By A. Conan Doyle.

(Copyright, 1894, by the Author.) Lacour in his old age. From about the give us good terms had vanished. In twelve struction, it turned and began to go time of the revolution of '48 until he died hours it would not have mattered. But now the treaty was not yet signed. We should "Hullo" he cried. 'What's this?' in the second year of the Crimean war, he was always to be found in the same corner of the Cafe de Provence, at the end of the was gone, we had nothing to offer in expectations. Rue St. Henore, coming down about 9 in change. the evening and going when he could find no one to talk with. It took some self-restraint to listen to the old diplomatist, for like stories were beyond all belief, and yet he was quick at detecting the shadow of a smile or the slightest little raising of the cyebrows. Then his huge, rounded back with the builder ohin. Then his huge, rounded back of the cyebrows. Then his huge, rounded back of the cyebrows.

circumstantial remance which never ventured upon until his second bottle had been uncorked) of the emperor's escape from St. Helena— how he lived for a whole year in Philadelphia, while Count Herbert de Bertrand, who was his living image, per-sonated him at Longwood. But of all his atories there was none which was more notorious than that of the keran and the foreign office messenger. And yet when ur Otto's memoirs were written it was found that there really was some foundation

for old Lacour's incredible statement.
"You must know, monsieur," he would say, "that I left Egypt after Kleber's assassination. I would gladly have stayed on, for I was engaged in a translation of the koran, and between ourselves I had thoughts of embracing Mohammedianism, for I was deeply struck by the wisdom of their views about marriage. They had made an in-credible mistake, however, upon the subject of wine, and this was what the mufti who attempted to convert me could never get over. Then when old Kleber died and Menou came to the top, I felt that it was time for me to go. It is not for me to speak of my own capacities, monsieur, but you will readily understand that the man does not care to be ridden by the mule. I carried my koran and my papers to London, where Monsieur Otto had been sent by the first consul to arrange a treaty of peace, for both nations were very weary of the war, which had already lasted ten years. Here I was most useful to Monsieur Otto on account o my knowledge of the English tongue, and also, if I may say so, on account of my natural capacity. They were happy days during which I lived in the square of Bloomsbury. The chimate of monsieur's country is, it must be confessed, detestable. But then, what would you have? Flowers grow best in the rain. One has but to point to monsieur's fellow countrywomen to prove it.

| They were happy days news has come from Toulon to Paris, and thence straight to London. Theirs will-come from the cravat.

| "You can have my watch and my purse if you will let me go, said he." Sir,' said I, 'I am as honorable a man the first consul. If we keep our secret, we may still get our treaty signed." "Who are you, then?" "Why name is of no importance." knowledge of the English tongue, and

"You can understand that it was no child's play. After ten years of war each nation had got hold of a great deal which had belonged to the other, or to the other's allies. What was to be given back? And what was to be given back? And what was to be kept? Is this island worth that peninsula? If we do this at Venice will you do that at Sierra Leone? If we give up Egypt to the sultan; will you restore the Cape of Good Hope, which you have taken from our allies, the Dutch? So we wrangled and wrestled; and I have seen Monsieur Otto.

"Well, we went around together in one of Good Hope, which you have taken which should be of avallies, the Dutch? So we wrangled and wrestled; and I have seen Monsieur Otto come back to the embassay so exhausted of the embassay so exhausted of the embassay is carriage, about 7:30. Monsieur care erage length.'

"Help! help! help! he squealed, and I was compelled again to adjust his cravat. that his secretary and I had to help him from his carriage to his sofa. But at last hings adjusted themselves, and the night came round when the treaty was to be finally

'Now, you must know that the one great Now, you must know that the one great card which we held, and which we played, played, played at every point of the game was that we had Egypt. The English were very nervous about our being there. It gave us a foot on each end of the Mediterransan, you see. And they were not sure that that western the sure of the sur that wonderful little Napoleon of ours might not make it the base of an advance against So whenever Lord Hawkesbury pro posed to retain anything, we had only to reply, "In that case, of course, we cannot consent to evacuate Egypt, and in this way we quickly brought him to reason. It was by the help of Egypt that we gained terms were remarkably favor favorable English to consent to give up the Cape of Good Hope; we did not wish your people, monsieur, to have any foothold in South



"YOU FOLLOW ME."

