RODNEY STONE.

A Reminiscence of the Ring.

By A. CONAN DOYLE.

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CHAPTER XII.

THE COFFEE ROOM OF FLADONG'S.

So boy Jim went down to the George at Crawley under the charge of Jim Belcher and his uncle to train for his great fight with Crab Wilson of Gloucester, while every club and bar parlor of London rang with the account of how he had appeared at a supper of Corinthians and beaten the formidable Joe Berks in four rounds. Jim had told me that he would make his name known, and his words had come true sooner than he could have expected it, for go where one might one heard of nothing but the match between Sir Lothian Hume and Sir Charles Tregellis, and the points of the two probable combatants. The betting was still strongly in favor of Wilson, for he had a number of bye-battles to set against this single victory of Jim's, and it was thought by connoisseurs who had seen him spar, that the singular defensive tactics which had given him his nickname would prove very puzzling to a raw antagonist. In height, strength and reputation for gameness there was very little to choose between them, but Wilson had been the most severely tested.

It was but a few days before the battle that my father made his promised visit to London. The seaman had no love for cities, and was happier when wandering over the downs, and turning his glass upon every topsail which showed above the horizon, than in finding his way among crowded streets, where, as he complained, it was impossible to keep a course by the sun, and very hard by dead reckoning. Rumors of war were in the air, however, and it was necessary that he should use his influence with Lord Nelson if a vacancy was to be found either for himself or for me.

My uncle had just set forth, as was his custom of an evening, clad in his green riding frock, his plate buttons, his Cordovan boots, and his round hat, to show himself upon his little crop-tailed tit in the Mall. I had remained behind, for, indeed, I had already made up my mind that I had no calling for this fashionable life. These men, with their small waists, their gestures, and their unnatural ways had become wearisome to me, and even my uncle, with his cold and patronizing manner, filled me with very mixed feelings. My thoughts were back in Sussex, and I was dreaming of the kindly, simple ways of the country, when there came a rat-tat at the knocker, the ring of a hearty voice, and there in the doorway was the smiling, weatherbeaten face, with the puckered eyelids and the light blue eyes.

"Why, Roddy, you are grand, indeed!" he cried. "But I had rather see you with the King's blue coat upon your back than with all these frills and ruffles."

"And I had rather wear it, father," I answered.

"It makes me glad to hear you say so. Lord Nelson had promised me that he would find a berth for you, and to-morrow we shall seek him out and remind him of it. But where is your uncle?"

"He is riding in the Mall."

A look of relief passed over my father's honest face, for he was never very easy in his brother-in-law's company. "I have been to the Admiralty," said he, "and I trust that I shall have a ship when war breaks out; by all accounts it will not be long first. Lord St. Vincent told me so, with his own lips. But I am at Fladong's, Rodney, where if you will come and sup with me, you will see some of my messmates from the Mediterranean."

When you think that in the last year of the war we had 140,000 seamen and marines afloat, commanded by 4,000 officers, and that half of these had been turned adrift when the peace of Amiens laid their ships up in the Hamoaze or Portsdown Creek, you will understand that London, as well as the dockyard towns, was full of seafarers. You could not walk the streets without catching sight of gypsy-faced, keen-eyed men, whose plain clothes told of their purses as plainly as their listless air showed their weariness of a life of forced and unaccustomed inaction. Amid the dark streets and brick houses there was something out of place in their appearance, as when the seagulls, driven by stress of weather, are seen in the midland shires. Yet, while prize courts procrastinated, or there was a chance of an appointment by showing their sunburnt faces at the Admiralty, so long they would continue to pace, with their quarter-deck strut, down Whitehall, or to gather of an evening to discuss the events of the last war or the chances of the next at Fladong's in Oxford street, which was reserved as entirely for the navy as Slaughter's was for the army or Ibbetson's for the Church of England.

It did not surprise me, therefore, that we should find the large room in which we supped crowded with naval men, but I remember that what did cause me some astonishment was to observe that all these sailors, who had served under the most varying conditions, in all quarters of the globe, from the Baltic to the West Indies, should have been moulded into so uniform a type that they were more like each other than brother is commonly to brother. The rules of the service insured that every face should be clean shaven, every head powdered, and every neck covered by the little queue of natural hair, tied with a black silk ribbon. Biting winds and tropical suns had combined to darken them, while the habit of command and the menace of ever-recurring dangers had stamped them all with the same expression of authority and alertness. There were some jovial faces among them, but the older officers, with their deep-lined cheeks and their masterful noses, were for the most part as austere as so many weather-beaten ascetics from the desert. Lonely watches and a discipline which cut them off from all companionship had left their mark upon those red Indian faces. For my part, I could hardly eat my supper for watching them. Young as I was, I knew that if there were any freedom left in Europe, it was to these men that we owed it, and I seemed to read upon their grim, harsh features the record of that long ten years of struggle which had swept the tricolor from the seas.

When we had finished our supper my father led me into the great coffee room, where 100 or more officers may have been assembled, drinking their wine and smoking their long clay pipes, until the air was as thick as the main deck in a close-fought action. As we entered we found ourselves face to face with an elderly officer who was coming out. He was an under-sized man, with large, thoughtful eyes, and a full, placid face—such a face as one would expect from a philosopher and a philanthropist, rather than from a fighting seaman.

"Here's Cuddie Collingwood," whispered my father.

"Hullo, Lieut. Stone," cried the famous Admiral very cheerily. "I have scarce caught a glimpse of you since you came aboard the Excellent after St. Vincent. You had the luck to be at the Nile also, I understand."

"I was third of the Theseus under Millar, sir."

"It nearly broke my heart to have missed it. I have not yet outlived it. To think of such a gallant service and I engaged in harassing the market boats, the miserable cabbage carriers of St. Luccars."

"Your plight was a better one than mine, Sir Cuthbert," said a voice from behind us, and a large man in the full uniform of a post Captain took a step forward to include himself in our circle. His mastiff face was heavy with emotion, and he shook his head miserably as he spoke.

"Yes, yes, Troubridge, I can understand and sympathize with your feelings."

"I passed through hell that night, Collingwood. It left a mark on me that I shall never lose until I go over the ship's side in a canvas cover. To have my beautiful Culloden laid on a sandbank just out of gunshot. To hear and see the fight the whole night through, and never to pull a lanyard or take the tompions out of my guns. Twice I opened my pistol case to blow out my brains, and it was but the thought that Nelson might have a use for me that held me back."

Collingwood shook the hand of the unfortunate Captain.

"Admiral Nelson was not long in finding a use for you, Troubridge," said he. "We have all heard of your siege of Capua, and how you ran up your ship's guns without trenches or parallels, and fired point blank through the embrasures."

The melancholy cleared away from the massive face of the big seaman, and his deep laughter filled the room.

"I'm not clever enough or slow enough for their Z Z fashions," said he. "We got alongside and slapped it in through their portholes until they struck their colors. But where have you been, Sir Cuthbert?"

