

He Showed Thousands the Stars

Astronomy—Biography

By JAMES STOKLEY

Within a few years a huge eye, nearly seventeen feet in diameter, will search the skies from a California mountain. The 200-inch telescope of the California Institute of Technology, twice the diameter of the present largest telescope, has passed the stage of conversation. Thousands of hours of hard work will be required before success is achieved, but that work has already started.

Today a remarkable group of scientists are engaged in the preliminary stages of this work. Dr. George Ellery Hale, founder and first director of both the Yerkes Observatory and the Mt. Wilson Observatory, is the guiding spirit behind the project. Dr. John A. Anderson, Mt. Wilson astronomer and physicist, is in executive charge. And working with these two men are the other astronomers, physicists, opticians and engineers, whose individual contributions will all aid in bringing the project to a successful conclusion.

Most of these scientists, as one would expect, are men from great laboratories, observatories and other research institutions—men whose names have been widely known in scientific circles. But one of them is a man who was called to this work from a small Vermont town, a man whose specialty is versatility and who is able to advise on many phases of the work.

Russell W. Porter is this man. Despite his years of interest in astronomy, and the fact that his ability has received such high recognition, he still retains a becoming modesty. Though he went first to Pasadena last November, he is still hardly able to realize his good fortune.

"Do you know?" he said the other day, referring to Dr. Hale and his other colleagues, "I used to regard these men almost as gods, and now I am working with them!"

As a matter of fact, the circumstances under which he was called to Pasadena were most dramatic. He was working as optical associate with the Jones and Lamson Machine Co., in Springfield, of which his lifetime friend, Dr. James Hartness, former governor of Vermont, is president. Mr. Hartness has dubbed his colleague the "Leonardo of Springfield," so highly does he value his many talents.



RUSSELL W. PORTER, optician, artist, arctic explorer, engineer, telescope maker and fountain head of the amateur telescope making movement in the United States, shown with the Garden Telescope, one of many of his inventions to bring more people a sight of the stars.

On a beautiful autumn day last October, he yielded to the call of nature, and took his family on a picnic to a hill near Springfield, where they had their lunch around the campfire. Late in the afternoon he returned to his combination shop and laboratory to work on a spectroscope that he was making. On it was a brief note. It said tersely to report to Mr. Hartness, who was in his den. The Hartness "den" is an underground study, office, library, shop and rest room all combined, and is reached by a tunnel from the house. Attached to it also is an observatory, with a turret telescope, a type of which Mr. Hartness is the inventor.

So Porter repaired to the den, wondering what was up. When he reached there he found two strangers in conference with the "Governor." One was introduced to him as Dr. John A. Anderson, the other as Mr. Francis G. Pease. Both are eminent members of the staff of the Mt. Wilson Observatory. The former is the executive officer of the observatory council of the California In-

stitute which is charged with the design and construction of the great new telescope, the second was chiefly responsible for the design of the mechanical parts of the observatory's 100-inch telescope, still the world's largest.

"We want you to come out to Pasadena and help in the design of the 200-inch telescope," Dr. Anderson told him. Probably no man ever received an offer with greater surprise. He had heard about the great telescope that was contemplated, of course. In fact, he knew that one style of mounting that had been favorably considered for it was one that he had suggested in an article in *Popular Astronomy* in 1919. But that he should be asked to take any part, however small, in its construction! Probably he would almost as soon have believed that the country would elect him president in the campaign then drawing to a close!

Already the matter had been broached to the Governor. Naturally, he was sorry (*Turn to next page*)

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STELLAFANE, the astronomical club house built by the Telescope Makers of Springfield. This is the scene of many an all-night vigil through a battery of telescopes set on piers in front of the building

to lose the services of so valuable an employee, but he has never stood in the way of advancement of his men. Really, as an astronomer and telescope-maker himself, he wished that he could go along, too!

