the squadron that has lately returned from southern waters. It was known two days beforehand that the trial would occur and that it would be made under full power and would last for four hours. The fastest speed was made by the "New York," the slowest by the "Texas." The original trial speeds and the speeds made on this occasion are as follows: "New York," rated 21 knots, speed 19·2; "Brooklyn," rated 22 knots, speed 17 knots; "Massachusetts," rated 16·2, speed 14·8; "Indiana," rated 15·5, speed 14·0; "Texas," rated 17·8, speed 12·2. The falling off is therefore as follows: "Texas," 5 6 knots; "Brooklyn," 5 knots; "New York," 1·8 knots; "Indiana," 1·5 knots; and "Massachusetts," 1·4 knots. The best performance was that of the "New York" (always a most consistent vessel), for she had been eight months out of dry dock, longer, indeed, than any other ship, and her bottom was necessarily foul. The poor showing of the "Brooklyn" is attributed in part to an exceptionally foul bottom, due to six months' service, and to recent changes in the engine and boiler room force, though it is hard to understand how these causes alone could account for the woeful disparity between the speeds of 22 and 17 knots. Of the battleships, the "Indiana," which had not visited a dry dock for seven months, made a better showing than the "Massachusetts," which had left the dry dock only one month before the trial took place. It is stated, moreover, that the "Indiana" was able to use forced draught in only one of her boilers. It is claimed that the poor showing of the "Texas" was due in part to an accident to her machinery.

Now it is evident that the loss of speed in warships must be due to general causes which affect every vessel, irrespective of its style or nationality. The instances which we have quoted in our own navy can be duplicated in any other; and although in her latest ships England has very wisely adopted the natural draught speed as the rated speed, her older ships do not pretend to reach in service the speed attained on forced draught trials. The forced draught trial speed is fictitious, as we have said, for many reasons. In the first place, the conditions of the trial are unnatural and in the nature of things impossible of repetition. The contractors are allowed to select the very best steam coal and place a gang of picked and experienced stokers at the furnaces. The coal is always carefully screened and selected of such a size as will give the very best steaming results. Under service conditions, the coal is frequently inferior stuff, certainly not to be compared with the selected fuel of the trial trip; and the engine and boiler room force is continually subject to change, men familiar with the engines and boilers leaving and new men having to be broken in to their duties. Thus differences in coal and crew may easily account for a loss of from a knot to a knot and a half of speed.

Again, it is a well known fact that warships grow heavier as they grow older. Numerous improvements are made from time to time, which usually involve the addition of weight in smaller or larger amounts, the draught of the ship growing greater year by year. Auxiliary engines are added within and heavy bilge keels are attached without the ship. Old slow-fire guns are replaced by longer and heavier rapid-fire pieces, and this again involves a proportionate increase in the ammunition supply. The personal belongings of the officers and crew tend to increase rather than diminish in weight; so do the stores; and as for coal supply, it is an easy matter when preparing for a long cruise to cram into the bunkers, by "close stowage," a few hundred tons more coal than the ship carried on the trial trip.

Of course, the most active cause of reduction of speed is the marine growths which, especially when a ship is in tropical waters, soon cover the submerged hull. This alone may be answerable for the loss of two knots of a vessel's speed, and coupled with the causes already referred to will explain the great disparity between the speed of our ships as set down in the official tables and as actually accomplished under service conditions. The surest way to maintain some parity between the trial and the service speed is to run the trial trips under natural draught with the ordinary commercial coal as used under service conditions, and to sheathe and copper all the warships of 2,000 tons displacement and upward. We would then be no longer in the false position of having our vessels rated at speeds which are from two to four knots greater than they can accomplish in actual service.

POTASSIUM CHLOROPLATINITE.

A NEW AND SIMPLE METHOD OF PREPARATION.

Photographers who use large quantities of chloride of gold have long been in the habit of preparing it for themselves; and now that platinum printing and platinum toning involves the use of large quantities of a platinite salt, they would prepare it too, but that hitherto the process has been sufficiently complicated to be beyond their power.

In a recent issue of the Bulletin of the Chemical Society of France, M. Vèzes described a process so simple that it will be within the capacity of any one.

