

esting case of the Bell telephone of thirty years ago. If this should prove true, it will show not only the value of fundamental patents, but that which is of equal importance, namely, to have the claims so drawn as to properly cover both methods and apparatus.

THE NEED OF A PURE-FOOD LAW.

BY CHARLES RICHARDS DODGE.

The disclosures of the unsanitary methods in use at Western packing houses, recently brought to the attention of the President and now sought to be controlled and remedied by special governmental inspection, as provided in the Beveridge amendment to the Agricultural Appropriation bill, lately passed by the Senate, will, if concurred in by the House of Representatives, bring about a wholesome check on the preparation of improper products for human consumption.

The fact that the proposed law covers the preparation of only a small part of our foods seems to have been wholly lost sight of. What is true of such meat foods as are derived from cattle, sheep, goats, and swine (chiefly canned and prepared meats or lard) is equally true of a great range of other foods, such as fowls, game, fish, and eggs, and a vast number of non-flesh or fish foods, none of which are in the least protected by the Beveridge amendment, and which may in an equal degree become sources of danger to food consumers. It is not generally known that a proper pure-food law has been before Congress for some time, but it has not progressed as rapidly as its friends had hoped.

The pending bill on meat inspection fails to provide for the official examination of storage foods, such as fish and game, sometimes kept for a period of four or five years in cold storage.

As everybody knows, the prevailing custom in dressing poultry for market is to retain the viscera and contents. In market parlance such fowls have not been "drawn." It is possible—it is a fact—that the changes in the viscera and unremoved contents will in time impregnate the entire flesh of the fowl, and to overcome the very perceptible effects of the changes which have been produced after long storage, a certain "purification" with chemicals must be resorted to before the poultry can be put upon the market. Such treated fowls are common.

The many cases of ptomaine poisoning that are reported, and which are often directly traceable to the use of canned fish or shellfish, are caused by unwholesome conditions for which the packers are responsible. If the product has not been properly sterilized when first put up, in time the fact is made evident by a bulging outward of the ends of the cans. These "blown" cans are repunctured to let off the gases of decomposition, and the contents treated with some preservative solution, such as benzoate of soda, after which they are resealed and put upon the market, to be sold to the consumer as wholesome food, and at the prices of wholesome food. At the Paris Exposition, where the writer had charge of the American food products, we frequently found these blown cans.

There is a stringent law which prohibits the importation of liquid eggs; that is to say, eggs removed from the shell and shipped to us in bulk from other countries. Formerly large quantities of such eggs, preserved with salt, were shipped in barrels from China, to be used in the tanneries. As new methods in the preparation of leather came into vogue, the demand for liquid eggs for the purpose declined. They were then shipped to us as food for human consumption, but preserved with boracic acid instead of salt, the bakeries being the purchasers. While liquid eggs are now excluded from importation, there is no law to prevent the sale of liquid eggs produced in our own country, and large quantities of "broken" eggs, and even malodorous eggs, treated to remove the odor, are sold to the bakers. Can any one say that a stringent federal law is not needed to correct such an abuse?

In the matter of tomato catsup, while it can be prepared without preservatives by proper sterilization, the fact remains that preservatives as a rule are necessary. The tomatoes, coming to the factory in larger quantities than can be worked up immediately, begin to decay; they are accessible to swarms of flies, and after none too careful sorting the pulp is placed in barrels, where in time it loses color, and it not only becomes necessary to use preservatives, but coloring matters as well, or the public would not buy the bottled product.

Among the many baking powder adulterations may be mentioned ground stone. A powder of this description, recently placed on the market, was enlarged under the microscope 120 diameters. The adulteration amounted to over 25 per cent.

Much of the so-called gluten flour sold on the market is either adulterated with wheat flour or is not gluten flour at all.