So early in November Porter set out for Pasadena. When he arrived, he found the work in its preliminary stages. Many parts of the telescope will be made in Pasadena, so before any actual construction can be done, the shops must be prepared. There must be machine shops, equipped with machinery for handling the heavy parts of the instrument, some of which will weigh several tons. There must be optical shops, for grinding the quartz, or glass, if that is finally used, from which the mirrors will be made. The telescope will require more than the single seventeen-foot mirror. Smaller mirrors will be needed to use with it—that is, mirrors that are small compared with the large one, but that are as large as many of the biggest present ones. These mirrors must be tested, so long tunnels must be provided where the temperature and air currents can be closely regulated. The extensive machinery for grinding them to the proper curves must be provided for.

In getting ready for all this activity Porter's talents were found partic-

ularly useful. His experience with the Jones and Lamson Company gave him an intimate acquaintance with shop machinery of the largest size. His optical work in the past had given him an insight into the problems of mirror making. As an architect he could aid in the design of the buildings themselves, and as an artist he was able to advise in the more decorative features. For the new buildings will be part of the California Institute of Technology, a group conceived by the late Bertram Grosvenor Goodhue, one of the most famous of modern architects.

Though Porter is now engaged in the greatest project with which he has ever been connected his past achievements alone would entitle him to well-deserved fame.

It was on December 13, 1871, that Russell Williams Porter first saw the light of day from Springfield, the town with which his name is so inseparably connected. The family was of old New England stock, known for its cultural traditions.

The nature of his upbringing is well shown by a childhood incident described by his close friend and associate, Mr. Oscar S. Marshall, in *The Vermonter*.

"Russell Porter is the youngest of five children, and his parents were Swedenborgian in religion, which

this Springfield incident will typify. One day his father by the method of elimination, discovered that it was Russell who had marred some window panes by stone-throwing. Handing the lad a few pebbles and withdrawing a few paces, he requested his son to throw the stones at him just as he had at the building. 'Golly! That nearly broke my heart,' says Russell."

His boyhood chums considered him to be rather lazy, says Mr. Marshall, and his rather plump figure caused him to be nicknamed "pursy" or "pussy." But when he got into college, first at Norwich University, then the University of Vermont and finally Massachusetts Institute of Technology, he could no longer be accused of laziness, if, indeed, it had ever been justified. While at "Tech" he won the Beaux Arts prize for the best design in architecture—the most coveted of awards for the embryonic architect.

But despite his talents which promised high fame in architecture, the routine of such a life had no appeal for him. He did design a very pretty little library for his native town, which was built and still stands near the Jones and Lamson works, a monument to his ability in this field. However, exploration called him. With a fellow student he made an all-water trip around Boston, crossing some building lots in the city proper at high tide. Then he felt the urge of the Arctic. Three student excursions to Labrador and Greenland which he organized and directed gave him experience. Then he joined one of Peary's expeditions and later went on others. The Fiala-Ziegler expedition in 1903-1905, in which he was second in command, was the most strenuous. The relief ship failed to make its way to their quarters at the southern end of Franz Josef Land in 1904, so they had to submit to the rigors of a second Arctic winter without adequate supplies.

His services with these expeditions, which took him within the Arctic Circle ten different times, were as varied as could well be imagined. Artist, topographer, surveyor, astronomer and collector of natural history objects—these were some of his duties. Around the walls of his home today are many striking water colors that he painted on these expeditions. Despite their beauty, they were probably painted under the most difficult conditions that an artist ever encountered, for often it was (*Turn to next page*)

Maya Aristocrats Squeezed Skulls

Archæology

By DON LUIS ROSADO VEGA

Señor Vega is director of the Archæological and Historical Museum of Yucatan, located at Merida.

It seems probable that the Mayas who built the great pyramids and temples whose ruins are now the wonder of the world followed the strange, and to us barbarous, custom of artificially deforming the skulls of their children, to give them what was doubtless considered an elegant and pleasing shape. That this art, followed by many primitive peoples and especially frequent among certain Amerind tribes, had its devotees at least among the Maya aristocracy is attested by

two well-preserved skulls found in a tomb near Progreso, on the northern coast of Yucatan.

The two skulls showed the same type of deformity. They had had boards bound against top and back in infancy, when the bones were soft, so that the head-form assumed a startling and unnatural length. It is impossible to determine the sex and age of the individuals to whom these skulls belonged, but it is evident that they were mature adults. This is shown especially by the condition of the teeth. It is conjectured that they were men, because musical instruments, including a flute,

were found associated with the burials; and musicians were usually men.