Platinic chloride, $PtCl_4$, is as easily made as the ordinary "chloride of gold," by simply dissolving spongy or scrap platinum in aqua regia, and evaporating to dryness by a gentle heat. To convert the platinic into the platinite salt, to remove the extra two atoms of chlorine, Mr. Vèzes adds to a quantity of water, considerably more than it can dissolve, even at the boiling point, of platinic chloride, and to the mixture, molecule for molecule, of neutral potassium oxalate, about 37 grains of the crystallized oxalate for each 100 grains of the platinic chloride. When heated to the boiling point, the oxalate reacts on the dissolved part of the platinic salts; carbonic acid is evolved, and the solution from a yellow changes to a bright red. The undissolved platinic salt then begins to dissolve, and if the temperature be kept up, will altogether disappear, leaving the solution a deep bright red.

The solution is now set aside, and if the evaporation has been sufficient, crystals of potassium chloroplatinite, to the amount of 80 per cent of the theoretical quantity, will be deposited; while the addition of alcohol to the mother liquor will precipitate the rest.

THE PROPOSED UNIVERSAL DAY.

BY LIEUT. R. SCALLAN, R.A.

If the government of the United States will but ratify the conclusions arrived at in Washington some thirteen years ago, it is possible that the 1st of January, 1901, will witness not only the dawn of a new century, but also the inauguration of what has come to be known as the "universal day."

This question of a common method of reckoning time is of very old standing. Sir John Herschel, the celebrated astronomer, advocated the proposition strongly in his time, and pointed out the advantages arising from such a course, as well as the defects of the astronomical or sidereal system, but no government was found bold enough to uphold the scheme in the face of the opposition of other nations, and until the present time, there has been no prospect of unanimity on the subject. The confusion and inconvenience resulting from the disparity in time all over the country was recognized by the President of the United States as far back as 1884, when he invited the civilized governments of the world to send representatives to an international conference at Washington, to devise means and ways for the rectification of the existing difficulty. After a lengthy discussion, the twenty-five representatives who attended in response to the invitation adopted seven resolutions in all, practically unanimously, most of which have since borne fruit. The first three related to the now established method of computing latitude and longitude, and the adoption of the Greenwich longitude as a prime meridian. The remainder were concerned in the unification of time, especially at sea, and the creation of a "universal day."

Naturally, the unification of time is more important to mariners than to landsmen, as the intricacies of astronomical time, as laid down by the "Nautical Almanacs" or Ephemerides of the world, are a constant source of trouble to the captains and others who take observations at sea. Still, landsmen who have dealings and telegraphic correspondence with many countries are often very much "at sea" in consequence of the disparity in the time of day over the universe.

The present agitation is designed to effect a remedy for this objectionable state of things, by establishing a common day everywhere, not necessarily to interfere with the local standard time, but to facilitate communication on land, and calculation on the ocean. On land, for instance, in drawing up time-tables, railway companies have had to make allowances for over seventy differences of time between New York and San Francisco. The Washington conferees thought that the best plan would be to take the mean solar day, or civil time of Greenwich Observatory, in England, and make it the time of the world. The hours also should be altered to the Italian fashion, and run from zero to twenty-four, so that the confusion arising from the use of the terms A.M. and P.M. might be abolished. The majority of astronomers and practically all master-mariners have indorsed the proposal, but with the stipulation that such a change should only be made at a notable epoch of time; hence it is suggested that the first day of the twentieth century would be most suitable for the inauguration of the scheme.

The Royal Society of Canada is now endeavoring to revive the proposal in the interests of the maritime world, and has solicited the opinions of the various nations who publish Ephemerides. The reason for the seeming haste is that these publications, notably the "Nautical Almanac," which is under the supervision of the British Lords of the Admiralty, are usually got up for the press some three or four years in advance, so that it is high time to come to some definite decision if the almanacs of 1901 are to be altered. There are nine countries in all that issue Ephemerides, and of these the United States and Great Britain are the most influential. Of these nine, six governments have expressed their approval of the universal day scheme in unqualified terms. They are: Austria, Brazil, France, Great Britain, Mexico and Spain. The Lords Commissioners of the Admiralty in England have formally consented to the change if unanimity can be obtained, promising also the support of the British government. Germany and Portugal have not yet given a definite reply, but it is believed that the sentiments of the authorities of these countries are favorable to the plan.