"With my wife and my two little lassies at Morpeth, in the North country. I have but seen them once in ten years, and it may be ten more, for all I know, ere I see them again. I have been doing good work for the fleet up yonder."

"I had thought, sir, that it was inland," said my father.

Collingwood took a little black bag out of his pocket and shook it.

"Inland it is," said he, "and yet I have done good work for the fleet there. What do you suppose I hold in this bag?"

"Bullets," said Troubridge.

"Something that a sailor needs even more than that," answered the Admiral, and, turning it over, he tilted a pile of acorns onto his palm. "I carry them with me in my country walks, and where I see a fruitful nook I thrust one deep with the end of my cane. My oak trees may fight these rascals over the water when I am long forgotten. Do you know, Lieutenant, how many oaks go to make up an eighty-gun ship?"

My father shook his head.

"Two thousand, no less. For every two-decked ship that carries the white ensign there is a grove the less in England. So how are our grandsons to beat the French if we do not give them the trees with which to build their ships?" He replaced his bag in his pocket, and then passing his arm through Troubridge's they went through the door together.

"There's a man whose life might help you to trim your own course," said my father, as we took our seats at a vacant table. "He is ever the same quiet gentleman, with his thoughts busy for the comfort of his ship's company, and with his heart with his wife and children whom he has so seldom seen. It is said in the fleet that an oath has never passed his lips, Rodney, though how he managed when he was First Lieutenant of a raw crew is more than I can conceive. But they all love Cuddie, for they know he's an angel to fight. How d'ye do, Capt. Foley? My respects, Sir Ed'ard! Why, if they could but press the company they would man a corvette with flag officers.

"There's many a man here, Rodney," continued my father, as he glanced about him, "whose name may never find its way into any book save his own ship's log, but who in his own way has set as fine an example as any Admiral of them all. We know them and talk of them in the fleet, though they may never be bawled in the streets of London. There is as much seamanship and pluck in a good cutter action as in a line-o'-battle ship fight, though you may not come by a title or the thanks of Parliament for it. There's Hamilton, for example, the quiet, pale-faced man who is leaning against the pillar. It was he who with six rowing boats cut out the 44-gun frigate Hermione from under the muzzles of 200 shore guns in the harbor of Puerto Cabello. No finer action was done in the whole war. There's Brereton, with the whiskers. It was he who attacked twelve Spanish gunboats in his own little brig, and made four of them strike to him. There's Walker of the Rose cutter, who, with thirteen men, engaged three French privateers, with crews of 146. He sank one, captured one, and chased the third. How are you, Capt. Bell? I hope I see you well."

Two or three of my father's acquaintances, who had been sitting close by, drew up their chairs to us, and soon quite a circle had formed, all talking loudly and arguing upon sea matters, shaking their long red-tipped pipes at each other as they spoke. My father whispered in my ear that his neighbor was Capt. Foley, of the Goliath, who led the van at the Nile and that the tall, thin, foxy-haired man opposite was Lord Cochrane, the most dashing frigate Captain in the service. Even at Friars Oak we had heard how in the little Speedy, of fourteen small guns, with fifty-four men, he had carried by boarding the Spanish frigate Gamo, with her crew of 300. It was easy to see that he was a quick, irascible man, for he was talking hotly about his grievances, with a flash of anger upon his freckled cheeks.

"We shall never do any good upon the ocean until we have hanged a few dockyard contractors," he cried. "I'd have a dockyard contractor as a figurehead for every first-rate in the fleet, and a provision dealer for every frigate. I know them, with their puttied seams and their devil bolts, risking 500 lives that they may steal a few pounds' worth of copper. What became of the Chance, and of the Martin, and of the Orestes? They foundered at sea, and were never heard of more, and I say that the crews of them were murdered men."

Lord Cochrane seemed to be expressing the views of all of them, for a murmur of assent with a mutter of hearty deep-sea curses ran round the circle.

"Those rascals over yonder manage things better," said an old, one-eyed Captain, with the blue-and-white ribbon for St. Vincent peeping out of his third buttonhole. "They sheer away their heads if they get up to any foolery. Did ever a vessel come out of Toulon as my 38-gun frigate did from Plymouth last year, with her masts rolling about until her shrouds were like iron bars on one side and hanging in festoons upon the other. The meanest sloop that ever came out of France would have overmatched her, and then it would have been on me, and not on this Devonport bungler, that a court-martial would be called."

They loved to grumble, these old salts, for as soon as one had shot off his grievance, his neighbor would follow with another, each one more bitter than the last.

"Look at our sails," cried Capt. Foley. "Put a French and a British ship at anchor together and how can you tell which is which?"

"Frenchy has his fore and main topgallant masts about equal," said my father.

"In the old ships, maybe, but many of the new are laid down on the French model. No, there's no way of telling them at anchor. But let them hoist sail and how d'you tell them then?"

"Frenchy has white sails," cried several.

"And ours are black and rotten. That's the difference. No wonder they outsail us when the wind can blow right through our canvas."

"In the Speedy," said Cochrane, "the sailcloth was so thin that when I took my observation I always took my meridian through the foretopsail and my horizon through the foresail."

There was a general laugh at this, and then at it they all went again, letting off into speech all those weary broodings and silent troubles which had rankled during long years of service, and which an iron discipline prevented them from speaking of when their feet were upon their own quarter decks. One spoke of his powder, six pounds of which were needed to throw a ball a thousands yards. Another cursed the admiralty courts, where a prize goes in as a full-rigged ship and comes out as a schooner. The old Captain spoke of the promotions by parliamentary interest, which had put many a youngster into the Captain's cabin when he should have been in the gun room. And then they came back to the difficulty of finding crews for their vessels, and they all together raised up their voices and wailed.

"What's the use of building fresh ships," cried Foley, "when even with a £10 bounty you can't man the ships that you have got?"

But Lord Cochrane was on the other side in this question.

"You'd have the men if you treated them well when you'd got them," said he. "Admiral Nelson can get his ships manned. So can Admiral Collingwood. Why? Because he has thought for the men, and so the men have thought for him. Let men and officers know and respect each other, and there's no difficulty in keeping a ship's company. It's the infernal plan of turning a crew over from ship to ship and leaving the officers behind that rots the navy. But I've never found a difficulty, and I dare swear that if I hoist my pennant to-morrow I shall have all my old speedies back, and as many volunteers as I care to take."

"That is very well, my lord," said the old Captain, with some warmth. "When the jacks hear that the Speedy took fifty vessels in thirteen months they are sure to volunteer to serve with her commander. Every good cruiser can fill her complement quickly enough. But it is not the cruisers that fight the country's battles and blockade the enemy's ports. I say that all prize money should be divided equally among the whole fleet, and until you have such a rule the smartest men will always be found where they are of least service to any one but themselves."

This speech produced a chorus of protests from the cruiser officers and of hearty agreement from the line-of-battle-ship men, who seemed to be in the majority in the circle which had gathered round. From the flushed faces and angry glances it was clear to me that the question was one upon which there was strong feeling upon both sides.

"What the cruiser gets the cruiser earns," cried a frigate Captain.

