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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

LESSONS AND RESULTS OF THE BATTLESHIP CRUISE.

In view of the bitter criticism with which it was assailed, when the proposal to send a fleet of sixteen battleships from the Atlantic to the Pacific coast was first made public, the return of this same fleet to Hampton Roads after a 42,000-mile cruise around the world, with every ship in first-class shape and the *morale* of officers and men greatly improved, is a tribute to the far-sighted sagacity which projected the voyage.

It must be admitted, even by the most conservative, that the spectacle of this most imposing array of first-class fighting ships, steaming in perfect order and on schedule time from port to port across all the seven seas, has had the effect of raising the prestige of our navy in every quarter of the world. To those of us who keep in close touch with the development of naval construction, and are familiar with the pages of the naval annuals, the numbers and quality of the fighting ships of our navy and its relative strength, would be pretty well known, even if no opportunity were given to look at the ships themselves. But for the great world at large, diagrams and tabular comparisons give, after all, only a vague idea of what a fleet of modern battleships actually means. And, therefore, the presence of our ships in the leading ports of the world has afforded an object lesson as to the appearance, quality, and power of the fighting material of the American navy, which could have been obtained in no other way.

One of the most gratifying results of the cruise has been the enthusiastic and unmistakably friendly reception which was accorded at every port where the ships let go anchor. If any American imagined that the rapidly-increasing power and wealth of this country was regarded with suspicion, distrust, or active envy, surely the whole-hearted cordiality with which this concrete expression of our strength was everywhere received will effectually banish the idea from his mind. Our national policy of friendly isolation; of careful detachment from the entanglements of foreign alliances; has not been misinterpreted. It is significant, moreover, that the most splendid receptions of all were those accorded by the countries over which fly the British and Japanese flags; a fact that proves surely, if it proves anything at all, that keen naval and commercial rivalry need place no necessary embargo upon international amity and good will.

The fact that the fleet covered 42,000 miles without a breakdown of any consequence, and this, in spite of the fact that some very heavy gales of wind were encountered, should set at rest any doubt as to the quality of the machinery—a point upon which many fears were expressed at the outset of the cruise. Furthermore, the successful navigation of the fleet is a fine tribute to the ability of our officers to handle the largest ships in fleet formation, take them into and out of harbors of widely different character, and navigate them through seas and straits that require professional skill of the highest order when, as in this case, many ships are sailing the same course in close proximity to one another. Not a single ship has grounded or been in collision throughout the whole fourteen months of voyaging.

The ill-timed criticism made at the commencement of the cruise, to the effect that the time would be wasted and that the ships had much better be employed in regular practice cruises, maneuvers, and target practice, is shown to have been ill judged by the fact that, during the trip, the ships were constantly engaged in maneuvers and had lengthy target practice, and that during the latter, records were obtained which show the hitting power of our ships to be greater than at any period in their history. And just here it is fitting to say a word in praise of the enlisted men. Admiral Evans, in his recent autobiography, makes no effort to conceal his unbounded admiration for the American sailor; and he has repeatedly, during the last two or three years, stated his belief that man for man, our enlisted men are the equals, and in some respects the superiors, of any afloat. That his estimate is not too high is proved, surely, by the many tributes as to the fine appearance and behavior of our men, which have been freely given by government officials and the press in general at the various ports visited. In physique, education, intelligence, self-respect, and patriotism, the enlisted men of to-day stand at a higher level than ever before in the history of the American navy.

There is one fact brought out by the cruise, however, which must go far to offset the general satisfaction which must be felt at its successful completion. We refer to our great shortage of colliers, and to the fact that, had it not been for the foreign bottoms in which coal was shipped to the fleet at the various points of rendezvous, it would have been impossible for this voyage to have been made. It is not stretching a point too far to say that here we find the most important lesson of the whole cruise. Had war flamed out at the shortest notice, when our fleet was, let us say, on the coast of Australia, or at Suez, it would have been as helpless, and even more so, as a fleet of dismantled frigates in the days of sail power and the smooth-bore. With coal declared a contraband of war; with no colliers of our own available to carry the necessary fuel; our sixteen battleships, for all their tremendous fighting power, would have been as useless, as far as active operations on the high seas are concerned, as so many anchored, floating batteries. Undoubtedly, the greatest need of the navy to-day is a fleet of large and fairly fast colliers, built expressly for naval purposes.

Finally, the successful completion of the cruise must be considered as a sharp rebuke to those critics of our navy who, at the very hour that it was starting out from Hampton Roads, endeavored to persuade the people of America that these selfsame ships were poorly designed and defectively armored, and that in anything of a seaway the most important of their guns would be completely drowned out by the heavy water that would come aboard. None of these predicted troubles occurred. That the windward broadside batteries on the main deck would be washed with spray under certain conditions, such as did actually occur during the cruise, was fully expected; but this is a condition that obtains in the ships of every navy that carry broadside batteries on this deck. With this exception, our vessels have lived fully up to their designation as *seagoing* battleships; and the people of the United States may rest satisfied that ship for ship, gun for gun, they are the equals of any vessels of the same size and date in the navies of the world.

THE ELECTRIC POTENTIALITY OF FRUIT AND VEGETABLES.

