A PHOTOGRAPH, TAKEN ESPECIALLY FOR THIS NEWSPAPER, SHOWING YALE'S CRACK ELEVEN MAKING THE MOST BRILLIANT PLAY OF THE FOOTBALL SEASON. THIS IS THE CLEVER RUN THAT HAS PUZZLED ALL THE TEAMS WITH WHICH THE NEW HAVEN MEN HAVE PLAYED

TAKING PICTURES OF THE HEAVENS.

The Latest Achievements of Science Have Reduced a Thousand-Year Astronomical Problem to a Matter of One Night.

By W. B. Northrup.

To photograph and map out the entire heavens—to search, with the camera, the profoundest depths of space—to bring to light all the heavenly bodies far beyond the vision of the most powerful telescope—to tabulate and catalogue millions of stars—is the stupendous task which the International Astrographic Congress set itself to perform when it convened in Paris, April 16, 1887.

The work of this congress is nearly completed, and already sections of the star charts are being printed and sent to the eighteen different observatories interested in the undertaking.

Mapping the entire heavens will prove an epoch-making enterprise. Future generations will chronicle the achievement as one of the greatest of this century, and each astronomer aiding the work will hold a charter to fame.

THE FAMOUS YERKES OBSERVATORY, WHERE SOME MARVELLOUS FEATS IN ASTRONOMY HAVE BEEN ACCOMPLISHED.

Fifty-five delegates, representing the fifteen most enlightened nations, deliberated for nine days in Paris in 1887, deciding to make the great star map, and eighteen observatories were appointed to do the work. The meeting was the result of a suggestion made on June 4, 1886, by Dr. Gill, of the Royal Observatory, Cape of Good Hope. It was fitting that Dr. Gill should originate the work, for it was from his famous photograph of the comet of 1882 that astronomers the world over turned their attention in the first instance to star photography.

AN AMAZING WORK.

The new star map is an amazing work. The patchwork of photographs will cover an immense globe having a diameter of twenty-four feet. During the work 44,000 photographs will be taken, and a catalogue of 2,500,000 stars will be made. Each photograph, to avoid errors, will be duplicated. Altogether more than 30,000,000 stars will be photographed.

Previous to the middle of this century such a work would have been considered beyond the bounds of possibility. To tabulate these stars in the ordinary way would take thousands of years and the stars themselves would change their places before the work could be half finished. It is only through photography that it can be done at all. The entire work could be done in one night, so far as the actual photographing is concerned, but varying conditions of atmosphere, climate and season have rendered necessary the spending of a number of years.

Wolf's great map of the Pleiades, whereon but 671 stars are shown, took many years of the closest visual observation to complete. To-day, photography, in an hour's exposure, shows 1,421 stars of the same group, furnishing accurate data for calculations unattainable by visual means. Telescopic observations during eclipses are now subordinate to photographic records. Rapidly changing objects in the heavens—objects too fleeting to be observed by the eye—are caught on the sensitized plate and stored up for leisurely study.

The photographic plate is accumulative and permanent, whereas the retina of the eye only retains its impression for a tenth of a second at the most.

Beyond that effacement and renewal continually go on.

For ordinary purposes it is well that this is so. Did not our eyes possess the faculty of obliteration past occurrences only would be ever before our vision.

But for astronomical purposes the human eye is a thing of the past. The camera has taken man's place at the eye end of the telescope. The order of the stars, the secrets of the sky, unveil themselves before the patient stare of the photographic plate. As Herschel has said, "the camera is the retina that forgets not." It discerns stars beyond the range of the best telescopes. In the atmosphere of Paris the satellite of Neptune was never seen by the telescope; every part of its orbit was measured on a photographic plate.

The lens of the camera is of more astronomical value than the lens of the finest telescope. More accuracy obtains in measuring a plate than was possible in visual measurement. One five hundred thousandths of an inch and less on a photographic plate furnishes data for accurate star measurement; where the telescope will show but 50,000,000 stars, the sensitized plate exhibits more than 160,000,000.

Again, owing to the great sensitiveness of modern plates the images thrown upon them may be highly magnified while the exposure is kept very short.