"Do you mean to say, sir," said Capt. Foley, "that the duties of an officer upon a cruiser demand more care or professional ability than those of one who is employed upon blockade service with a lee coast under him whenever the wind shifts to the west, and the topmasts of an enemy's squadron forever in his sight?"

"I do not claim higher ability, sir."

"Then why should you claim higher pay? Can you deny that a seaman before the mast makes more in a fast frigate than a Lieutenant can in a battle ship?"

"It was only last year," said a very gentlemanly looking officer, who might have passed for a buck about town, had his skin not been burnt to copper in such sunshine as never bursts upon London. "It was only last year that I brought the old Alexander back from the Mediterranean floating like an empty barrel and carrying nothing but honor for her cargo. In the channel we fell in with the frigate Minerva, from the western ocean, with her lee ports under water and her hatches bursting with the plunder which had been too valuable to trust to the prize crews. She had ingots of silver along her yards and bowsprit, and a bit of silver plate at the trucks of the masts. My jacks could have fired into her and would, too, if they had not been held back. It made them mad to think of all they had done in the South, and then to see this saucy frigate flashing her money before their eyes."

"I cannot see their grievance, Capt. Bell," said Cochrane.

"When you are promoted to a two-decker, my lord, it will possibly become clearer to you."

"You speak as if a cruiser had nothing to do but take prizes. If that is your view, you will permit me to say that you know very little of the matter. I have handled a sloop, a corvette, and a frigate, and I have found a great variety of duties in each of them. I have had to avoid the enemy's battleships and to fight his cruisers. I have had to chase and capture his privateers and to cut them out when they ran under his batteries. I have had to engage his forts, to take my men ashore, and to destroy his guns and his signal stations. All this, with convoying, reconnoitering, and risking one's own ship in order to gain a knowledge of the enemy's movements, comes under the duties of a commander of a cruiser. I make bold to say that the man who can carry these objects out with success has deserved better of the country than the officer of a battleship tacking from Ushant to the Black Rocks and back again until until she builds up a reef with her beef bones."

"Sir," said the angry old sailor, "such an officer is at least in no danger of being mistaken for privateersman."

"I am surprised, Capt. Bulkeley," Cochrane retorted angrily, "that you should venture to couple the names of privateersman and King's officer."

There was mischief brewing between these hot-headed, short-spoken salts, but Capt. Foley changed the subject to discuss the new ships which were being built in the French ports. It was of interest to me to hear these men who were spending their lives in fighting against our neighbors discussing their character and ways. You cannot conceive—you who live in times of peace and charity—how fierce the hatred was in England at that time against the French, and above all against their great leader. It was more than a mere prejudice or dislike. It was a deep aggressive loathing which you may even now form some conception of if you examine the papers or caricatures of the day. The word Frenchman was hardly spoken without "rascal" or "scoundrel" slipping in before it. In all ranks of life and in every part of the country the feeling was the same. Even the jacks aboard our ships fought with a viciousness against a French vessel which they would never show to Dane, Dutchman, or Spaniard.

If you ask me now, after fifty years, why it was that there should have been this virulent feeling against them, so foreign to the easy-going and tolerant British nature, I would confess that I think the real reason was fear. Not fear of them individually, of course—our foulest detractors have never called us faint hearted—but fear of their star, fear of their future, fear of the subtle brain, whose plans always seemed to go aright, and of the heavy hand which had struck nation after nation to the ground. We were but a small country, with a population which, when the war began, was not much more than half that of France. And then France had increased by leaps and bounds, reaching out to the north into Belgium and Holland, and to the south into Italy, while we were weakened by deep-lying disaffection among both Catholics and Presbyterians in Ireland. The danger was imminent and plain to the least thoughtful. One could not walk the Kent coast without seeing the beacons heaped up to tell the country of the enemy's landing, and if the sun were shining on the uplands near Boulogne, one might catch a glimpse of its gleam upon the bayonets of manœuvering veterans. No wonder that a fear of the French power lay deeply in the hearts of the most gallant men, and that fear should, as it always does, beget a bitter and rancorous hatred.

The seamen did not speak kindly of their recent enemies. Their hearts loathed them, and, in the fashion of their country, their lips said what their hearts felt. Of the French officers they could not have spoken with more chivalry as of worthy foemen, but the nation was an abomination to them. The older men had fought against them in the American war, they had fought again for the last ten years, and the dearest wish of their hearts seemed to be that they might be called upon to do the same for the remainder of their days. Yet if I were surprised by the virulence of their animosity against the French, I was even more so to hear how highly they rated them as antagonists. The long succession of British victories, which had finally made the French take to their ports and resign the struggle in despair, had given all of us the idea that for some reason a Briton on the water must, in the nature of things, always have the best of it against a Frenchman.

But these men who had done the fighting did not think so. They were loud in their praise of their foeman's gallantry, and praise in their reasons for his defeat. They showed how the officers of the old French navy had nearly all been aristocrats. How the revolution had swept them out of their ships and the force been left with insubordinate seamen and no competent leaders. This ill-directed fleet had been hustled into port by the pressure of the well-manned and well-commanded British, who had pinned them there ever since so that they had never had an opportunity of learning seamanship. Their harbor drill and their harbor gunnery had been of no service when sails had to be trimmed and broadsides fixed on the heave of an Atlantic swell. Let one of their frigates get to sea and have a couple of years free run in which to learn their duties, and then it would be a feather in the cap of a British officer if, with a ship of equal force, he could bring down her colors.

Such were the views of these experienced officers, fortified by many reminiscences and examples of French gallantry, such as the way in which the crew of the L'Orient had fought her quarter-deck guns when the main deck was in a blaze beneath them and when they must have known that they were standing over an exploding magazine. The general hope was that the West Indian expedition since the peace, might have given many of their fleet an ocean training, and that they might be tempted out into mid-channel if the war were to break out afresh. But would it break out afresh? We had spent gigantic sums and made enormous exertions to curb the power of Napoleon and to prevent him from becoming the universal despot of Europe. Would the Government try it again? Or were they appalled by the gigantic load of debt which must bend the backs of many generations unborn? Pitt was there, and surely he was not a man to leave his work half done.

And then suddenly there was a bustle at the door. Amid the gray swirl of the tobacco smoke I could catch a glimpse of a blue coat and gold epaulets, with a crowd gathering thickly around them, while a hoarse murmur arose from the group, which thickened into a deep-chested cheer. All were on their feet, peering and asking each other what it might mean. And still the crowd seethed and the cheering swelled.

"What is it? What has happened?" cried a score of voices.

"Put him up! Hoist him up!" shouted somebody, and an instant later I saw Capt. Troubridge appear above the shoulders of the crowd. His face was flushed, and he was waving what seemed to be a letter in the air. The cheering died away, and there was such a hush that I could hear the crackle of the paper in his hand.

"Great news, gentlemen!" he roared. "Glorious news! Rear Admiral Collingwood has directed me to communicate it to you. The French Ambassador has received his papers to-night. Every ship on the list is to go into commission. Admiral Cornwallis is ordered out of Cawsand Bay, to cruise off Ushant. A squadron is starting for the North Sea and another for the Irish Channel."