In the course of some investigations in fruit and vegetable physiology an interesting discovery has been made by an English electrician. This is the conclusive fact that fruit, including nuts as well as grapes, apples or oranges, and vegetables are small secondary batteries or storage cells. True the degree of electric potential is slight, varying with the nature of the fruit or vegetable, but nevertheless a certain amount of electricity is stored within, the presence of which can be detected if a sufficiently delicate galvanometer is used.

The fact that the earth is always charged with negative and the air with positive electricity is well known, the charging of the earth being secured by water, which acts as the electrolyte. Familiarly in plant and vegetable life the electrolyte represented by the sap is in constant circulation so long as the soil conducts, and the cells of the plant become converted into small low-powered accumulators, there being at least one cell so charged by the earth and air in all representatives of the plant kingdom, whether tree, fruit, or vegetable. Moreover, this electric charge is retained, so perfect is the insulation by Nature, until the latter is either broken down by man or from the effects of decay which last named action serves to destroy the natural insulation between the positive and negative cells.

The process by which fruit becomes electrically charged is very simple. Negative electricity is supplied by the earth to the soil and the extent of such conductivity varies with the degree of moisture in the soil. Dry earth is a non-conductor, and this fact is strongly evident from the fact that unless the roots of the plant secure a certain percentage of moisture the plant dies. The moisture in the soil provides the sap which spreading upward flows to the uttermost extremities of the plant through the various arteries existing for such circulation. The leaves commence to burst forth, the buds becoming charged with negative electricity from the earth through the electrolyte. As the leaf expands it also becomes inductively charged with positive electricity from the air, as likewise do the flowers. When the fruit commences to form, however, nature provides an impermeable insulator represented by the rind or peel enveloping the fleshy portion of the fruit, but at the same time the negative charging continues from the earth to the seed center or core through the stalk, this central negative cell being insulated from the positive fleshy cell by a thin skin.

In order to test this thesis the experimenter secured a specially designed instrument of sufficient sensitiveness to record such an infinitesimal flow of electro-motive force as exists in the fruit. This constituted a Kelvin astatic galvanometer of 80,000 ohms resistance, in which the magnetic reflecting indicator is so light as to be suspended by the single thread of a spider's web. This instrument indicates the flow of current upon a special scale divided into millimeters. This scale may be represented by the following diagram:

+	zero 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8	−

When the negative terminal of a battery is attached to this instrument at the left-hand terminal the needle deflects to the right and *vice versa*.

The experimenter, instead of a battery, attached the stalk end of the apple which is the negative pole of the fruit, and the same effect was produced, but upon the lower end or positive pole being connected, the reverse deflection occurred. Such a reversal of sign could not occur merely by reversing the fruit if the action were due to chemical agency. Furthermore, such reversals were observed not to be momentary in character, but remained constant until the insulation was broken down or decomposition set in. In the course of his experiments with several types of fruit the investigator found the apple to be the most powerful cell, i. e., having the greatest degree of electric potential, while the orange was also found to be of large capacity. In this latter instance, and the peculiarity applies to all such fruits where the flesh is divided into separate sections, each alternate division is positively charged, the cells being insulated from one another by the skins inclosing each section. Such fruits therefore constitute in reality a combination of storage cells, additionally insulated by the rind or peel. In the case of the apple or pear the positive cell was found to comprise the fleshy portion, the core constituting the negative cell. By cutting such a fruit in half, the construction of the system may be plainly followed.

The experimenter is continuing his experiments in the same direction and many interesting developments respecting Nature's electric system, and the possible value of such from a dietetic point of view, are anticipated. In the case of vegetables the same peculiarity exists, although in a less pronounced degree, since the skins of many are very porous and consequently are not so efficient an insulator.

PSEUDO-VOLCANIC ERUPTIONS.

Recently reports were printed in various California newspapers to the effect that a volcano had burst forth in one of the canyons of the Santa Monica Mountains near Los Angeles. The point at which the pseudo-volcano broke out is about 200 yards from the Pacific Ocean and some twelve miles from the city of Los Angeles. Here sulphurous smoke rises from a little mound of Miocene shale and a few inches below the surface the ground is red-hot, charring or even setting fire to sticks thrust into it. But throughout this region oil-bearing shales are found near the surface and the soil is soaked with petroleum. The shale may have ignited spontaneously; lightning or a fire set by campers may have started the combustion. In any case the phenomenon is accounted for easily, without recourse to the theory of a volcanic eruption. Reports of similar incidents in this region have been traced to fires in oil-bearing strata. No serious harm has resulted from the fires, as the nearest oil-producing wells are at least ten miles away.

Recently there were accounts in some French papers of an eruption in an abandoned mine-shaft, and some years ago it was stated that there was an active crater on the top of an Alpine peak. The burning shaft produced a highly creditable imitation of an active volcano, great, heavy clouds of black smoke rising from it, and a fine, warm dust falling on the surrounding houses and fields, followed by flames and stones rained on the dwellings. The inhabitants in terror took flight; but an investigation proved that the pseudo-volcanic eruption had been caused by an explosion of fire-damp in the shaft. The basis for the story of an active volcano on the Alpine peak was a forest fire on a lower mountain.