Curbing the Wireless Meddler

Regulation of Radiotelegraphy

By Robert A. Morton, Jr.

WHEREAS the Morse telegraph connects two or more definite spots, the wireless station, on the contrary, throws off in all directions wave-messages that can be received at any and all stations within a circle, the diameter of which varies with the power of the apparatus. The results are loss of secrecy, for any person may "tap" the ether and relieve it of messages, official or commercial, public or private; also interference, accidental or intentional, for only one station can operate its highest efficiency at one time in any one vicinity. It appeared inevitable, despite prospects of future improvements, that the construction of thousands of wireless stations of the navies, of commercial companies, of experimenters, and of amateurs, would shortly produce an "ethereal" chaos unless science should overcome the difficulties, or unless the indiscriminate building of stations should be prohibited, and the operation of all systems regulated by law.

Why the Government Wants Regulation.

Some degree of government regulation appealed especially to naval authorities. It increased immensely the possibilities in naval strategy of cruising, scouting, and fighting, and also in the handling of the fleets in time of peace. Within a few years practically every vessel of our navy, including colliers, tugs, and the boats of the Revenue Cutter Service, had been equipped with wireless apparatus, and to communicate with these the Navy Department erected a chain of coastal stations, reaching from Maine to Alaska. These stations not only controlled the vessels of the navy, but performed important maritime services—the sending of official weather reports, storm warnings, news of derelicts, and other hydrographic information of value to our shipping. A very important part of their work became the control of the revenue cutters while on duty at sea. Reports of wrecks or distress signals were forwarded to these coastwise patrols, and the resulting saving of life and property has been one of the most creditable accomplishments of our naval wireless system. The revenue cutter "Gresham" has a record of over three score lives saved, and more than forty vessels towed from dangerous positions when out of control. One day in the winter of 1910 the "Gresham" saved twenty lives from five sinking schooners along the New England coast, a feat which would have been impossible without her wireless equipment. The naval system in these and in other ways served both naval and public interests. When, therefore, a host of rival commercial companies, more than one of doubtful parentage and mission, planted their stations at convenient stock-selling locations, often within a stone's throw of naval stations, and proceeded to congest the atmosphere with much miscellaneous and irrelevant conversation, government regulation became a popular theme in official circles. At this moment, when the press is full of "wireless finance" disclosures, and when some half dozen promoters who controlled practically all important American wireless interests are residing at Atlanta at the expense of the government, a discussion of the exploitation of the commercial field is unnecessary. With all the gross mismanagement, however, these concerns performed real service in numerous cases of emergency at sea. The spectacular rescues of one corporation, for example, have almost overshadowed the fact, more patent perhaps to the stockholders, that the company, capitalized at twenty million dollars, has, since the government investigation, discovered a somewhat doubtful list of assets that total five hundred thousand.

The Interference of 200,000 Amateurs.

One result of the government's *laissez-faire* policy is the amateur wireless operator, an individual that made his appearance when the first naval stations were built. At the present date he is said to number approximately 200,000. For the most part he is a school boy eager to explore the latest scientific mystery, to make his instruments or buy them from a dozen firms that make it their business to supply him, to memorize the wireless codes, from a local wireless club and system, and, last but not least, to outdo the regular stations in long distance work; all of which would be satisfactory were it not for two facts; the constitution of the ether, and the importance of the naval and commercial systems in safeguarding life and property on the sea. Unfortunately the amateur thrives along the coast and near the regular stations,

and here he holds a strategic position, for he can prevent at will the operation of any other station in his neighborhood or within a distance of perhaps fifty miles. In some instances his interference has been malicious, as naval records show; in most cases it has been merely incidental to his wireless intercourse with his friends. Nevertheless, he has interfered with distress signals, and official dispatches, and has sent at least one fake dispatch—that in 1910 when a revenue cutter went to sea in a storm to look for a shipwreck that had its origin at an amateur wireless station.

Experimental stations conducted by responsible persons naturally fall in a different class from the amateur. Such stations are necessary and can be conducted without increasing interference difficulties. A private school at Newport, R. I., for example, has a powerful experimental station in charge of a government licensed operator, the first station of its kind to be so managed. The vital seriousness of the presence of the amateur lies partly in the fact that, however the naval and commercial interests may improve operating methods, the amateur operator having no co-operative responsibility, cannot be included in the improved system. He must always be a disturbing element however innocent his intentions.

A still further stimulus to the desire for government regulation outside of purely domestic arguments arrived with the events of the Russo-Japanese war. Briefly the proposition may be stated thus: radiotelegraphy is of incalculable importance in time of war, both for belligerents and neutrals. Therefore, each government must for its self-defense control all public and private establishments within its territory.

The Need of Regulation.

To-day it is clearly evident that however the past may have benefited by a *laissez-faire* policy, to-day some kind of responsible regulation is essential, and this not primarily for official interest in warfare, but as well for common sense domestic reasons. It is true that scientific advance has brought certain improved methods of operation. On the other hand, these advantages have been more than offset by additional interference, due to the rapid increase in the number of stations, and to the increased power and range of the instruments. The use of wireless by the army, the recent successful adaptations to aeroplanes, balloons, and submarines, indicate conclusively that the new telegraph will direct the next international struggle—that the "Message to Garcia" of the future will go by wireless.