He may have had more to say, but his audience could wait no longer. How they shouted and stamped and raved in their delight! Harsh old flag officers, grave post Captains, young Lieutenants, all were roaring like school boys breaking up for the holidays. There was no thought now of those manifold and weary grievances to which I had listened. The foul weather was passed, and the land-locked seabirds would be out on the foam once more. The rhythm of "God Save the King" swelled through the babel, and I heard the old lines sung in a way that made you forget their bad rhymes and their bald sentiments. I trust that you will never hear them so sung, with tears upon rugged cheeks, and catchings of the breath from strong men. Dark days will have come again before you hear such a song or see such a sight as that. Let those talk of the phlegm of our countrymen who have never seen them when the lava crust of restraint is broken, and when for an instant the strong endurance fires of the north glow upon the surface. I saw them then, and if I do not see them now I am not so old or so foolish as to doubt that they are there.

To Be Continued.

At the Wrong Nuptials.

From the Chicago Daily Tribune.

"If any man can show just cause why these two persons may not be lawfully joined together let him now speak or else hereafter forever hold his peace."

Slowly and impressively the officiating clergyman spoke these words.

The solemn pause that followed their utterance was broken by a deep, strong voice from the rear of the church:

"May I ask you, sir, to repeat the names of those two persons who stand before you as candidates for matrimony?"

"George Washington Spoonamore and Jophenia Shaw," answered the clergyman, astonished at the interruption.

"Go ahead with the marrying," rejoined the owner of the deep voice, clapping on his hat and starting for the door. "It's all right. I had just got here, and hadn't heard the names. The wedding I'm trying to stop must be in the church a block and a half below here."

JAPAN'S COTTON MILLS.

COMPETITION WHICH THREATENS ENGLAND'S ASIATIC TRADE.

Women Working Ten Hours or More a Day for Five Cents and Seven Days a Week—Men's Wages Little Higher—The Hands Happy and Healthy—Rapid and Steady Growth of the Industry.

TOKIO, Japan, May 13.—I found Mr. T. Wada, manager of the Kanegafuchi Spinning Company, a most agreeable and intelligent man, and thoroughly conversant with the English language. He believes firmly that the future centre of cotton manufacture will be in China and Japan, and, as evidence of that belief, the capitalists he represents are building a branch mill in Japan, and also a mill of 40,000 spindles at Shanghai. These mills will be fully equipped with the most modern European and American machinery, and conducted on the lines of the Tokio mill.

"By the end of this year," said Mr. Wada, "we shall have a capacity of 1,500,000 cotton spindles here in Japan."

"That will more than supply your wants at home?"

"Undoubtedly; but it is our intention to supply the wants of the 400,000,000 people across the Sea of Japan. Why should this vast Asiatic population be supplied from Manchester at a greatly enhanced cost, when we have abundance of cheap and competent labor both in China and Japan? The Japanese will naturally secure all of this trade that our new conditions and new methods will permit."

The Tokio spinning mill is a large brick structure, in appearance much the same as our own mills, excepting that it has an enormous iron smokestack. Such smokestacks are more popular in Japan because of the frequent earthquakes. These disturbances would be quite sufficient to shake down brick stacks, and for a similar reason the spinning operations are all conducted on the ground floor. Consequently the buildings are spread over a large area. In addition to the mill itself, there is within the enclosure a great variety of other buildings, owned by the proprietors of the mill and used for purposes in connection with it. Above 1,500 of the women and girls employed live on the premises. There is also a schoolhouse, where the younger operatives are taught to read and write, and where the older ones are instructed in the use of our numerals and some technical matters connected with the mill.

I find that the Japanese are beginning to manufacture finer yarns, and have machinery to make as high as No. 70, and also gassed threads. It will be possible to learn more about this in Osaka. The Tokio mill was working on yarn below No. 40. The import tables for 1895 show a great decrease in importations of yarns below No. 32, those ranging from 38 to 42 a slight decrease, while threads rated at 42, 60, and 80 have been imported in increased quantities. They make at this mill as high as 42, so it is the intention of the Japanese to increase the fineness of their yarns as soon as the demand for the coarser yarns is fully supplied. The following table shows the cotton thread imported into Japan from England and India, very little coming from other countries:

Year.	England. Kin.	India. Kin.	Other Countries. Kin.
1890.			
Amount	17,911,109	13,970,023	....
Price	$6,374,283	$3,542,329	....
1891.			
Amount	12,787,408	4,548,045	2,138
Price	$4,453,112	$1,135,459	$719
1892.			
Amount	10,048,337	8,258,369	1,785
Price	$5,316,682	$1,814,394	$904
1893.			
Amount	14,527,812	4,865,040	12,300
Price	$6,033,005	$1,243,163	$8,975
1894.			
Amount	13,606,179	2,333,625	3,000
Price	$7,288,690	$687,556	$1,210
1895.			
Amount	13,247,316	1,341,691	2,076
Price	$6,688,066	$392,631	$2,277

NOTE.—Kin is 1⅓ pounds avoirdupois or 1⅔ pounds troy.

It will be seen that while the decrease from England has not been so large, the imports from British India have almost been wiped out. The following table shows the increase of importation of raw cotton into Japan and the decrease of the importation of yarn since 1888:

YEAR.	Importation of Raw Cotton. Kin.	Value in Silver Dollars.	Importation of Cotton Yarn. Kin.	Value in Silver Dollars.
1888	11,893,267	$1,652,243	47,439,639	$13,611,898
1889	23,168,094	3,464,326	42,810,912	12,522,030
1890	28,084,345	4,134,790	31,908,362	9,928,061
1891	50,128,750	6,999,533	17,837,600	5,559,259
1892	78,617,573	11,026,637	24,308,491	7,131,979
1893	93,835,718	15,294,897	19,405,152	7,284,245
1894	108,115,690	19,103,722	15,942,797	7,077,589
1895	143,468,259	24,304,812	14,591,083	7,082,975

The above figures simply bear out the statement that Japan has practically secured her home market for the coarser yarns, and that British India has thus far been the sufferer. The next move on the part of the Japanese manufacturer will be to secure the entire home market for the finer grades of yarn. If successful, the value of imports will continue to decrease. For the moment they are stationary, owing to the demands for finer grade yarns. Before proceeding with a description of the spinning mill, it may be interesting to know just where Japan purchases her cotton and the price paid for it. I only submit the facts for 1895, for want of space:

IMPORTS OF RAW COTTON INTO JAPAN, 1895.

