Summing up the totals for battleships and cruisers combined, we get:

United States..... 43 ships, with a total displacement of 180,825 tons.
Great Britain ..... 208 " " " " " 1,158,005 "

Which shows Great Britain to possess a superiority in fighting ships of all descriptions of $6\frac{4}{10}$ to 1.

In the event of a war with that country, these are the odds against which we should have to contend at the outset.

As against this unpromising opening it will be urged that we are a resourceful and energetic people, and that we should quickly create a navy. To this it must be answered that modern navies are of slow growth—they are not created. The modern battleship, costly and intricate, puts a heavy discount upon mere resourcefulness and energy, of which we have abundance, and a heavy premium upon gun, ship, and armor building plant, of which, for the magnitude of the task in hand, we should find that we possessed an altogether inadequate supply. With every factory, mill and shipyard working at full blast, it would take from seven to ten years to cancel that preponderance of $6\frac{4}{10}$ to 1.

There is no sentiment in statistics.

It is certain, moreover, that Great Britain would steadily add to her fleets as the war progressed; and with her great shipbuilding facilities she could float six ships to our one, as the following facts will show: In reply to inquiries instituted by the British Admiralty last year to ascertain the extreme warship building capacity of the private yards, it was found that, if these firms were given a free hand as to the details of the designs, they could build another navy, equal in fighting strength to the whole existing British navy, in from two to three years! To this must be added the building capacity of the government dockyards and shops. The astounding resources revealed by this investigation call for no elaboration on our part to show that Great Britain could rapidly increase her preponderance of naval strength, if challenged to do so.

The fact that European diplomats seem disposed to take the British view of the question at issue makes it highly probable that, in the event of hostilities, we should have to engage this colossal navy, with the power of reduplication which lies behind it, unaided.

Incidentally, in closing, we would remark that the ink is scarce dry upon the paper in which our general in chief, Nelson Miles, has just told us that the very opening of hostilities with a great naval power would see every sea-coast city, on the Atlantic and Pacific, subject either to the humiliation of an indemnity or to the horrors of bombardment.

In making the foregoing comparison it is assumed that the United States would not submit to a conflict merely defensive—that her enterprise would soon cause the field of naval operation to become conterminous with the shore lines of both hemispheres. The estimate consequently assumes that the total force of both fleets would be available.

THE UNITED STATES BUREAU OF STEAM ENGINEERING.

Engineer-in-chief Geo. W. Melville, in his annual report for 1895, recommends that the sum of $300,000 be spent in providing the cruiser Atlanta with new machinery and altering her from a single to a twin-screw ship.

According to Brassey's Naval Annual, the Atlanta is a steel cruiser of 3,189 tons displacement and 16·33 knots speed. She carries two 8 inch guns, six 6 inch, two 6 pounder quick-fire guns, two 3 pounder quick-fire guns, and eight smaller quick-fire guns.

It seems that, though her present engines are of an obsolete type, the hull is "an excellent one, and well worth new machinery." With machinery of 5,400 horse power (her present horse power is 3,511), of the same type as that in the newly constructed Marblehead, the report states that we should "then possess a cruiser equal to any of her class afloat." The new machinery would weigh 142 tons less than the old; it would enable the ship to carry more coal; and it would give her 2 knots higher speed, equivalent to between 18 and 19 knots an hour.

The same changes are recommended for the Boston, a sister ship. The Chicago is at present being re-engined.

In these days of high speed cruisers, the above addition of 2 knots to the speed of these boats will practically add two new ships to our navy.

The value of liquid fuel for marine purposes is being determined by a series of tests on one of the torpedo boats of the Maine. It is recommended that one of the gunboats building at Newport News be made use of to carry out these experiments on a larger scale. Naval designers the world over have for some time past recognized the fact that if the use of liquid fuel can be rendered practicable in the navy, it will largely increase the radius of action of seagoing ships. To the United States the question of the use of petroleum fuel is of double importance, both on account of the abundance of our supply of this combustible and even more on account of our paucity of coaling stations. The range of action of the modern warship is limited by her coal capacity and the distance of her field of operations from the nearest coaling station.

A nation which possesses few of these must provide its ships with specially large bunker space, as in the case of the cruiser Columbia. Any device which will enlarge the fuel endurance of warships will be especially valuable to the United States; and there is nothing in sight to-day which would so effectually do this as the substitution of oil for coal in marine boilers.

Speaking of the use of water tube boilers in the navy, Mr. Melville recognizes the necessity for a boiler lighter than the well known Scotch boiler; and while admitting that many types of the water tube system have proved successful on shore, he is of the opinion that "no single type has yet made its appearance which can be regarded as an altogether satisfactory substitute for the Scotch pattern."

In view of the fact that the two cruisers Powerful and Terrible, of 14,000 tons displacement, now building for the English navy, are to be furnished with boilers of this type, the above statement by so distinguished an authority is significant. Mr. Melville evidently considers that for use in large ships the water tube boiler is yet in the experimental stage; and his opinion is shared by many naval experts on the other side, who strenuously opposed their adoption in these two costly ships.

THE JANUARY SKY.

Jupiter is still the only planet conveniently situated for observation. He rises now about 7 o'clock in the evening, so that by 10 o'clock he is well above the roofs and trees. The position of this planet among the stars is very interesting just now. On the first of January he is quite close to the fourth magnitude star δ Cancri, and a little south of the Beehive cluster in Cancer. Not only is a means thus offered by which those unacquainted with the stars may, with certainty, recognize this curious stellar region, but the picturesqueness of the view is increased, and a more striking idea of the profundity of space may be formed when one sees the united light of hundreds of distant suns outshone by the reflected rays from a comparatively nearby and insignificant planet.

