

ica. It is 400 odd years old, and is battered and knocked up by the earthquakes of the past, but as you go through it you get the impression that the town is almost brand new. It looks as though it had come from a band box. The houses are mostly one-story stone boxes, but their walls are painted in the most delicate tints of blue, pink, cream, green and gold. I posted my letters in a postoffice tinted in ashes of roses. I bought the fruit I ate for breakfast in a sky-blue fruit store, and cashed a draft on London in a bank which had outer walls the color of gold. Another peculiarity of Arequipa is that most of its rooms are made in the shape of vaults. The stores are vaults ten to fifteen feet wide and from ten to thirty feet deep, with doors looking out upon the streets. In many cases there is no way out at the back, and the only light, except that from the door, comes in through holes in the roof. I ate my dinner at the hotel in Arequipa in a vault, I was shaved in a vault and my sleeping room had a vaulted roof. I went out on the roof once or twice to look over the city. These vaulted roofs gave it the appearance of a Chinese graveyard rather than that of an American town. The streets are narrow and paved with cobbles. Down one side of each street there is a rushing stream of mountain water, which carries off the sewerage, and which, as it gurgles through the streets at night, makes you dream of rain and go to the window as soon as you wake to see if it really is clear or not. It rains only a part of the year in Arequipa, but when it does rain it sometimes pours. At such times the streets are flooded, and the water from the roofs is carried out by little tin pipes, as big around as a broomstick, to just over the middle of the sidewalk, where it goes down the backs of the necks of the unwary passers-by.

In walking through Arequipa you might get the idea that the city was full of burglars. Every house faces the sidewalk and every window is covered with iron bars. The houses themselves look like fortresses and the locks on the doors are of mammoth size. The barred windows and locked doors are not for the burglars. They are not to keep thieves out, but to cage the girls in. The windows have seats behind the bars, but no Peruvian beau stops to chat at these with his lady love. The bars of iron are as thick as your finger and so close together that the most ardent lips could not meet between them. This seclusion of the women by the Spanish people is probably a relic of their admixture with the Moors centuries ago. The wrapping up of the heads in black clothes was originally so done that only one eye showed out. It was worse than the veils of Egypt or Constantinople. Now the whole face is displayed and many of the better class girls wear hats. A Peruvian parent, however, never lets his girls go out alone upon the street. There are no moonlight drives and walks with lovers here and when you call upon your sweetheart you have to entertain the whole family, and if you go with your girl to the hull fight, you take mamma, papa, auntie and old maid sissy with you.

The most interesting thing in Arequipa, however, is the Harvard College observatory. Just about twenty years ago Uriah H. Borden died and left \$200,000 to Harvard College with the understanding that the money was to be used to establish an observatory at the very best place that could be found in the whole world for study of the stars and meteorological conditions. The college authorities first tried points in Colorado and California and then sent an expedition to South America. This expedition first established a sta-

tion 6,600 feet above the sea in the Andes back of Lima, on what is now called Mt. Harvard. In 1890 they changed the station to Arequipa and have since made this one of the great scientific centers of the world. Arequipa is 7,550 feet above the sea and it has more clear days and nights, it is said, than any other place on earth. There are about nine months of the year there when the sky is perfectly clear. You people who pride yourselves on beautiful skies and glorious sunsets will not know what the words mean until you have visited South America. These are especially fine at Arequipa, which has in addition the advantage of being south of the equator at one of the best points for viewing the southern heavens.