Africa, for history has taught us that the British foothold of one-half century is the British empire of the next. It is not

the treaty was finally to be signed. In the down, slapping my hands to keep them warm morning I was congratulating Monsieur and still straining my ears. And then sudditto upon the happy conclusion of his labors. He was a little pale shrimp of a man, very in Oxford street I heard a sound detach itself, quick and nervous, and he was so delighted and grow louder and louder, and clearer and new at his own success that he could not clearer with every instant, until two yellow sit still, but ran about the room chattering lights came flashing through the the fog. and laughing, while I sat on a cushion in the corner, as I had learned to do in the cast. Suddenly, in came a measuring with a letter which had been forwarded from Paris. Monsieur Otto cast his eyes upon eit and then, without a word, his knees gave more.

Why and he fell appealess upon the floor. While the interest of the parent of action that I am the parent of the reaction that I am the parent of the parent of the foreign minister. It had not stopped the parent of the foreign minister. It had not stopped the parent of dispersions of the foreign minister. It had not stopped the parent of dispersions of the foreign minister. It had not stopped the parent of dispersions of the foreign minister. It had not stopped the parent of dispersions of the foreign minister. It had not stopped the parent of dispersions of the parent of the foreign minister. It had not stopped the parent of dispersions of the parent of the foreign minister. It had not stopped the parent of the pare

"What is this, then?" I asked.
"I do not know," answered the messenger.
"Honsieur Talleyrand told me to hurry as never man hurried before and to put this never man hurry as army in one.
"Sir," said I, touching him upon the arm, are you the messenger for Lord Hawkes-bury, and he army in one are the last month."
"I knew that I am to blame, but I could not the senseless hand of Monsieur Otto, "It is certain. It fell to Abercombie last month."
"In that case," said Monsieur Otto, "It is very fortunate that the treaty is signed. "Very fortunate for you, sir," cried Milouse. "Very fortunate for you, sir, cried Milouse. "Very fortunate for you, sir, cried Milouse. "I have been waiting for you half an hour, said I. You are to follow me at once. He is with the French ambassador."
"I have been waiting for you half an hour, said I. You are to follow me at once. He is with the French ambassador."
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"I have been waiting for you half an hour, said I. You are to follow me at the treaty is signed."
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"I have been waiting for you half an hour, said I. You are to follow me at the treaty is aigned."
"I have been waiting for you are to follow me at the treaty is aigned."
"I have touch a the wait in the day on the Edinburg observatory. T

Rue St. Honore, coming down about 5 in "But we were not so easily beaten, we the evening and going when he could find Frenchmen. You English misjudge us when

There are many folk who knew Alphonse | sideration which had induced our enemies to

"We shall see him presently."
"Let me out!" he shouled. "There's some trickery in this. Coachman, stop the coach!
Let me out, I say!" I dashed him back into his seat as he corrected to traverse in a lifetime. Sir Howard being asked as to the present status of
the side to turn the handle of the door. He
coared for help. I clapped my palm across
took took

Otto
took

This appearatus in a lifetime. Sir Howard being asked as to the present status of
the ten-foot reflector, said: "I have been
asked for and have prepared estimates and a
model of that instrument. There are three
among its kind. It is now being widely disdirectly contrivance.

Expected to traverse in a lifetime. Sir Howard being asked as to the present status of
the ten-foot reflector, said: "I have been
asked for and have prepared estimates and a
model of that instrument. There are three
some problems in the endeavor to obtain a

Hawkesbury!

was a poor little creature, this foreign office messenger, not much bigger than Monsieur Otto, and I-monsieur can seen my hands

would project, and his rs' would burr like would remember he got as far as "Courage" I cried, and then a sudden candle in the window. "The messenger sat quiet for a little, and thought coming into my head, 'How do we know that the English will have news of this? Perhaps they may sign the treaty at me through the gloom. He was partly before they know of it."