	Kin.	Value in Silver Dollars.
From British India	46,683,887	$5,693,224
From China	82,171,626	13,786,101
From French India	2,801,338	406,816
From Siam	61,718	9,187
From United States	11,996,115	2,318,177
From other countries	253,575	77,307
Totals	143,468,259	$24,304,812

The importation of cotton from the United States is increasing, and is double what it was in 1893. Nevertheless, Mr. Wada informed me that Japan needs our cotton in much larger quantities. Moreover they need it direct. Japan will soon establish a line of steamships to New York and Philadelphia, and possibly from San Diego. They are tired of buying our cotton at Liverpool, not only because of the enormous freight charges, but also because it gets here in bad condition. I saw nearly 1,000 bales of American cotton in the warehouses of this mill, and the same quantity of Bombay cotton. The former was in bad condition, burlaps broken, cotton full of sand and dirty, only eight or nine cotton ties around a bale. The Bombay cotton was very different. It was tightly done up, with thirteen or fourteen cotton ties, not quite so wide as ours, but the greater number makes much better packages. I did not see a tear in any package. In fact, you could not judge the contents from outside appearance. Our only hope of sharing the prosperity of Japan in the cotton trade is in furnishing the raw material. Those interested should at once join the Japanese in some cheap way of shipping cotton without the tremendous rail journey across the continent. The manufacturer here is anxious for American cotton. He must have it to make the next important step in his business. Surely these two interests can devise some plan for mutual benefit.

The wages paid in Tokio to cotton spinners are the highest in the empire. The average for men in this district is as high as 23 sen a day, or at the present rate of exchange, say, 13 cents a day; for women, 11.8 sen, or, say, 6½ cents American money a day. In some cotton mills the pay is as low as 8 cents for men and less than 5 cents a day for women. In Osaka it ranges from 17 sen a day for men to 9.9 sen for women, say, nine and five cents respectively. Now, while this labor seems to us very low when given in gold, it must be considered in connection with what it will purchase here. To begin with, in all that these operatives require it will buy precisely as much as the same number of cents on a gold basis purchase in the United States, if not more. Another important factor is that the wants of these people are very different to the wants of an American or European population.

Let us deal with the women first, because there are 2,654 as against 628 men engaged in cotton spinning in Tokio, principally in the mill under consideration. They dress in a dark heavy cotton gown, with tight sleeves, but folded over the breast, Japanese fashion. The kimona is abolished in large manufacturing establishments. This seems to be their only garment when at work. On their naked feet are straw and hemp sandals, which cost about half a cent a pair, which really last a long time. For outside wear they have a pair of white cotton shoes, made glove fashion, so the big toe is free, and in this way they hold their wooden out-door clogs or *geta* on the feet. These girls dress their hair in both European and Japanese fashion. They look rosy and plump, and apparently contented with their lot. They are certainly quite as well off as those of their sex toiling from morn to eve in the little shops. Their burden is not more irksome than that of those who carry fat babies around all day on their backs and perform many domestic duties. It is not therefore with the misery of the lot of these girls that we have to treat, but with the economic fact that millions of these docile, contented, healthy women exist here in Japan, and that they are susceptible to the highest degree of organization. That is the fact I propose to deal with. When compared with our own girls in similar employment, they excite no greater degree of pity. I am not sure but that they excite less. And for this reason. These Japanese girls are apparently not susceptible to the emotions or sensations of the American girl doomed to a life of drudgery. They are not chafing and fretting over their lot, but light-hearted and contented to be part of the machinery of the mill.

That is all they are. Each girl when she enters the gates of the great establishment renounces the outside world for the period of her contract as effectually as if she entered the Tokio Yoshiwara. She binds herself to her master for three years and gives him eleven and one-half hours' time each day. During this time an hour is allowed for dinner, and a brief intermission about 10:30 A. M. and again in the afternoon. They put in about ten solid hours of work a day. The mill works day and night and Sundays. The night force this week is the day force next week. As nearly all the girls live within the walls of the mill, they arise, get their meals, and proceed with military precision. How do they live? Principally upon rice, vegetables, and fish. The food is well cooked and served in bowls on long pine tables. Here a Japanese custom, that of sitting on the floor, must be abolished to meet the exigencies of modern manufacturing. The school rooms, dining rooms, and sitting rooms are all on the European plan. Not so with the sleeping apartments. Here the Japanese mats are most convenient, and several hundred girls sleep on the floor. The luxury of night gowns and bedsteads and sheets and blankets is, of course, unknown. They simply lie down in their simple garment, or gown, cover themselves over with a quilt, adjust their pillow of wood, and go to sleep. You may pass through the rooms any day, with a hundred or two sleeping maidens, and none of them would be likely to scream or pay any attention to you. Such a life is monotonous, and it would be unbearable to European races, but the Japanese seem comfortable and contented.

The hours, however, are too long, and seven days' work, aside from the religious view of it, is mistaken economy. If Japan expects to become a great manufacturing nation, the Government must reduce the hours of labor and work only six days a week. This subject of long hours will be discussed in connection with the silk industry. There I found the operatives working from 5:30 in the morning until 9:30 at night. Besides the inhumanity of it, they are killing the goose that lays the golden eggs. This system checks the growth of the children, and in the end will destroy the stamina of the people. The shrewd managers of the Tokio Spinning Mill understand this, and while their hours are long, they are not as long as at the mills in Osaka.

I have just received from the Osaka Sanitary Society some useful information in regard to the hours of labor of Osaka artisans and factory girls. The society's researches have been carried on since the fall of the year before last, and include all the spinning factories in Osaka, where 6,207 male and 16,785 female operatives are employed, as well as the working hours of other mechanics. The hours of labor in the spinning mills are tabulated as follows:

Age.	Number of operatives.	Average number of hours. HRS.	MIN.
Above 60	56	11	7
Above 20	7,385	11	15
Above 15	5,743	11	0
Above 12	2,518	11	0
Above 10	571	11	10
Below 10	171	11	15

Eleven hours of work for children of ten years and under cannot fail seriously to arrest their growth and impair their health. In match factories it was found that the average working hours of persons above sixty are ten hours and forty minutes, while persons below that age work eleven ours and forty five minutes. The sanitary authorities are said to be much exercised at this excessive duration of the working day, and especially at finding children subjected to such continuous overwork.

In the silk region there are no sanitary authorities, and the employers do as they please. Some are humane, and others work little girls and young women twelve to fourteen hours a day without a thought of the consequences.

The pay of the girls ranges from 5 to 15 sen a day. The beginners about make their board. The experienced operatives are charged 3 sen a day for their food. All else is furnished, including a good, large bath, which is used frequently. The girls are allowed to take baths at any time. The men make from 15 to 30 sen a day. They are dressed in red woollen shirts with white, close-fitting cotton trousers. They look clean and healthy, and work with great dexterity and rapidity. This is equally true of the women. I see no reason why they should not be as expert and quick as any cotton spinners in the world. They are perfectly organized, the machinery is good and up to date, the mill admirably arranged, the rooms well ventilated. The hands receive sufficient food, such as it is. They appear to relish it. They all have the comforts which the average Japanese demands for sleeping. To my mind they are far better off than the dwellers in the wooden boxes and black-painted mud safety vaults which answer for houses in the alleys and crooked byways of Tokio. They have fresh country air in every direction, as the mill is outside the city and surrounded by rice and barley fields. Unlike the Germans, the Japanese do not dance. Dancing is a special profession with them. They do not go to the theatre. Festivals during certain seasons are the principal form of Japanese amusement. In the observance of these festivals the girls of the cotton mill take part, and seem to enjoy themselves greatly. Such celebrations are encouraged by the proprietors.