Five one-thousandths of a second is all the time required to photograph a star of the first magnitude. Stars visible to the naked eye may be photographed in half a second, those of the fourteenth magnitude requiring thirteen minutes. By exposing a plate for an hour all the stars down to the fourteenth magnitude inclusive will be marked on the plate, each in proportion to its power and the duration of the exposure.

Though light travels at the inconceivable velocity of 187,000 miles a second, yet light from some stars in the range of the telescope takes 5,760 years to reach the earth. We may see on the photographic plate pictures of stars, not as they are, but as they were perhaps half a million years ago; light is still reaching us from stars which have long since become extinct.

It is possible that the plate of the camera is to-day catching from stars light which has been travelling earthward millions of years—which may, indeed, have set out toward the earth before this planet came into existence.

The first star photograph was a daguerreotype of Vega taken at Harvard College July 17, 1850. The younger Bond, by the collodion process, obtained in 1857 photographs of stars of the first magnitude.

No serious effort was made in stellar photography until after 1882, when Dr. Gill photographed the comet of that year at the Cape of Good Hope Observatory. He attached an ordinary portrait lens with a two-inch aperture and a focus of eleven inches to the telescope, using the instrument as a "finder" to the camera. Photographs lasting from half an hour to two hours and twenty minutes were taken.

The new photographic map is preceded by a visual map commenced a quarter of a century ago by Bonn and completed by Argelander. Its object was a great star census. It was begun in the Northern Hemisphere and brought by Schonfeld to within 20 degrees of the equator. This "Durchmusterung," or "roll call of the stellar army," is divided into two sections, and tabulates 485,000 stars.

Stars not entered in it have no official existence. Should they vanish the fact cannot be attested; should they brighten into conspicuousness they must be regarded as new for lack of previous acquaintance. Whatever is known of the distribution of stars is taken from that enumeration.

The photographic map proposed by Dr. Gill will extend from Schonfeld's zone to the South Pole, and will include all stars up to the fifteenth magnitude. The fourteen magnitude stars are on the limit of faintness. Beyond these stars photographic images are vague.

MR. THOMAS WALSH, THE COLORADO MILLIONAIRE, WHO ENJOYS THE UNIQUE DISTINCTION OF BEING PARTNER IN BUSINESS TO KING LEOPOLD OF BELGIUM. HE IS REPUTED TO HAVE AN ANNUAL INCOME OF $1,200,000, AND IS A GREAT PHILANTHROPIST.

An Odd Holiday.

Last month the railway town of Crewes, in England, enjoyed a holiday and festival, the occasion being the completion of the four thousandth locomotive built in the great railway shops there.

A Patriotic Island.

From the Isle of Lewis, in proportion to population, does the most of England's fighting men come. The total population is 28,000, and no fewer than 4,000 serve the country in one capacity or another.

The Great Seal Keeper.

The best and most lucrative position to which a barrister can rise in England is undeniably the Lord Chancellorship. It is worth $50,000 a year, and it is a fact that many past Lord Chancellors were the sons of poor men. One was the son of a country barber, while the father of another was a Newcastle coal heaver.

TEACHING A KING HOW TO GET RICH.

Thomas Walsh, Partner in Business to Leopold II., is Showing That Monarch How to Make Money.

The latest American to ingratiate himself into the favor of a European monarch is Thomas Walsh, the Colorado millionaire. The monarch with whom Mr. Walsh is upon such easy terms is Leopold of Belgium, who is to become a partner in business with the American Croesus.

King Leopold never knew what easy money was until he met Mr. Walsh, and now that he knows he wants some of it.

The millions of francs he is reputed to have pulled out of a sub rosa interest in the Ostend gambling tables have cost him endless censure, even granting that no qualms of conscience have figured on the debit side of the ledger. The millions the Congo commercial enterprise have yielded have been anything but easy money. Some of his commercial enterprises in Belgium have produced nothing but deficits.

It was in the hope of getting the millionaire American to make up one of these deficits and put the International Sleeping Car Company on a paying basis that His Majesty went after Walsh when the Coloradoan began to cut his swath at the Paris Exposition. The attempt at an understanding in that particular regard has resulted in a general partnership between King and citizen for the purpose of enlarging Walsh's strength on the speculative market and increasing the return on Leopold's invested funds.