There was his story of Talleyrand and There was his story of Talleyrand and there was his me! Why should they know about it? Our was pondering perhaps what he should do



the rain. One has but to point to monstear a fellow countrywomen to prove it.

"Well, Monsieur Otto, cur ambassador was kept terribly busy over that treaty, and all of his staff were working to death. We had not Pitt to deal with, which was perhaps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps as well for us. He was a terrible man, haps a terrible man, haps a terrible man, haps a terrible man, happen as well for us. He was a terrible man, happen as well for us. had not Pitt to deal with, which was perhaps as well for us. He was a terrible man, that Pitt, and wherever half a dozen enemies of France were plotting together, there was his sharp-pointed nose right in the middle of them. The nation, however, had been thoughtful enough to put him out of office, and we had to do with Monsieur Addington. But Milord Hawkesbury was the foreign minister, and it was with him that we were obliged to do our bargaining.

"You can understand that I am on the government service, and that you will see the inside of a jail for this?"

"That is the bet. That is the sport, said I.

"You may find it poor sport before you finish, he cried. 'What is this insane bet of Monsieur Angelo, and in the salon-de-boxe of Monsieur Angelo, and in the salon-de-boxe of Monsieur Jackson, and in the club of Brooks, and in the lobby of the Chamber of Deputies, but nowhere did I hear any news.

Deputies, but nowhere did I hear any news.

Still, it was possible that Milord Hawkes.

getting his portfolio, he came out again, with his cheeks flushed with joy, to tell me that all was well.

"'He knows nothing,' he whispered. 'Ah, if the next half hour were over! 'Give me a sign when it is settled,' said I.

"For what reason?"
"Because until then no messenger shall interrupt you. I give you my promise, I. Alphonse Lacour.'
"He clasped my hand in both of his.

shall make an excuse to move one of the can-dles on to the table in the window, said he, and he hurried into the house, whilst I was left waiting beside the carriage.

"Well, if we could but secure ourselves from interruption for a single half-hour the day would be our own. I had hardly begun to form my plans when I saw the lights of a carriage coming swiftly from the direction of Oxford street. Ah, if it should be the of Oxford street. Ah, if it should be the messenger! What could I do? I was prepared to kill him—yes, even to kill him, dignity and solemnity which a sacred book rather than at this last moment allow our demands, and the young Enlishman be last moment allow our demands, and the young Enlishman he Thousands die to make wriggled and groaned. work to be undone. Thousands die to make a glorious war. Why should not one die to make a glorious peace? What though they hurried me to the scaffold? I should foot upon the ground, were mustered in have sacrificed myself for my country. I front of him in the evening, he said 'I had a little curved Turkish knife strapped have loved the love of earthly good above

me so, rattled safely past me.
"But another might come. I must be prepared. Above all, I must not compromise the embassy. I ordered our carriage to move on, and I engaged what you call a hackney coach. Then I spoke to the driver

"You shall have another guinea if you do what you are told, said I.
"All right, master, said he, turning his my head and thrust at him with it. Pac. he slow eyes upon me without a trace of excitement or curiosity.

"If I enter your coach with another gen-tleman, you will drive up and down Harley street and take no orders from any one but me. When I get out, you will carry the other gentleman to Watter's club in Bruton street."
"'All right, master,' said he again.

went up to that window in hope of seeing the candle twinkle in it. Five minutes passed, and another five. Oh, how slowly they crept along. It was a true October night, raw and cold, with a white fog crawi-Africa, for history has taught us that the British foothold of one-half century is the British conthold of one-half century is the British conthold of one-half century is the British empire of the next. It is not your army or your navy against which we have to guard, but it is your ferrible younger son and your man in search of a career. When we French have a possession across the seas, we like to sit in Paris and to felicitate ourselves upon it. You take your wives and your children, and you run away to see what kind of a place this may be and after that we might as well try to take that old square of Bloomsbury away from you.