While there are a few instances of injurious food adulteration, there is a large class of adulterated foods that may not be deleterious to health. They may have

been prepared in a cleanly way, and appear quite as appetizing as pure foods; but if they lack nutritive value, by means of certain manipulation, or substitution of cheaper substances, or by the abstraction of any valuable or necessary ingredient, such foods are sold claiming to be what they are not.

When the public health is so menaced, it is time that a proper pure-food law should be put upon the statute books, with ample provisions to carry it out.

THE BRITISH NAVAL PROGRAMME FOR 1906.

The estimates for the British navy during the forthcoming twelve months ending March 31, 1907, show a further diminution, the reduction amounting to \$7,500,000 over those of the previous year. The result is that within two years there has been effected a reduction of \$25,000,000 in the naval expenditure of the country. For the present year the appropriation is \$159,337,335, of which total \$46,260,655 is to be devoted to the construction of new vessels, representing a saving of \$1,865,350 under this heading.

Though the programme does not contain any sensational features, yet at the same time it illustrates the active work of reorganization which is at present being carried out in all the departments relative to the naval organization, and several economies have been effected. One of the most notable features of this revising policy is the withdrawal of all the subsidies to the mercantile shipping companies for armed merchant cruisers, with the exception of the Cunard Steamship Company, whose whole fleet is still to be retained at the disposal of the Admiralty, and the steamers of the Canadian Pacific Railroad Company, the contract in regard to which has not yet expired. By the abolition of these subventions a sum of \$606,900 will be saved.

In regard to the new constructional programme for the ensuing twelve months, the following thirty-three vessels are to be laid down: Armored vessels, 4; ocean-going destroyers, 5; coastal destroyers, 12; submarines, 12.

In comparison with former years this is a somewhat modest programme, but as was pointed out in the SCIENTIFIC AMERICAN a few weeks ago, the Admiralty had decided upon a restricted naval construction policy for the present, to be increased if the exigencies so demanded; and although the administration has since changed, the new government evidently intends to proceed on somewhat similar lines.

In addition to the foregoing, however, there is at present a formidable programme in hand, since the following vessels are at present under construction: Battleships, 6; armored cruisers, 10; coastal destroyers, 12; ocean-going destroyers, 5; destroyer special class (very fast ocean-going), 1; submarines, 15; total, 49; and a new royal yacht and repair ship.

The construction of the recently-launched battleship "Dreadnought" is to be pushed forward with all speed, so as to be ready for commission early next year. In the estimates no particulars of this vessel are vouchsafed beyond the estimated cost, which is \$8,987,485, and the fact that it will be ready for sea within fifteen months of the laying of the keel. With regard to the destroyers, the coastal type are to be of 26 knots speed, while the ocean-going craft of this class are to attain a speed of 33 knots. The construction of the special fast ocean-going destroyer has not yet been commenced, though the contracts have now been completed and the work will soon be in progress. This vessel is purely experimental, the contract speed on trial to be 36 knots per hour. The submarine vessels are well under way, so as to be ready for the six submarine bases established round the coast and which are now in course of erection.

During the past year the navy has been augmented by 49 vessels made up as follows: Battleships, 3; armored cruisers, 8; second-class cruisers, 1; scouts, 8; destroyers, 16; submarines, 13; total, 49.

No details are advanced concerning the type of vessel to be adopted in connection with the four armored vessels authorized in the programme for the present year. Two, however, are to be constructed in government dockyards, and from this fact, together with the fact that considerable alterations are to be carried out at Portsmouth dockyard in connection with the shipbuilding berths and facilities, it is believed that they will be modeled upon the lines of the "Dreadnought." This hypothesis is supported by the speed with which this vessel is being constructed, so that actual data regarding the advantages of such a fighting unit in practical operation may be gained, and thus form a tangible guide in the construction of future battleships; while the fact that heavier sums are to be expended upon armor plates and guns, amounting to \$1,059,085 and \$500,000 respectively, tends to support this view. The speed with which the construction of the "Dreadnought" is being carried out, however, fulfills another important factor. By this experiment the Admiralty will be able to obtain conclusive data concerning the shortest time in which such a vessel can be constructed, so that should any other power embark upon an abnormal shipbuilding programme,

the Admiralty, owing to their unique position for rapid construction, would be able to supersede the other power's efforts, and thus have a superior fighting unit in commission at the same time. The British authorities have boldly stated that the policy in future is to be a waiting one, in the sense that they can either, in the government or private dockyards, construct and pass a vessel into the active fleet in half the time required by other nations.