It came about this way: Walsh's lavishness at Paris attracted the attention of Continental financiers, and notably the attention of those who wished to unload. Charles Nagelmackers, the Belgian president of the sleeping car company, in which Leopold is largely interested, thought Walsh's money and business sagacity might transform the company from a losing train, equipped at Leopold's expense, into a profitable venture. A special brought the Walsh family from Paris down to Ostend, and Walsh looked over the ground.

"Really," he said, after investigating the company, "your sleeping car company cannot interest me. Under the best auspices it could not pay more than 4 or 5 per cent.; whereas I realize from 10 to 20 per cent. on my money."

Leopold wanted to know all about it. He wanted to know also if a mere king with a few millions in his stocking might venture to shear the lambs to a 10-percentum tune. And the result of the conference and of Leopold's careful investigation of Walsh's record is the partnership that has struck conservative Belgians speechless with astonishment.

It is doubtful if any other individual at the Paris Exposition gained so much notoriety as did "Tom" Walsh, as he is called by his friends. He is said to have dined every American in Paris and his dinners were always given at the costliest hotels.

The farewell dinner given to the American Colony at Paris by Mrs. Walsh was the most elaborate entertainment Parisians have ever seen. For this occasion the whole lower floor of the Elysee Palace Hotel was occupied and converted into a floral bower, with thousands of chrysanthemums, American beauty roses and orchids imported from the United States especially for the occasion.

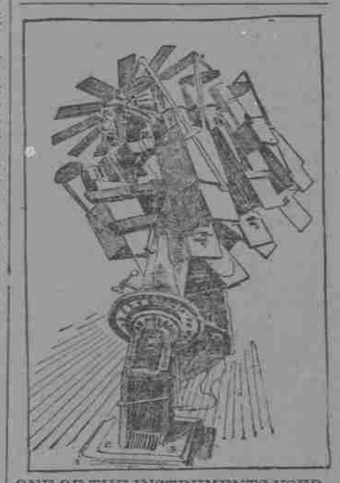
Then to put a climax to the whole affair the Walshes dined Leopold King of Belgium, spending something like a hundred thousand dollars upon the royal banquet. The dinner was given at the Hotel Ritz in the splendid banquetting hall where Harry Thaw, of Pittsburg, gave his famous dinner to the beauties of Paris.

The music was afforded by the Czar's own band which was at the time in Paris. Only once before had a private individual succeeded in securing the able services of these royal musicians, and that person was a favorite at the Court Russia, the Duchess Rohan. But the American millionaire whose doings had set the boulevards of Paris agog had become self-confident in his newly acquired fame and no request was considered too bold for him to make. He negotiated for the services of the musicians and secured them, and King Leopold listened at Mr. Walsh's dinner to the weird, delightful music of the Czar's own band and ate of the dainties prepared by an American chef.

Probably the item that commands most attention in the history of Mr. Walsh next to his becoming associated with a real king in business, is the one that places his income at $1,200,000 a year. It explains his extravagances satisfactorily. With $100,000 a month, even in Paris at the Exposition season, one may be lavish.

It is just fifty years ago since Thomas Walsh was born in Tipperary, Ireland.

Twenty-five years later he was a laborer in the sewer department in Worcester, Mass.



ONE OF THE INSTRUMENTS USED IN CONNECTION WITH PHOTOGRAPHING THE HEAVENS.

BERNHARDT HERE.

The Great Tragedienne, Younger and More Charming Than Ever,

American theatre goers are soon to have the pleasure of seeing Sarah Bernhardt in the two plays which during the last year have won more fame in Europe and in America than any other dramatic productions of the century, many claim.

The Divine Sarah will take the leading parts in both of these plays, "Cyrano de Bergerac," and "L'Aiglon," and she will also appear in her famous impersonation of "Hamlet."

She will be supported by Coquille, who is the foremost actor of France, and will make a tour of the country extending probably over six months, or until the close of the theatrical season in the spring of 1901.

In Paris just now one hears of no one else but Madame Bernhardt. And what are the people saying? You will no doubt imagine that they are still praising her wonderful acting and marvelous methods by which she retains her youthful strength and vigor, but neither of these is what interests Parisians, and in fact Britishers and Americans as well, just now.