"Well, It was upon the 1st of October that the treaty was finally to be signed. In the morning I was coveraged to the weet, shining cobblestones, and blurring child impose. I could not see infly paces in either direction, but my ears and blurring the dim oil lamps. I could not see infly paces in either direction, but my ears have to guard, but it is your ferrible younger see in either direction, but my ears have to guard, but it is your ferrible younger see in either direction, but my ears have to guard, but it is your ferrible younger see in either direction, but my ears and the week straining cobblestones, and blurring the dim oil lamps. I could not see fifty paces in either direction, but my ears have to guard, but it is your ferrible younger. Were straining, straining to catch the rattle of hooted out of the coach, and ah, monsieur, the very first thing which caught my ears and blurring the dim oil lamps. I could not see fifty paces in either direction, but my ears and to retail the very first thing which caught my ears and blurring the dim oil lamps. I could not see fifty paces in either direction, but my ears and the very first thing which caught my ears and the very first thing which caught my ears and the very first thing which caught my ears and the very first thing which caught my ears and the very first thing which caught my ears and the very first thing which caught my ears

way, and he fell senseless upon the floor.

I fan to hlin, as did the courier, and best, monsieur. You, who only see me tween us we carried him to a sofa. He might have been dead from his appearance, but I could feel his heart thrilling beneath introduced for the highest of the carriage lamp. His face, monsieur, was as white as this plate before he had finished.

"Monsieur Otto,' he cried, 'we have aligned the treaty upon a false understanding. Egypt is in our hands."

"What is this, then?" I asked.

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"Monsieur Otto,' he cried, 'we h

"'Who are you, then?'
"'My name is of no importance."
"What do you want with me?'

What do you mean? Do you

"I do not know what made me think of it, save that my translation was always run-ning in my head. He clutched at the door handle, and again I had to hurl him back

into his eat. "'How long will it take?' he gasped.
"'It depends on the chapter,' I answered.
"'A short one, then, and let me go.'
"'But is it fair?' argued I. 'When I say a chapter I do not mean the shortest chap-

was compelled again to adjust his cravat.

"A little patience, said I, and it will soon be over. I should like to recite the chapter which would be of most interest to yourself. You will confess that I am trying to make things as pleasant as I can for

He slipped his mouth free again.

"'Quick, then, quick!' he groaned.
"'The chapter of the came!?' I suggested. " 'Yes, yes.'

"'Or that of the fleet stallion?'
"'Yes, yes. Only proceed!"
"We had passed the window and there was no candle. I settled down to recite the

chapter of the stallion to him. "Perhaps you do not know your koran very well, monsieur? Well, I knew it by

"When the horses, standing on three feet and placing the tip of their fourth to my waist. My hand was on the hilt of it when the carriage, which had alarmed me so, rattled safely past me.

the remembrance of things on high, and have spent the time in viewing these horses. Bring the horses back to me' And when they were brought back he began to cut off their legs and— "It was at this moment that the young

Englishman sprang at me. My God! how little can I remember of the next few minand gave him a guinea. He understood utes! He was a boxer, this shred of a man, that it was a special service. He had been trained to strike. I tried to came from below. But ah, I was too much for him. I hurled myself upon him, and he had no place where he could escape from my weight. He fell flat upon the cushions, and I seated myself upon him with such convic-tion that the wind flew from him as from a burst bellows.
"Then I searched to see what there was

"All right, master, said he again.
"So I stood outside Milord Hawkesbury's house, and you can think how often my eyes went up to that window in hope of seeing went up to that window in hope of seeing ankles. Then I tied the cravat round his mouth again, so that he could only lie and mouth again, so that he could only lie and mouth again, so that he could only lie and mouth again, so that he could only lie and mouth again. had stopped the bleeding of my own nose, I looked out of the coach, and ah, monsieur