With regard to the present estimates, there is one very prominent fact, and that is the small amount of information that is being conveyed therein to the public, though it is apparent that widespread alterations and improvements have been effected all round, conducing to the greater efficiency of this first line of defense. In regard to the guns, numerous improvements have been effected in the latest patterns of breech-loading weapons. Steel of a greater tensile strength and higher tenacity has been introduced, both for the construction of new guns and the repair of the older types. The sighting arrangements have also been completely overhauled, and the re-equipment of the fleet in this direction is being carried out as rapidly as possible.

With regard to liquid fuel, the Admiralty state that this is being extensively developed. The torpedo boat destroyer "Spiteful," which is fitted with oil-firing apparatus exclusively, is being employed as a training ship for the engine complements in the manipulation of the oil-burning apparatus. Four of the present battleships in commission are equipped with this steam-raising system, while those already in operation in two other battleships are being replaced with the latest type, and all the vessels now in course of construction and nearing completion are to be similarly equipped.

The forthcoming year will, however, rank as an important one in the annals of naval shipbuilding, since it marks the passing of the reciprocating engine and the introduction of the Parsons marine turbine. The Admiralty state that the success of the numerous and severe experiments with this propelling machinery in the cruiser "Amethyst," combined with the results attained therewith in the case of the mercantile marine, is such that all the vessels authorized in the programme for the coming year are to be fitted with turbine machinery.

Wireless telegraphy also is to be developed on a considerable scale as a means of communication between vessels. All the stations round the coast are now exclusively operated by the coastguards. During the coming year three further stations are to be established. In this connection it may be pointed out that the naval authorities are experimenting with a new system, which it is anticipated will become highly successful. During the recent maneuvers communication was established between the various vessels over a distance of 2,000 miles, with complete satisfaction under the most difficult conditions.

Extensive alterations are to be carried out at the Portsmouth dockyard, which constitutes the premier naval station, and which will involve an outlay of \$12,500,000. These improvements have become imperative in view of the rapid increase in the dimensions and displacement of modern war vessels. The building slip upon which the "Dreadnought" was constructed is to be lengthened, so as to be able to accommodate vessels up to 700 feet, for some of the latest warclads will exceed the "Dreadnought" in length, while two new repairing docks are to be constructed. At present there is only one dock in which the "Dreadnought," owing to its great size, can be berthed. The two proposed new docks will be each 700 feet in length, so that there will be adequate provision for future developments in warship construction. The improvements in this connection which have been in progress for some years past at Devonport, the second dockyard, have now been completed. One battleship is to be constructed at least every year at Portsmouth, and the time limit imposed for such work is to be two years.

STEAM JACKETING INVESTIGATIONS.

The following conclusions are announced by A. L. Mellanby in an article on Steam Jacketing published in the Inst. Mech. Engin. Proc.: (1) With such an engine and a boiler pressure of 150 pounds per square inch, the best mean pressure referred to the low-pressure cylinder is about 40 pounds per square inch. (2) The jackets have their maximum efficiency when the whole of the high-pressure and the ends of the low-pressure cylinders are jacketed with high-pressure steam. (3) The total indicated horse-power is slightly reduced when jackets are applied to the high-pressure, but considerably increased when they are applied to the low-pressure cylinder. (4) Jackets have little effect on initial condensation in the high-pressure, but considerable effect when applied to the low-pressure cylinder. (5) The temperature cycle of cylinder walls next to the steam is considerably less than that of the steam. (6) The greater part of the missing quantity is due to leakage and not to initial condensation.