The first and most important subject of discussion is the publication of an extract from the unpublished autobiography of the great tragedienne's life. The next is that she is accredited with having changed the feminine figure in a single night! Both distinctive in their own peculiar lines and sufficiently important to set society and the professional world a-gossipping.

The Venus de Milo and all her old time relatives have been shown us for years as the high and true type of feminine form. But, while we looked and admired, we did not believe that beauty lurked in such broad lines.

Then came the meal bag period. Women went corsetless and tied a string around their middle. They wore blouses, and wide loose sashes dividing them in half with often the string visible. It was dreadful. Women who wore these gowns looked at you brazenly with the courage of their convictions. Others looked on and laughed, and drew their corset strings a little bit tighter.

Then came the long straight line, the draped gown, they called it. It began at the shoulders and ended at the feet without a break. Women presented solid fronts of silk with lace appliqued all over them. Velvet fell from neck to floor, looking all the world like a portiere.

Then came the reaction. Corsets were made stronger and the strings were pulled tighter. It really took two maids to get a woman into her gown; and then it took an extra hand to hook the waistband, which came around the waist underneath the gown, while careful fingers smoothed and patted the subject and finally turned her out a perfect tailor made woman, moulded into her gown. What she endured from the agony of those tightly drawn strings, how she felt above and below them, how she breathed, and in what manner she kept her organs working, no one but herself knew, for women do not betray the confidences of the corset strings.

At night, in grim silence, she smoothed the marks of the side steels from her ribs and congratulated herself that the strings had done their self-appointed task of maintaining an appearance.

As for the organs, they were squeezed either up or down; and in either case they planned revenge. Did they get it? Ask the woman who found time or occasion to battle with the problems of life. Just ask her what those organs said when the time came for them to exert themselves. Not at home, out of their sphere, dissatisfied, weak and inefficient, they got even with the tailor made woman, all at once!

Bernhardt, that wonderful woman, who has laughed at human emotions for a quarter of a century, looked on with the rest of the world of women leaders and saw it all. It is said that, when the project of changing the feminine ideal was in her mind, she spent whole days at the Louvre studying each curve and becoming acquainted with each deflection of the feminine muscles. She saw where the lines should be, where the cut off mark of the figure naturally came, and she also saw the chance for an ideal. The tall slender boys, with figures like girls, assisted her in their unconscious grace, and she watched them and slowly developed her ideal.

And Bernhardt did it. She who wears no corsets at all, but who is so exquisitely muscular that her form maintains itself, clasped her belt low around the abdomen and smiled when she saw others doing the same. Her belt measure was the same as her bust measure, but she got the curve inward at the middle of the back, and that was what she wanted.

THE RAPID STRIDES WHICH SCIENCE HAS MADE ALONG ASTRONOMICAL LINES ARE AMONG THE GREAT ACHIEVEMENTS OF THE CENTURY. THIS TELESCOPE IS THE LARGEST AND MOST POWERFUL EVER INVENTED BY MAN.

About a Popular Writer.

As everyone knows, Miss Marie Corelli cares very little for society; in fact, has a mild contempt for members of the upper ten. But at the same time society itself evinces a keen interest in the talented authoress, and would willingly, if it were possible, have her mix among the leading aristocracy. So little is known of Miss Corelli personally, that it is sometimes very amusing to hear people express an opinion as to what she is like in their own imagination. Some people jealously inclined have gone so far as to characterize her as being old and ugly, and consequently she lives a secluded life. As a matter of fact, the great authoress is really a very pretty woman. She is rather below medium height, has a graceful and delicately rounded figure, fair complexion and light brown hair. Her nose is slightly aquiline, and her eyes are of deep blue with a merry twinkle about them. Miss Corelli always dresses with elegance, frequently in white, while her taste in headgear is unexceptionable.

An Immense Encyclopedia.

The Emeperor Kang-Ho, who reigned from 1661 to 1721, appointed a commission to reprint in one huge collection all matter of literary interest relating to China. When the commission finished their labors they were able to lay before the Emperor an encyclopaedia of 6,109 volumes! The contents were divided into thirty-two heads. Only a small edition was printed off in the first instance, and then, owing to a monetary crisis, the copper type used was melted down to make cash.