the Vatican puts it:

"With reference to the Jesuits and other ecclesiastics throwing bombs and other explosives without provocation, the Vatican appeals to the common sense of the people of any country as to the improbability of such occurrences. The Vatican points out that it very likely was a repetition of what happened in Barcelona in 1909, that the mob must have attacked the religious houses, the inmates defending themselves."

The *New York Evening Post* draws a parallel between the state of things seen in Portugal and that existing across the border in Spain:

"That is to say, a people unquestionably Catholic in their preferences, and seemingly among the most obedient sons of the Church, had conceived a violent antagonism to the political activities and pretensions of the Clerical party. And hostility has been directed with special intensity against the religious orders. Hence it is not surprising that they have had to suffer in the downfall of a Catholic dynasty, yet it is pathetic to find that men and women vowed to a religious life and dedicated to works of charity and beneficence should have so completely failed to endear themselves to the people. Into the reasons we can not now go, but the result is certainly tragic.

"Dispatches from Rome represent the Pope as greatly distressed over the revolution in Portugal. It is not that the Holy See stands for monarchy, or for one form of government as opposed to another, but that the outbursts of the Portuguese people against the Church, with the haste of the new régime to proceed in a pronouncedly anticlerical spirit, are causes of great disquiet at the Vatican.

"That a cardinal and a bishop should have been compelled to leave Portugal, as well as the members of the religious orders, must cause Pope Pius both grief and alarm. Whereto will this thing grow? May not the anticlerical movement press on to new attacks in Spain and even in Italy?"

The *New York Sun* calls this attack upon the religious orders "stupid violence" and observes that "while the regulation of the religious orders and the separation of Church and State may be a pressing need for a reformed Portugal, the methods of pillaging churches and monasteries, by expelling high dignitaries and of employing violence on priests and nuns, will hardly commend themselves to foreign lookers-on, nor, we fancy, to enlightened Portuguese." It adds:

"The provisional Government should see that the new Republic is secure by obtaining the adhesion of the country, the Army, and the Navy before using force on any class of opponents. If it allows the mob to have its will in the streets of Lisbon it invites the immediate intervention of foreign Powers, and should know that a couple of modern cruisers will be enough to blow up the whole Portuguese Navy and to restore order in Lisbon.

"The danger of such a course must be plain to Señor Braga and the other professors who have seized the reins of government. The disorder is doubtless against their wishes; it indicates that they do not control the police and the Army and that the Lisbon rabble is becoming aware of their powerlessness. It is not by brave proclamations alone that a republic is established. The men who assumed power must show that they can use it. If street rioting is unchecked in Lisbon it will be impossible to avoid injuring the property of foreigners, and Portugal is too weak and too near to hope to have the impunity of Venezuela in flaunting the nations of Europe. Unless the Republic 'makes good' very soon, it will be wiped out as quickly as the monarchy was and practical Portuguese will be called on to decide what they mean to do with their country."



CARDINAL NETTO,

The Patriarch of Lisbon, who, with the religious orders of Portugal, was ordered expelled by the Provisional Government.