> ier's. For myself, I sprang into our em-bassy carriage, and a moment later the door of the minister opened. He had himself escorted Monsieur Otto down stairs, and now so deep was he in talk that he walked out bareheaded as far as the carriage. As he stood there by the open door there came the rattle of wheels, and a man rushed down

THE NEXT CREAT TELESCOPE

ow, and imagine what they were like when was 27 years of age. "Well, now that I had him in my coach, A Mammoth Ten-Foot Reflector Focuses the the question was what I should do with him. I did not wish to hurt him if I could help it. Attention of Astronomers. "This is a pressing business," said he. I have a dispatch which I must deliver in-

THE GIANT OF PLANET GAZIRS 'Our coach had rattled down Harley

street, but now, in accordance with my in Features of the New Instrument Which Sir Howard Grubb Proposes to Construct What then? I asked, We are driving back. Where is Lord -Accuracy Secured by Suspenwion in Water.

(Copyright, 1894, by McClure.)

LONDON, Nov. 1 .- The next great telewould project, and his ra' would burr like a kettledrum. When he got as far as a kettledrum would project, and his ra' would burr like a kettledrum. When he got as far as a kettledrum will be the candle in the window. The bound it over his lips. He still mumbled and gurgled, but the noise was covered by the rattle of our wheels. We were passing the minister's house and there was no length of eighty feet and weigh somewhere candle in the window. very much in the position of the first 100ton gun as compared with the smaller bores

> the big four-foot tube, then disused, which had been the source of all his wonderful very possibly regard as impertment. With Howard Grubb's great tube to point at them, and Mr. Preece's idea of ultimately them, and Mr. Preece's idea of diffinately them, and Mr. Preece's idea of deat in a reservoir 100 feet in diameter, and thou of the tube, and the observe in the direction most convenient to himself." Martians seems to be taking at least a water-tight, of course.
>
> "To appreciate the practicability of this tangible form.

because the French have been devoting much labor of late to the perfection of the reflector, and from the standpoint of photography, which is the all important sphere of coming astronomical work, the reflector has a future before it which its incomplete development has hitherto tended to greatly limit. The difference between a refracting and a reflecting telescope is wide, and for many years refractors have enjoyed the unquestioned preference of observers, and have consequently been the source of most of the advances made in astronomical knowledge. A refractor, like the Lick or the Yerkes, for example, has a large object glass at the outer and of the tube which refracts or bends all movement?" the rays of light from a heavenly body which fall upon it, so as to concentrate or focus them at the other end of the tube where the magnifying lens or eye piece is fixed and gazed through by the observer. The reflector, azed through by the observer. The renector, on the contrary, has no glass at the outer end, but a mirror of the most perfect contend, but a mirror of the most perfect contend, but a mirror being at the bottom, this mirror being the telesco e, and depend only on the friction necessary to be overcome in moving it of such a concave parabolic shape that it through the water. The water currents will not affect all the light back to the tube, and directly or indirectly focuses it at the eye side in a few moments. With a pair of piece as before, the observer gazing at the trunnions attached to the tube at the water reflected image through the side of the tube. reflected image through the side of the tube. Both the refractor and reflector have their special disadvantages, the difficulty in the former being what is called the chromatic aberration, which means the diffigulty of bringing culty if not impossibility of bringing culty if not impossibility of bringing culty if not impossibility of bringing cult the different rays of light to a common there will then be practically no weight upon cous, and the great problem in refractor the bearings of that axis. There will be this construction is by improvement of the glass disadvantage, that it will not be convenient sed, to do away with this aberration TO BE SUSPENDED IN WATER.

the latter. This is the demand of astronomical

larger optical power and size. Great tele-acopes used for photography require an exact-ness of adjustment and clock work motion, to

counteract the motion of the earth and keep them fixed in exactly the same relative

them fixed in exactly the same relative position to the object being photographed, which is almost impossible to obtain with the great tubes and augmented weight now desired. The steat reflectors of the future, however, will have no weight at all, mechanically speaking because they will be floated in water. This strange and novel principle, due to the invention of Dr. Common, is impossible in the case of refractors, because the observer would necessarily be at the bottom of the water, but with reflectors it shows every promise of

with reflectors it shows every promise of availability and enduring success. Conse-

telescopic mounting that has yet appeared, SIR HOWARD GRUBB.