Two days were given up to one of these festivities, which came last Sunday and Monday. It was the eighth anniversary of the starting of the mill. The proprietors gave a garden party to over 3,000 hands and their friends. Each operative was presented with a Japanese dinner for two. A large field near the mill was used to assemble the crowd of from five to six thousand people. The girls were all neatly dressed in dark blue cotton gowns. Some indulged in European hats and even finery. Others had their hair dressed Japanese style and filled with cherry blossom pins. There were three bands, one composed of Japanese girls, who played very well. A triumphal arch had been built, and under it, with bands playing and banners flying, marched the army of operatives. Besides amateurs, there were professional actors, who performed in the large dining room, and other performers on temporary platforms in the open air. There were all sorts of patriotic dances, some by the girls, and others by geisha girls, especially employed. It was really surprising to see the excellent dancers among these girls. There were fencing, wrestling, the game of top, requiring much skill, and a variety of fun and rollicking. In all this the proprietors took an active part. They waited on their numerous guests, gave all the girls a cherry blossom pin to decorate the hair, and helped to distribute the boxes of sweetmeats and Japanese food. The mill is making a good dividend, and they give these entertainments to show their appreciation of the operatives. This is the theory. The hands had a happy time, and the mill has closed up for two days.

The lives of this class of operatives, though usually, I have no doubt, monotonous enough, have some rays of sunshine. It speaks well for the Japanese, whose laws and conditions make it quite possible to practically enslave these poor workers, that they should recognize the necessity of occasional recreation and days of rest. In time, I suppose, Japan, too, will have factory laws and eight-hour agitation. For the moment, the hours are from daylight to dark; all ages, both sexes, all taking a hand in the struggle for existence.

The most important and interesting question out here just now in connection with cotton manufacturing is that relating to the relative merits of Japan and Shanghai as cotton manufacturing centres. The British Consul, in a report sent home a few days ago, but printed here first, intimated that hereafter Shanghai would have the advantage both in raw cotton near at hand and "an even more abundant supply of labor at least as cheap as the cheapest in Japan, inferior to the latter in intelligence, perhaps, but superior in strength, docility, faith in observing agreements, and perhaps in endurance." There may be a point in the raw cotton near at hand, but in point of labor it is hardly possible to imagine cheaper labor than that which I have described in this the highest salaried cotton mill in Japan. It has never been shown that labor is cheaper in China than in Japan. The life of a coolie is much the same in both countries. As to "docility" and "faith in observing agreements," there has been one, and only one, conspicuous opportunity of judging, namely, on the sugar plantations of Hawaii. It was precisely because Chinese laborers were found lacking in "docility" and "faith in observing agreements" that the Hawaiian planters turned to Japan for substitutes, and against those substitutes, after several years' experience, no complaint has ever been preferred on either score. In my belief, in no country can more faithful and docile labor be found than in Japan. Of course the Japanese newspapers took issue with the British Consul, and, as a result, I have secured some important information in relation to the relative cost of producing yarn in Shanghai and Japan. I have had translated and condensed from the *Jiji Shimpo*, the most trustworthy Japanese newspaper on all matters relating to industry and trade, some interesting facts. This paper published last week an article eulogizing the action taken by the Japanese Diet in abolishing the import duties on raw cotton. This step must prove of immense benefit to the spinning industry in Japan, and will impart a powerful impetus to the export of Japanese yarns.

The paper published in support of its contentions a table showing that Bombay yarns, as laid down in Shanghai, used to undersell Japanese by $0.353 silver per bale of twenty hanks. The late import duties on raw cotton were $9.300 (silver) per 100 piculs, and supposing that 350 piculs were needed in producing one bale of yarn of a given size, Japanese spinners will now be able to place their goods on the Shanghai market at $1.30 (silver) a bale cheaper than before. In other words, whereas their goods were formerly dearer than Bombay by $0.353 (silver) a bale, they can hereafter undersell Bombay by as much as $1.047 (silver) a bale.

Already the benefit of the abolition of the impost has been illustrated significantly. Transactions in yarns for Chinese export are now so active that the Kanegafuchi spinning factory, which I have just described, has its output of export yarns till May entirely taken up. Many spinning factories at Osaka have also secured big orders. Usually the three or four months beginning from May are the most inactive of the year, but it is confidently expected this year that these months will be quite as brisk as other portions of the year, if not more so. Owing to this unusual activity in the spinning factories, and also owing to the very satisfactory cotton crop in India last year, the import of cotton from Bombay is unusually large this season. Some 40,000 bales, costing about $2,000,000, have been imported, while three or four steamers laden with cotton are expected this month.

These facts are all of interest to American and English cotton manufacturers, for they indicate the tremendous efforts these capable, thrifty, and industrious people are putting forth, not only to receive all their home trade, now in the hands of foreigners, but to stretch out for as much as possible of the Asiatic trade, which lies at the basis of England's riches and prosperity. It is a struggle, not of nations, but of continents.

ROBERT P. PORTER.

BOUCHER, THE FRENCH SCULPTOR.

A Very Conspicuous Artist—His Life and Work.

PARIS, May 27.—Paris, like Rome, has its seven hills: Mont Valérien, Monteceau, Montmartre, Mont Parnasse, Montrouge, Montsouris, and the Mountain of St. Géneviève. Mont Valérien, outside of the walls, represents war; Montrouge and Montsouris stand for business; Monteceau, for luxury and pleasure; Mount St. Géneviève, for youth and study; Montmartre and Mont Parnasse are like the two artistic sources of life in the City of Light—for on them especially are settled the artists, the painters, and sculptors.

Up on Mont Parnasse, off the Rue de Vaugirard, lies Rousin court, which is really a little square. The passer can't help seeing that he is in the domains of the stonecutters and statuaries; blocks of marble of all sizes are leaned against the walls of the buildings, and marble dust and chips are everywhere. At the end of the square, however, is a dainty little house, whose unduly large veranda is a museum of sculpture. That is the home of Alfred Boucher, grand master of French sculpture; a man not very well known in America as yet, who, however, is competing for the statue to Jefferson Davis to be erected in Richmond.

Boucher was born at Nogaret, a town on the Seine, in 1850. His face shows his character. Framed in a bushy beard and black hair, it is mild, almost melancholy; his eyes, however, have a singularly energetic glance. His face indicates his artistic temperament, his gracious sweetness, and his robust energy. He grew up among the peasantry and began life a laborer, a country lad among country lads. The story is that he moulded clay between his hard hands, instinctively, naturally. This may be true; but legends grow easily after success has crowned the work. However that may be, from his childhood in the country he has gained a sort of timid shyness, with a fund of energy and obstinacy which form the basis of his temperament. Indecision and a certain graceful awkwardness are apparent only in his motions. Boucher is, first and foremost, a man with a will; the strong sap of the country peasant ferments in him, and helps his talent to express itself. Of this his career is a proof.