Yet, although Jupiter may be called insignificant when compared with a sun, he is anything but insignificant when studied in his own character of a giant planet. It is an impressive thing, to any thoughtful person, to look upon a globe 1,300 times as large as the earth, and contemplate the bare possibility of its being inhabited, either now or at some future time. If I were asked, "What is the most instructive sight that the telescope reveals in the heavens?" I should be strongly tempted to reply, "The planet Jupiter, with his circling moons." There—and it is a spectacle not reserved for the possessors of the largest telescopes—one perceives the law of gravitation operating visibly on an enormous scale; one sees globes larger than the moon tracing out elliptical orbits so swiftly that a single evening's observation plainly reveals their change of place; one beholds eclipses with their mechanism displayed as the finest model could not do it; and the play of shadows on the face of another planet; and the movement of clouds; and the alignment of zones, shading off from a brilliant equator to dusky poles; and the rapid turning of a vast world upon its axis of rotation.

In reference to this rotation, I may remark that now, when the planet is visible the entire night, an excellent opportunity is presented to see one complete turn of Jupiter on his axis. Let the observation begin at 8 P. M. and end at 6 A. M. Between those hours the observer will have seen all sides of the giant planet in succession, and when he leaves the telescope the face of Jupiter will have resumed the appearance it had at the time his eye was first applied to the tube. And in the meantime he will have beheld many a scene that has puzzled the astronomers, for the surface of Jupiter is strangely and wonderfully variegated.

Venus is in Libra near Scorpio, and rises on the 1st of the month about 4 o'clock in the morning. At the end of January she will be in Sagittarius, rising about 5:30 A. M. Her reign is passing and will not be resumed until she reappears in the sunset next autumn.

Mercury is in Sagittarius at the opening of the month, too close to the sun to be observed, but about the 23d, when he is in the eastern part of Capricorn, he will be visible in the evening, more than 18 degrees east of the sun.

Mars is in Ophiuchus, moving toward Sagittarius, and on the 1st rises about 6 A. M.

Saturn remains a few degrees east of α Libræ, rising on the 1st about 3 A. M. and on the 31st about 1 A. M. But there are few who will care to break their rest even for the sake of beholding that most singular of celestial objects, a planet with rings, especially since, in the spring, Saturn will rise early in the evening.

Uranus is in Libra, not very far east of Saturn, and Neptune is in Taurus, well situated, but too faint for satisfactory observation, even with a telescope of considerable power.

The moon is waning when January opens, although but just past the full by a few hours. New moon occurs late in the afternoon of the 14th; first quarter on the evening of the 22d in Aries; full on the morning of the 30th in Cancer.

Perigee occurs an hour before midnight on the 3d, and apogee about the same hour of the night on the 19th. The moon is in perigee for a second time this month on the evening of the 31st.

The lunar conjunctions with the planets occur as follows: Jupiter on the 2d just before midnight (the planet will be less than 2° south of the moon, a pretty sight); Saturn on the evening of the 9th, invisible; Uranus on the morning of the 10th; Venus on the morning of the 11th; Mars on the morning of the 12th; Mercury on the morning of the 16th, invisible; Neptune on the morning of the 26th, invisible; Jupiter (second time), before sunset on the 29th.

The wonderful variable star Algol, in Caput Medusæ, is now well situated for observation. It will be at a minimum on the 9th, half an hour after midnight. The observer should begin to watch it, using either the naked eye or an opera glass, early in the evening, noting the gradual diminution of its light as compared with the small stars near it. It remains at minimum but a few minutes, although three or four hours are required for it to regain its full brilliance. Another minimum occurs on the 11th, at 9:23 P. M.

The star Myra, in Cetus, which is as remarkable among long-period variables as Algol is among short-period ones, is now brightening. It began to be visible with a field glass about the middle of December, and it will probably increase in brilliance for about two months. When brightest, it is sometimes of the third magnitude.

An occultation of the first magnitude star Regulus, or α Leonis, by the moon, will occur about ten minutes before 11 o'clock P. M. on the 3d.

The earth arrives at that point in its orbit which is nearest the sun at 1 o'clock on the afternoon of the 1st.

GARRETT P. SERVISS.

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Cycle Notes.

Two bicyclists, Theodore and Eddie Kraguess, arrived in San Francisco a week ago, having ridden on their machines all the way from Minneapolis. The route they traveled was 2,856 miles long, and they rode it in thirty-eight days, an average rate of seventy-five miles a day. Some days they rode more and some less, and occasionally they rode until nearly midnight in order to keep up the average. They did not make the trip for money or glory, but for pleasure. They had very trying times on the windy prairies, the sandy deserts, and the snow-covered mountains, and will not try to ride back again. They carried a tent, blankets, cooking utensils, and also food on the long desert stretches, although in the main they relied for shelter and food on the farmers.

It is said the Bavarian Minister of War has authorized the purchase of 9,000 cycles which are to be used for the infantry and sharpshooters.

A proposition has been made recently by bicycle riders to several agents and manufacturers of bicycles that the manufacturers get together in a convention and agree to reduce numerous parts of their different machines to standard proportions.

In some respects the makers have been obliged already to agree upon standard sizes or parts, such as rims and tires. There is no reason why a similar agreement should not be reached regarding the fittings of almost every part, so that any repair shop, supplied with a reasonable quantity of standard repair parts, should be able to put any make of machine in order at short notice.—N. Y. Sun.