Sfr Howard Grabb as a telescope maker occupies the highest rank. His whole life has been devoted to the study of telescopes and their mounting, and his works at Dublin have built among others the great Vienna telescope.

celestial photography. The great six-foot re-flector of Lord Rosne was built nearly fifty years ago, but its usefulness was always limited by the lack of an equatorial mount-

He is of medium height and slender build, but his great mental activity and rapid speech expected to traverse in a lifetime. Sir Howard being asked as to the present status of and mount the instrument, if desired, foot instrument, make It will have a double steel tube eighty feet between fifty and 100 tons, most probably the in length. The thickness of the steel will be latter. Among all the big tubes now pointed three-eighths of an inch, and the two steel at the heavens it will consequently stand shells will be separated by a space of three tube inches. The object of this is to equalize the temperature and avoid the mixture and conse quent movement of the air at the mouth of scientific aspect will be the departure which the difference of temperature between the it represents from existing methods of con- air inside and that outside, and would cause struction, as well as the influence it will a consequent movement in the rays of light. have upon the plans for the great telescopes of the future and the new knowledge of the of the future and the new knowledge of the universe which will come to us through inside the tube. I thus obtain a steady, slow current of air passing down the tube and

limit of size in telescopes had therein been reached, but from the discussion now in progress it appears that our telescopes may ultimately reach the size of railway tunnels and bring a closeness of observation to bear upon Mars, for instance, which the supposed inhabitants of that interesting planet may very monthly reached of floiation, first suggested by Dr.

The idea of a ten-foot reflecting telescope was first broached by the French, who have marvels of the coming exposition of 1900. This announcement attracted wide attention, because the French have been devoting much labor of late to the mark to the practicability of this practicability of this "How will it be set?"

"How will it be set?"

"The observer will simply set a pair of pointers at the eye end to the particular readings he wishes, and then press a button. The instrument will then set itself labor of late to the practicability of this "How will it be set?"

"The observer will simply set a pair of pointers at the eye end to the particular readings he wishes, and then press a button. The instrument will then set itself labor of late to the practicability of this "How will it be set?" can float it at almost any angle of inclination, and it will remain in perfect equilibrium down to a certain very small angle. The weight of the tube, of course, equals the weight of the water which it displaces. The greatest angle over which it will remain in perfect equilibrium. greatest angle over which it will remain in perfect equilibrium depends upon the form of the tube, but with the proportion sketched the tube will be depressable in perfeet equilibrium to within twenty-five degrees of the horizon. If it is desired to depress it lower than this I shall provide an arrange nent of chains and counterpoises to that end.

"The power will be very small, A one horse power gas engine will be used to charge storage cells in the day time, the current from which will be ample to drive the requisite electric motors at night. The line and these carried on a polar axis, we to use the instrument within 15 degrees

26

occasions."

than strain it into doing 5 degrees more

"What kind of a reflector will it be?"
THE KIND OF REFLECTOR.

"I have designed it on the Newtonian plan.

In all reflectors the light passes down the tube to a concave mirror, which reflects it and would bring it to a focus in the

tube at a distance depending upon the shape of the mirror. Before coming to a focus, however, the light is received on a small

mirror and again reflected to an eye piece located in a convenient position for observa-tion. In the Gregorian form this small mir-

ror is concave, and the light is reflected from it down the tube through a hole in the

center of the large mirror. The eye piece is placed in this hole, and the observer looks up the tube in a manner precisely similar

convex, but is placed inside the focus and the light-is also shown through the center of the large mirror and the direction of ob-

servation is exactly the same. It is obvious that neither of these forms would do for the floating telescope. The other form is that known as the Newtonian, in which the light from the large mirror is received on a small flat mirror placed in the upper end of the table and inclined at

tube and inclined at an angle of 45 degrees. The image of the object looked at is thus formed at the side of the tube, through a

hole in which it is observed. This form has

and is specially suitable for the method of flotation which I propose."
"But is not the flat mirror in the tube a

"Oh, no. It cuts off a little light, but does not interfere with the definition in any way. It would have a diameter of one foot at the outside, and in a tube of ten feet the light thus cut off, from a given heavenly body, would be of no practical importance."