Distinguished by Ramus, Boucher began his first lessons as a sculptor under that old master. For four years, from 16 to 20, this was his work: On rainy days he modelled in clay; on clear, days he worked in the fields to support himself. Finally Paul Dubois, like Boucher a native of Nogaret, saw his studies, became interested in the young man, obtained for him a pension from the Department of the Aube, and took him into his own studio in the School of Fine Arts in Paris.

In 1874 Boucher gained place in the Salon by his first victory; his "Child at the Fountain," a graceful and well-conceived figure, brought him a third prize. In 1875 and 1877 he tried for the great "Prix de Rome," the winner of which is sent to Rome to study. In both years the sculpture section of the Academy of Fine Arts ranked him first unanimously; but each time the judgment of the sculptors was modified by the musicians, the literary men, the engravers, and the painters, who through some illogical rule are called in to advise on granting the "Roman scholarship." In the same way the painters, sculptors, musicians, and engravers pass on the architectural drawings submitted, even though they may not be able to make out a plan.

Boucher, though he did not get the Roman scholarship, received the highest second prize, and went to Rome, where he studied earnestly, yielding himself more willingly to the poetic vigor of Michael Angelo than to the intoxication of the Florentine school. On his return to Paris in 1878 he won a second-class medal with his "Eve" (in plaster), dreamy and caressing, which, however, marks a pause, or, perhaps, rather a moment, of research, in the development of his work.

Boucher looks around him, studies, thinks; he seeks in himself his voice, his views, produces little for a time, then when he has worked out his idea in his mind he goes straight forward, without hesitation or feebleness, to success and honors. In 1881 he won the Salon prize with his "Filial Love," a subject which belongs to every one, which is historical, which, however, he has made his own by the sincerity and the austerity with which he has worked it out. The subject is that of the daughter suckling her aged father. The contrast of the two figures is rendered with great effect. One feeble, emaciated, made almost imbecile by privation; the daughter simple, lovely, and wholesome, in whom goodness of heart is a second nature. In 1886 Boucher won the first medal with his group, "At the Goal," more commonly called "The Runners." It attracted much attention at the Exhibition of 1889, and was bought by the Government and placed in the Luxembourg Gardens.

This group, best of all his work, shows Boucher's vigorous execution and calm audacity. It represents three men nearing the goal in a running race. They are straining heart and muscles in a furious rush, an empty stretching of the arms, a muscular spring with the whole body; one of them is a little behind the others, his hand higher than theirs; the others are on equal terms. Without violence or confusion they seem to move with furious yet harmonious action. The group has been criticised as having the three faces too much alike; but runners do not carry their characters in their faces.

"Some artists," a critic has remarked, "forget too easily that sculpture is essentially a decorative and monumental art, and that there is always danger lest talent shall confound it with parlor ornaments. Every sculptor who does not see his work set off properly in full light has no great work in him." Such a sculptor may carve a dainty Diana, such as Falguière carves, or a dancer, queer but passable, like this year's Cléo de Mérode. It will be only a pretty thing for the parlor; and however ravishing it may be, with all the skilful handiwork that it may have, it will remain only a shivering statuette to be admired in the half light among the heavy and perfumed hangings of a drawing room. Sculpture, in its best sense, is more audacious and more natural; it needs light, and a worthy setting. It is Boucher's greatest merit that he impresses on all his works his own greatness of character, so that they seem always the result of an ideal and superb inspiration.

Made a chevalier of the Legion of Honor in 1887, Boucher won the medal of honor at the Salon of 1891 with his "The Earth," which is undoubtedly one of the most powerful productions of modern French sculpture. In it he revived his youth, and poured out his love for the earth and the soil. It shows a naked man digging in the ground. The subject is simple; but in the execution there is such strength, such severity! The effect of action is overpowering; the observer is moved exceedingly.

In 1894 Boucher was made officer of the Legion of Honor, and was chosen by his compatriot, Casimir Perier, President of the republic, to make his official portrait bust. Boucher is known already in America by his "Piety" in the cathedral of Philadelphia, and by three Christs which he executed for one of the Drexels.

M. D.

OFF FOR JAPAN TO SEE THE ECLIPSE

The Lick Observatory Expedition Sailed On May 28 for Yezo.

From the San Francisco Examiner.

The steamer Belgic, which sails for China and Japan this afternoon, will carry the Lick Observatory eclipse expedition. Prof. J. M. Schaeberle, senior astronomer at the Lick, is in charge of the party, and Mr. Charles Burckhalter, astronomer of the Chabot Observatory in Oakland, is first assistant. With them will go two volunteers, Mr. Lewis C. Masten of San Francisco and Dr. A. G. Shuey of Oakland.

All the members of this party belong to the Astronomers' Society of the Pacific, and all those who contributed toward the expenses of the expedition are also members of the same society. Mr. Charles F. Crocker placed at the disposal of the Lick Observatory a sum sufficient to defray all the travelling expenses.

Prof. Schaeberle has twice before gone on long eclipse voyages in the name of the Lick Observatory. In 1889 he went with Prof. S. W. Burnham to Cayenne, in French Guiana, and succeeded in making some excellent photographs in a partly cloudy sky. In 1893 Prof. Schaeberle went entirely alone on an eclipse voyage to Chili. He carried with him an immense photographic telescope and set it up on the summit of the Andes, making all observations and computations for time, latitude and longitude, unaided, and picking up only untrained volunteer assistance for the work during totality. The Lick astronomer has been in this city for a week past, seeing that his apparatus was being properly shipped. He will carry to Japan the same camera that he used so successfully in Chili. Charles Burckhalter is a local astronomer of more than local renown. He has been in charge of the Chabot Observatory for nearly ten years.

Some point inland from Kushiro, on the island of Yezo, will be the station selected by Prof. Schaeberle's party. The exact location will not be decided upon until Japan is reached. They hope to transport all the apparatus to some mountain elevation if this is found practicable. While the chances of clear weather in northern Japan during August are only reckoned at 20 per cent., Prof. Schaeberle believes he will stand a somewhat better chance at an elevation inland than if he remained near the fog-laden coast.

Kalamazoo, Mich., is famous for celery. See Thomas Slater's offer on page 4, main sheet.—*Adv.*

PROF. LANGLEY'S AIR SHIP.

HAS HE SOLVED THE PROBLEM OF AERIAL NAVIGATION?

His Success Vouched For by Alexander Graham Bell—Details of the Machine Yet a Secret—Some Account of the Distinguished Inventor and His Work.

From the St. Louis Globe-Democrat.

It is rather surprising that the announcement that Prof. S. P. Langley of the Smithsonian Institution had definitely solved the problem of aerial navigation has not attracted more attention than it has. Coming from such a man, and backed by the word of so practical a man of science as Alexander Graham Bell, it was not such an announcement as might have come from some unknown inventor.

Prof. Langley would die a famous man if he had never taken up aero-dynamics or attempted to build a flying machine. He is indeed, in his chosen field of astronomy, the foremost man of science we have in this country. Prof. Langley ranks with the greatest astronomers and physicists of the world, and he is one of the few men whom America has produced so far who have made any real and solid contributions to pure science. He is to the latter something of what Tesla is to applied science.