There is, you know, nothing duplicated in the sky, and there are here wonderful stars and constellations which we never see. The milky way south of the equator is far more brilliant than it is in our heavens, and there are many other different stars with different movements. You have all heard of the Southern Cross, which my friend, Dr. Talmage, says looks to him like the handwriting of God on the face of the sky. I don't think much of it. It is a measly cross at best. There are only four stars in it, that are not at all bright, and you have to look hard to find them. There are, however, wonderful things outside of this, and the best observations so far made in recent years of the southern heavens have been made by these Harvard scientists. They have four great telescopes at Arequipa, which night after night through the nine clear months of the year are pointed at the stars. Connected with each of these telescopes is a photographic apparatus which records the movements of such stars as the scientists wish to study, and which by fine machinery move along with the stars until their images and those of their surroundings are registered on the photographic plate. The Bruce telescope, for instance, is, I believe, the largest of its kind in the world, though I am not sure of this. It has a lens 24 inches in diameter and gives photographs on plates 14 by 17 inches in size. I took a look through the Bruce telescope during my visit to the observatory. The tube of the instrument must weigh more than a ton, but it is so delicately hung that a child could move it. It runs by a clock and a heavy weight. The chief part of the work done at the observatory is photographing the heavens. Five photographic instruments are kept going, and about fifty plates are made every night. Last year more than five thousand plates were exposed and developed. The negatives are shipped at once to the University of Harvard at Cambridge and are there used for study and scientific work. They are kept on file there and form a wonderful astronomical library of the southern heavens. Through this observatory Harvard College has the best advantages of the world for astronomical research. The scientists of Cambridge are always watching the northern heavens, but they cannot see much below the equator. The Arequipa observatory takes in the whole sky from the equator to the South Pole, the two giving a complete view of the heavens.

Within the last few years the Arequipa astronomers here have established a station on the top of Mount Misti. This mountain is one of the highest of the Andes. It lies just back of Arequipa, standing out against the horizon almost alone in its grandeur, its top kissing the sky at an altitude of 19,200 feet above the sea. It is some thousands of feet higher than any point in America, and is a full mile higher than our observatory on Pike's Peak.

It is by more than 3,500 feet loftier than any other scientific station of the world. The site of the station is on the edge of a huge crater, which now and then sends clouds of yellow sulphurous vapor a thousand feet into the air. Mount Misti is an extinct volcano, but it is not dead, and it may at any time break out into eruption. At this great altitude, nearly four miles above the sea, the Harvard men have now the finest of scientific instruments for registering the conditions of the atmosphere, the velocity of the winds, the pressure of the barometer and other conditions. The instruments are of course automatic, running for three months without being touched. No one could live at such an altitude, and the scientists go up only periodically to get the records and rewind the instruments. As it is the trip is a very hard one. Some of the men get soroche or mountain sickness, and many men cannot make the trip at all. The observatory has other stations on the sea near Mollende, on the high plateau where I now am, and at Cuzco, the famed capital of the Incas, which is a little more than 100 miles from Lake Titicaca. The founding of this wonderful work was done by Prof. W. H. Pickering and Solon I. Bailey of Harvard, the most of the stations being established by the latter. Prof. Bailey has just returned to the United States, and the observatory and its stations are now in charge of Mr. W. B. Clymer of Ohio and Mr. De Lisle Stewart of Minnesota. These young astronomers have contracts to remain here for five years. The position is not a bad one by any means. The observatory is situated 500 feet above the city of Arequipa, overlooking the irrigated valley of the Chile river, which produces the richest of crops the year round. The home of the observatory is most comfortable, one of its chief attractions being Mrs. Stewart's little blue-eyed baby a few months old, born in Peru, which is as pretty and as healthy as any baby you will find north of the equator.

There are three mountains back of Arequipa which are higher than any point in the United States outside of Alaska. Mount Charcani is higher than Mount Misti, and as you leave the desert and ascend to the lofty plateau you get a glimpse of Corupuno, which is 22,900 feet above the sea. Mount Misti's snowy summit is in sight for hours, and I watched the fleecy clouds flying about and below it, sitting in my overcoat on the rear platform of the car. We left Arequipa in the early morning, and at 11 o'clock stopped at the station of Punta de Arrieros for breakfast. This station is more than two and a half miles above the sea. It consists of a few stone huts thatched with straw, and a one-story wooden building made of pine which I doubt not was shipped here from Oregon. There was a bar at one end of the dining room, presided over by a fat Peruvian girl, and at the other end were the breakfast tables. The meal cost about 50 cents of our money, and it was as good as any fifty-cent meal you can get in the Rockies. First there was chicken soup with rice, then codfish balls well browned, then boiled beef and green peas, beefsteak spiced with a sauce of onions and red pepper, a sweet omelet and a cup of very good tea. After the meal I bought four clingstone peaches of an Indian girl for two cents and three oranges for a nickel. These eatables, however, all came from the irrigated valleys or the lowlands. On the high plateau over which we traveled there was only a scanty fuzzy growth of moss-like grass. There was not a tree, and only here and there, about a little mud hut, a patch or so of potatoes, some barley—which is grown only for forage, as it will not ripen at this