What will be the size of the large mir-

A TEN-FOOT MIRROR.

GREAT TWENTY-SEVEN INCH REFRACTOR, ROYAL OBSERVATORY AT VIENNA.

photography for instruments of larger and of work that would only be of use on rare

quently all the great reflectors of the future will probably be tank telescopes, and this departure is perhaps the greatest novelty in convex, but is placed inside the focus and

drawback?"

importance.

expect, I can procure the material for one of that size, it will be of silver on chemical solution deposited upon the face limited by the lack of an equatorial mounting. It was hung on chains between two walls and consequently covered only a field of 10 degrees on each side of the meridian. In 1888 Sir Howard Grubb mounted equatorially the four-foot reflector at Melbourne and within five years Dr. Common has meunted a five-foot instrument of this kind. THE PROJECTED TEN-FOOT REFLECTOR.

During a late visit to London Sir Howard consented to be interviewed and was seen at the Grand hotel. He is a young looking man, of middle age, with the quick thought and genial manners of an Irish gentleman, and he is very much literested in the coming giant. He is of medium height and slender build, not the back, of the glass. stone Stoney has devised a most ingenious arrangement for supporting telescopic mirrors took his interviewer over more telescopic ground in sixty minutes than he had ever telescope by an automatic contrivance. This apparatus in its present form is a among its kind. It is now being widely dis-among the kind. It is now being widely dis-different projects under discussion, but with really good reflecting telescope, and I shall utilize it or a medification of it in the ten

> 'What will be the cost of such a mirror? How large is the spherical part of the

PROVISIONS FOR THE OBSERVER. "Twice the tube's diameter, or twenty which preceded it, and its most interesting the tube. This movement would arise from as you see in the model, that the projecting end of the tube above water will six feet in length, and the holes for eye-pleces, as in the model, wil be at the top and five feet above the sphere. As to convenience in getting at the eye end, there need be no difficulty whatever in this As the eye-piece is only about fifteen feet from the center of motion, the when your husband goes down town not feeling movement of the observer is never more well, and, above all, when your child trudges off When the family of Sir William Herschel which held tea parties and memorial services in the big four-foot tube, then disused, which had been the source of all his wonderful discoveries, they doubtless thought that the discoveries, they doubtless thought that the strument of this weight by clockwork, if it is retailed to the observer is never than three feet per hour. By means of a platform, such as that shown in the figure, in 77, with additional times are made and the platform, such as that shown in the figure, in 78, with the instrument of the observer is never to than three feet per hour. By means of a platform, such as that shown in the figure, in 78, with the instrument of the observer is never than three feet per hour. By means of a platform, such as that shown in the figure, in 78, with the instrument of the instrument, the eye end is readily according to the instrument of the instrument, the eye end is readily according to the instrument of the observer is never than three feet per hour. By means of a platform, such as that shown in the figure, in 78. method of floiation, first suggested by Dr. readily rotated through intervals of 30 de-Common, a principle which I have somewhat grees. By these means the image of the developed in the present instance. The steel celestial object to be observed could be tube carrying the reflector at the bottom will sent through either or any of the perforations for the perforation and the observer always MEDICINE COMPANY, corner William and

"I should expect to finish it within four years from the date of commencing." What is your estimation of its total cost?"

"About £30,000." "What great advantages do you look for from the use of the ten-foot reflector?" WHAT IS HOPED FOR.