Our own government, however, has furnished a great surprise in this matter, as in 1896 a rather adverse response was sent to the Canadians. President McKinley may now regard the matter in a more kindly light, and bestow his approval on what was undoubtedly an American idea originally. With the change would be destroyed the romance surrounding the sidereal day. No longer will the facetious journalist puzzle the uninitiated by declaring that he can publish accounts of events occurring in Europe "actually hours before they happen, sir!" and that delightful tale of how Phileas Fogg won his wager to the very minute in "Round the World in Eighty Days" will be relegated to the musty shelves of oblivion as a relic of barbarous antiquity.

THE GATHMANN SHELL TESTED.

The first of the two experiments with the new Gathmann shell took place at Sandy Hook on May 9, in the presence of ordnance officers of the army and navy. The Gathmann shell employs for its bursting charge guncotton in the place of powder, which had not always been satisfactory. Sometimes there is not sufficient gas generated by powder to burst the projectile, and this is particularly true in armor-piercing shells. The great danger from the use of guncotton in shells is premature explosion. The inventor, Mr. Gathmann, believes that his projectile will not explode inside the gun and that it will not explode prematurely on loading it, and that the wet guncotton will only explode by detonation. The chief recommendation of the shell was that it could stand the use of smokeless powder as a propellant. In the experiment an old 15-inch Rodman gun was taken to the beach and a very heavy charge of smokeless powder was placed in it; then a 15-inch Gathmann shell containing 82 pounds of wet guncotton was put in place. The gun was then taken to a hole twenty feet deep which had been dug in the beach and was lowered to the bottom, lying horizontally. An electrical fuse was attached and the bore of the gun filled up with sand and stone to increase the strain of the explosion on the shell. The officers and interested parties got out of danger and the gun was fired. It was shattered with the force of the explosion, which blew out a cavity in the beach 30 feet deep and 25 feet in diameter.

The work of digging for the shell was very severe, owing to the peculiar nature of the sand. The remnants which were found are satisfactory to Mr. Gathmann and his associates. The guncotton had been driven into the sand with such force that it was almost pulverized and, as it was recovered, seemed to consist of about as much sand as guncotton. The breech end of the gun had been shattered and was found in small pieces for a space of 16 feet. The base part of the bronze shell was also found much broken in the breech end of the gun. It was bright on the inside, and this, when added to the evidence of the unexploded guncotton found in the sand, showed that although the shell itself had been broken by the explosion, and although the detonator undoubtedly exploded, the Gathmann arrangement for protecting the charge of the shell had worked perfectly. The muzzle end of the gun for 5 feet was broken into five pieces longitudinally. A portion of the forward end of the shell was found about 31½ feet from where the muzzle of the gun had been. The official report on the experiment will be looked for with interest.

DEATH OF PROF. BUECHNER.

The death of Prof. Frederich Carl Christian Ludwig Buechner, the author of "Force and Matter," is announced. He died at Darmstadt, Germany. His great work is regarded by many European men of science as of equal importance with Darwin's "Origin of Species;" it was originally published in 1855, and has been translated since into every language in Europe. In it the theory of the ultimate indestructibility of force and matter, which is now generally accepted by scientists, was promulgated for the first time. The general principles of a complete philosophy in harmony with modern discoveries in natural science were first outlined by him. Prof. Buechner developed his philosophy in later works, and a few of their titles are the "Psychological Life of Animals," "Nature and Science," "Life and Light," "Power of Hereditary Transmissions," "Facts and Theories of the Naturalistic Life of To-day."

Prof. Buechner was born in 1824 and became a doctor of medicine; he studied at Giessen, Strasburg, Wurtzburg, and Vienna. He occupied the position of professor at Tübingen, but lost his position in consequence of his philosophical doctrines. He then returned to Darmstadt and resumed practice as a physician.