Now, the policy of the government toward radiotelegraphy is limited to one of three alternatives:

1. Natural competitive growth without federal interference.
2. Government ownership and monopoly.
3. Government regulation and supervision.

The first proposition has the support of the commercial interests that must be affected by technical legislation requiring changes in wireless equipment, for a satisfactory system cannot be devised without very general changes in locations of stations and forms of apparatus at considerable expense. For reasons, however, already discussed, certain technical reforms must be instituted. The second proposition, in the opinion of the writer, offers the only satisfactory and permanent solution of the whole question of radiotelegraphy, for it should now be obvious that this activity has all the ear marks of a natural monopoly, and a natural government monopoly, and must finally become such. At the present time government ownership of public utilities is not a popular subject. The present method of attack therefore lies in the last alternative—government regulation and supervision.

In a bill "To Regulate Radio-Communication" now before the Senate, the matter of general legislation is met fairly satisfactorily. It provides that all American stations, private and commercial, be licensed and placed in charge of licensed operators; penalties are prescribed for interference with distress signals, or with naval or military dispatches, and for the sending of fraudulent messages. Failure to comply with these requirements would mean forfeiture of apparatus, and in some instances fines and imprisonment. The needs of general supervision are fairly well met, but the arbitrary and official tone and wording of the act is highly objectionable. Furthermore, the act destroys its usefulness by announcing a set of technical regula-

tions for the operation of all stations. These rules require certain classes of stations to use certain wave lengths, and also waves of a certain technical form, difficult enough to obtain even in the laboratory. Ship stations must cut down power when within certain distances of *naval and military stations*, and commercial stations can operate only during the second half of every hour, and then only on condition that *naval or military stations* have no "important" business to transact.

Four principal objections operate against this bill:

1. The wording and tone of the general provisions leave no room for doubt that the bill was designed by naval officers to subordinate commercial and private interests to naval and military interests.

2. The power given to the Secretary of Commerce and Labor to grant or withhold licenses at his discretion is excessive, and might lead to gross abuses. To suppose that one person in a short term of office could gain a comprehensive knowledge of so large a subject—one which he must handle as a dictator—is absurd. The plan is impracticable and impossible.

3. The proposed technical regulations are arbitrary, unproved, and purely experimental. Their adoption would lead to endless confusion and a tangle that would take more than one bill to rectify.

4. The proposed regulations would force immediate expensive changes in wireless telegraph apparatus, and would probably bankrupt all but one or two commercial companies whose foreign credit might save them. The act is practically confiscatory.

Little danger is there that this act will become a law. It is valuable, however, as an illustration of the extremes to which hasty ill-considered legislation can go when pushed by a single interest. Radiotelegraphy is in its infancy and the facts must be met in a broad non-partisan spirit. A representative commission in conference can settle these questions with minimum interference to legitimate interests and at the same time with maximum benefits to all concerned.

The Linden Museum at Stuttgart

THANKS to the untiring efforts of the late Count Karl von Linden, the city of Stuttgart, Germany, has a geographical and ethnological museum which is remarkable for the extent and character of its collections.

Originally intended as a museum of a rather commercial character, to acquaint Germans with the customs and products of foreign countries, the institution has broadened considerably and become more scientific in character. Von Linden recognized that the time was not far distant when most of the savage peoples of the world would cease to follow the ways of their ancestors, and that, under the influence of civilization, many an old art and handicraft would be forever lost. It was imperative for some scientifically organized and conducted museum to preserve the records of primitive civilizations.

Thanks to his personal efforts, he rapidly collected a large number of costumes, carvings, weapons, of savage workmanship, and a vast amount of other exceedingly valuable ethnographic material. So rapidly did this collection grow that in 1910 it was necessary to erect a special building in Stuttgart, which in dimensions and beauty of architecture compares favorably with the largest museums of the kind in the world. The new museum was officially opened on May 25th, 1911. Unfortunately, von Linden did not live to see that event. He died on January 15th, 1910.

In the von Linden collections will be found specimens from every country in the world. Africa, Asia, North and South America, Polynesia, Australia—all are represented by countless objects of great interest, such as weapons, carvings, head-dresses, shields, canoes, idols and the like. This material was contributed for the most part by government officials, missionaries and travelers. Some divisions are more complete than others. Moreover, there are some duplicates. For the purpose of completing the imperfect collections, the museum is prepared to exchange its duplicates for objects which it does not already possess. Thus, while the American Indian of the Far West is well represented, the museum feels the need of specimens from Northwestern Canada, Mexico, Central America and South America. Collectors and museum directors who desire to enter into exchange relations with the Linden Museum may address the director of the Museum für Länder- u. Völkerkunde (Linden Museum), Stuttgart, Germany.

* This is an abstract of a paper published in full in the current issue of the SCIENTIFIC AMERICAN SUPPLEMENT.