"Generally speaking, all those advantages which come from increased optical power During the last ten or fifteen years we have advanced some fifteen inches in the size of ur refractors, that of the Yerkes being now forty inches. In the next ten or fifteen years we may advance proportionately, and probably eventually attain a refactor of sixty inches. All those who use large telescopes know only too well that the larger the aperture the fewer are the oppor-tunities on which it can be used with advantage, and the question has often been dis-cussed as to whether the useful limit of aperture has not already been reached except where the instrument can be mounted in such favored localities as Arequipa, for in-stance. The conditions of life at these isolated stations are not of the happiest, however, and though observers, in the cause of science, may put up with the difficulties temporarily, they will not do so permanently, and the conditions so far interfere with the steadiness of the work that relays of workers have already been found necessary in some cases which plan is open to objections. It appears TO BE SUSPENDED IN WATER. of the pole. I could plan it to work closer to however, that the new photographic system there is another difficulty, however, which, the pole than this, but I prefer to have the with recent improvements in the reflector, instrument do perfectly nine-tenths of all mospheric disturbance. Consequently we can has created a new and great opportunity for the work that will be required of it rather use and use with efficiency large instruments enveniently within the confines of civiliza

ion, a great gain in itself.
"Moreover, we shall be able to use with advantage, and in these accessible positions, instruments of a far greater power than have hitherto been built, and instruments whose value was very doubtful so long as the old system of eye observations was the only one available. Photography, in other words has created a demand for larger and larger telescopes. Whenever we double the diameter of the aperture we get four times the light. In photography this is of maximum importance, because by doubling the diameter we can obtain a result, say in one hour, which previously required four. A twelve-hour exposure, other things being equal, should give us as good a photograph as forty-eight hours exposure with an instrument of half the size. Now, we can certainly obtain these large instruments in the form of reflectors, while it is doubtful if we shall be able to in the form of refractors.

VARIABLE POWER OF TELESCOPES. "The power of a telescope varies as its aperture. It must be clearly understood that this is different from its magnifying power. Most of the work now done with large refractors is done with magnifying powers, which are equally unable with in-struments of less size. Jupiter or Saturn viewed with a magnifying power of 300 and a twenty-eight inch aperture are very differ-ent objects from Jupiter and Saturn viewed with the same magnifying power and an eight or ten-inch aperture. The definition, eight or ten-inch aperture. The definition, the detail, the delicacy and the perfection of the image are far greater from the large aperture than from the small, and these valuable and desirable qualities will increase. other thing sbeing equal, as the size of the aperture of the light-grasping power in-creases. The difference between the twentyeight inch and ten-inch images, with the same magnifying power of 300 would be the same as that between a drawing with a finely pointed lead pencil and that made with a crayon or a stump; between a steel engraving and a mezzo-tint, so to speak. The point at issue is simple. The time has gone by when any great or starting dis-covery is to be looked for through the tole-scope. The chief work of the future, the study of the nebulae, the watching of the heavenly bodies, the record of their appearance year by year, and, in fact, all the great problems which astronomy has before it for solution, will largely be undertaken by great

photographic telescopes.
"Great reflecting mirrors we can easily get Lord Rosse's reflector of seventy-two inches is now over fifty years old. If it we equatorially mounted it would now splendid work. If we can mount these monster reflectors as perfectly as the present largest refractors, and personally I do not doubt that we shall be able to do this, we have a certainty of the large telescopes which have a certainty of the large telescopes which we need. That we can get instruments of these desired sizes in refractors is not a certainty at present, and it will be long before this prospect becomes a certainty. Consequently, I look to a wide field of usefulness for a ten-foot reflector, such as I have designed, and believe that steady improvements will both increase the size and broaden the sphere of the long projected reflector, which may after all neglected reflector, which may after all prove to be the telescope of the future,"
HENRY J. W. DAM.

Rev. Dwight L. Moody, the evangelist wiff, it is said, make a six months' tour of Japan, preaching in all the principal cities.

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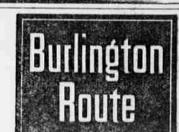
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