It was a really remarkable thing that a man like Prof. Langley should have undertaken to build a flying machine at all. It was still more remarkable at his age. Although he bears them lightly, he has now 62 years to his credit, and he did not take up with his investigations as to aerial flight until about six or seven years ago. But he has prosecuted his inquiry with all the enthusiasm of a young man, and is, in short, one of the type whom you are led to describe as 62 years young.

Again, in both its matter and manner, Prof. Langley's invention, or his discovery, whichever you may like to term it, is of unique interest. His machine is built upon exactly the opposite principle from that upon which other flying machines have been built, and his invention represents a clear triumph for pure inductive science.

When Stephenson built his locomotive he proceeded in his work upon certain definitely known facts—that is, he was perfectly sure that if he could find a way to push his wheels around by steam his engine would run over the ground just as an ordinary wagon would. He was venturing into no unknown field of physics. With Prof. Langley it was just the opposite. Although men of science for two centuries or more have been studying the dynamics of the air, have weighed it, and determined its compressibility, its action under heat, &c., yet up to the time Prof. Langley took hold of the matter there existed no definite data as to the plan or principle upon which a flying machine, if it is to successfully navigate the air, must be built. To find out these new data was his first work.

Put in a less technical way, Prof. Langley's problem was this: He says, "Did you ever think what a physical miracle it is for such a bird as one of our common turkey buzzards to fly in the way it does? You may see them any day along the Potomac, floating in the air, with hardly the movement of their feathers. These birds weigh from five to ten pounds; they are far heavier than the air they displace; they are absolutely heavier than so many flatirons.

"I fancy if you saw cannon balls floating through the air like soap bubbles you would look upon it as a sufficiently surprising matter, if not as a miracle. The only reason that we are not surprised at the soaring bird is that we have seen it from childhood. Perhaps if we had seen cannon balls floating in the air from our childhood we would not stop to inquire how they did it, any more than we now do how the turkey buzzard does it. I am speaking now, of course, not of birds that fly by flapping their wings, but of those that fly without flapping their wings, and with almost no visible expenditure of force."

It was from watching the turkey buzzard that Prof. Langley came to conclude that it was possible to build solid models very much heavier than the air and drive and direct such a machine with such an ordinary force as steam. That is to say, he became convinced that there are certain shapes in which matter can be disposed so that the more rapidly it moves through the air, in a sense, the less power it takes to move it, and that a machine could be built to skim through the air very much as a skater skims along the surface of very thin ice—the faster you go, the less danger.

Prof. Langley believed that soaring birds have an intuitive knowledge of certain properties in the air by which they are able to skim along—rising and falling, soaring up and sailing down, and turning about in circles without any flapping of their wings or apparently any other effort. Just what these properties were he attempted to find out and develop by experiment. In this work he was associated with his friend, Graham Bell, or, at any rate, Prof. Bell spent a great deal of time over the same subject, and has a mass of notebooks filled with records of his experiments.

The upshot of the matter was that from these experiments it was demonstrated that a machine, not a balloon, can be made which will produce enough mechanical power to support itself in the air and fly. "Though," Prof. Langley adds, "this is not saying that we have yet got skill enough to manage this power so as to rise and fly about in the air and descend safely." What is actually demonstrated, repeated hundreds of times in the laboratory, and finally with the successful machine which Prof. Langley built, is that the flying machine is possible. All that now remains is to perfect it and learn how to manage it.

The experiments which Prof. Langley carried on resulted in showing that an expenditure of one horse-power, in horizontal flight, will support about 200 pounds, and at the same time carry this burden at a rate of fifty miles an hour through the air. Now, there have recently been built steam engines which, with fuel and water for a short flight, weigh a good deal less than twenty pounds. The relative weight of an engine decreases with the number of its horse-power, so that there seems no reason to doubt that what Prof. Langley has done on a small scale may be done on a large one, and very shortly at that.

Prof. Langley's machine measures but fourteen feet from tip to tip, weighs complete twenty-four pounds, is solidly built of steel, and, compared with the air which supports it, has a weight of 1,000 to 1. It has no balloon arrangements of any sort, and instead of trying to build a vessel lighter than the air and filling it with gases to make it rise, Prof. Langley has practically built a machine as heavy as he likes and relied upon its shape and power for successful flights.

This is just the opposite of what almost every other experimenter in this field has tried to do, although it was apparent to every one that a flying machine to be of any commercial or practical value whatever would have to be heavy enough and powerful enough to drive straight against or across and in and out of the stoutest gale that blows. Otherwise it would forever be at the mercy of the element. What was necessary was a ship which would ride a storm in the air as a great ocean liner rides a storm at sea.

Prof. Langley has been very careful to say that he never expressed his opinion that man could fly by his own strength. But he has demonstrated that powerful machines, thousands of times as heavy as the air itself, can be built to navigate the air. As to just the measure of his present success the secretary of the Smithsonian is exceedingly reticent as reticent, in fact, as Prof. Bell is enthusiastic. The latter says that he entertains no doubt whatever that a practical air ship for use in war is but a very short way off.

Indeed, Prof. Bell inclines to the idea that within five years his friend Langley's invention will have absolutely changed the face of warfare, will have made armies an impertinence and our $1,000,000 prize battle ships so much useless junk. Just so soon, he thinks, as it is possible to build a machine that will carry half a ton or a ton of dynamite through the air and be easily manageable nobody will want to fight. An army will not care to rest under the constant apprehension of having a ton of high explosive, sufficient to blot it out in a second, dropped down upon it. Nor will a battle ship be of any avail against a similar attacking force.

It is agreed now that it is practically impossible to hit a swiftly moving war ship with the speed of twenty knots or more with a land gun—that is, at any considerable distance. How much more impossible will it be to hit a compact mass of steel hovering so high over head as to seem dwarfed to a speck and circling at a rate of thirty or fifty miles an hour!

Literally Prof. Bell believes that we shall soon realize Tennyson's poetic fancy of the war ships of the world:

Grappling in the central blue.

Interesting as he has now become by reason of his great epoch-making achievement, Prof. Langley was still an interesting figure when his fame rested chiefly upon his eminence in the field of astronomy. That he is not known widely to the public has been due to his innate modesty and his indisposition to seek popular applause in any way, and likewise to the fact that his work has been hitherto of so strictly scientific a character.

His greatest work has been in the study of the sun and of the sun spots, measuring the heat of the great orb of light, and in the stellar photography. It was he who invented an instrument for measuring, with the nearest approximation possible, the heat of the sun, and this instrument, which he called a bolometer, is so sensitive that the temperature of a sunbeam can be tested to a millionth of a degree. With your sense of touch you would be a remarkably sensitive subject if you were able to detect with your hand, for example, the difference of several degrees taken together. This machine registers the variation of a millionth of one. It does not require a fine and technical knowledge of astronomy to marvel at such an instrument as that.