It is greatly to be regretted that skeletal material of the ancient Maya is so nearly totally lacking. Almost nothing is known of their burial customs, and most of the few known tombs were plundered before scientists could have access to them. It is to be hoped that new work in the less accessible ruins will uncover burials telling more of how the Maya treated their dead, and at the same time yielding specimens for study by physical anthropologists.

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necessary to keep his water melted over an alcohol lamp, and to dip his brush in it frequently to prevent it from freezing.

In 1907 he abandoned the Arctic, and settled down to domesticity. He married, and settled at Port Clyde, Maine, his wife's home, where his interest in telescope making began. To make a living, he built cottages for summer visitors, but to gratify his higher tastes, he made lenses and mirrors for telescopes. Though he had never made a telescope mirror before, and at that time there was little published on the subject, he proceeded to work out his own methods, and made some as large as 16 inches.

His *alma mater* called him, and in 1916 he went back to "Tech" to teach architecture. But not for long, for when the United States entered the war, he found his most useful place was in optical work at the Bureau of Standards in Washington. It was here that he first made the acquaintance of Dr. Hale, who was then organizing the National Research Council, an organization of inestimable value in American science.

The war over, he was summoned back to Springfield, by his old friend James Hartness, who was destined, in 1921, to be elected governor of his adopted state of Vermont. As optical associate of the Jones and Lamson Company, Porter contributed a number of useful inventions resulting from his profound knowledge of optics and mechanics. But perhaps of even greater significance was his organization of a group of telescope makers.

Men and women from the plant—some clerical workers, others from the shop, they were. None had ever before had any astronomical or opti-

cal experience, but under the Porter guidance all made creditable reflecting telescopes. All felt the thrill which comes of looking into an instrument fashioned with one's own hands, and seeing the rings of Saturn, the moons of Jupiter, the craters of the moon, and other sights never seen by unaided human eyes. It is a wonderful experience to have one's first sight of these objects through a great observatory telescope, but to see them with one's own handiwork, is to give one some idea of the joy of discovery experienced by a Galileo or a Huygens.

In order to get a clear sky, into which their telescopes could be poked at will, the group made several all-night vigils on nearby hills. This led to the establishment of an astronomical club house, high above the town, which they built themselves and called Stellafane—the temple of the stars.

From a local activity, the telescope makers developed into a national movement when Albert G. Ingalls, one of the editors of *Scientific American*, heard about it. Mr. Ingalls was already interested in making telescope mirrors, so he soon found that he and Porter were united in devotion to a common cause. Publicity came for the telescope makers of Springfield, directions for making telescopes were published, and finally a book was issued, with Mr. Ingalls as editor, containing not only Mr. Porter's instructions for making the mirrors, but also all the other material that could be gathered on the subject. This provided the first modern book on telescope making, and led to other groups throughout the country. A group of amateurs in Pasadena, others in New York, some high-school

boys in Washington—these were but a few of the telescope clubs that were formed. Telescope making is not a difficult task, but it requires patience, and to the person who is willing to give this time and energy it offers large returns in the pleasure of beholding the results.

Naturally, telescope making centered around Springfield as its capital, and in 1926 its adherents held a convention there. From near and far they came, many bringing telescopes with them, camping out several nights at Stellafane, comparing the merits and performance of their instruments. Every summer since then, a similar convention has been held at the same place under Porter's leadership.

But now the telescope makers at Springfield will have to get along without him for eight months of the year. No longer will his bald head and ever-present stogie be in evidence at Stellafane, except during his return visits in the summer. But other leaders have arisen to carry out his work there while he is engaged in the still greater labor of helping to build the world's greatest telescope. Quite a contrast it is. Instead of making a small mirror by hand, out of simple parts, costing perhaps \$10 or \$15, his present endeavors are concerned with a project on which millions will be spent, with the finest of mechanical equipment. Wonderful discoveries may be confidently expected with its aid, and this modest man from Springfield may well feel proud of his part. But after all, is not the insight that thousands have been given into the nature of the world around them through his work of nearly as much significance? One wonders.

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