

It is a generally known fact that on account of its friction with the ground, and the varying configuration of the earth's surface, the wind is subject to constant changes in its structure. In the troposphere, which reaches an altitude of 9—11,000 meters, periodical changes take place both with the seasons and during the different hours of the day. In the stratosphere, comprising the region between 11 and 18,000 meters, the west wind prevails, as the air is stiller here than at atmospheric levels nearer the earth, while the earth itself moves eastwards. Such conditions are prevalent in the region of the trade-winds, and since the vast desert tracts of Central Asia through which our caravans were travelling have the same latitudes as the trade-winds we were greatly interested to observe whether the same laws in the higher atmospheric levels apply for these continental spaces as those which have been established for the regions over the ocean. We were thus engaged upon a problem with ramifications over the whole globe.

At the equator the air becomes hot and must thus rise. Cloud-formation and copious rainfall are the results. At 30—45° latitude north of the equator the masses of air sink again and reach the earth dry. We therefore find throughout the whole of Asia belts of desert within these latitudes.

By means of the pilot-balloons we intended to find out by what channels the exchange of air between the pole and the equator takes place over the earth's widest expanse of land. The pilot-balloons not only give one information as to the direction of the wind in the higher regions, they also indicate the changes in the distribution of the atmospheric pressure at different altitudes over the surface of the earth.

During the month of June Dr HAUDE sent up forty-nine pilot-balloons. This meant sending up generally two balloons a day, between 6 and 8 a. m. and between 5 and 7 p. m. Some of them burst at different heights, as a rule at 2000 meters over the camp. Three of them exploded in the tent where the filling took place. They were released both in clear weather and when the sky was overcast. From the beginning of July only one balloon was sent up daily, in the morning.

The mean height for the first month was 7500 meters above sea-level; the maximum height was 14,700 meters.

The pilot-balloons that are sent up from vessels are a good deal larger than ours. We had three sizes, but even the largest were too small to be observed distinctly above a height of fifteen kilometers. These balloons are made of yellow or red rubber. The little ones have a diameter of about 75 cm., while the larger ones are 120 cm. in diameter. The former are 30 gr. in weight and must be able to carry 80—90 gr. before they are released. The large ones weigh 110 gr. and must be capable of carrying 325 gr. The little ones have an upward drift of 150 meters a minute, the larger ones of 250 meters.

When filling balloons one opens the main valve at the top of a gas-cylinder, and the current of gas through the rubber pipe is regulated with another valve. The