later instants when the pressure has decreased to small values, the discharge again appears to be outlined exactly as it was before the shot was fired. In the beginning of this work, in the discussion of the use of schlieren methods, it was shown that, with the photographic methods used, every darkening in the schlieren image corresponded to an air compression, and every brightening to an air expansion. Therefore, we have on our photographs, soon after the bullet has left the barrel, a strong compression of the expelled gas particles, which at first increases and then some time later is transformed into an air expansion. Hence there occurs a negative pressure in the discharge whose presence has already been established experimentally by one of us. If down feathers or tow (coarse and broken part of flax, hemp, or jute ready for spinning) are piled up in the first part of the bullet path all the way up to the muzzle, and the shot is fired, then the light, moving pile is seen to progress back toward the muzzle. After the shot, the muzzle is covered and individual down feather particles or tow threads are drawn into the muzzle. With this result, the sequence of density variations observed by us in the discharge, now are entirely harmonized. Also, stereoscopic photographs of the flow pattern, which we have made by using two spark gaps placed together, likewise reveal the existence of a rarefaction in the discharge. These stereoscopic pictures in addition show the compression pattern as an approximately oval surface, and transparent as glass. In the inside, the air striae present there appear to be freely suspended, so that an extremely delicate and beautiful form is seen. A similar flow figure has been obtained by Günther and Külp with foreground illumination and stereoscopic photographs.

We now come to the results of measurement of the pressure variation in the outflowing gases. As already pointed out above, the migration velocity of the principal compression line perpendicular to the bore-axis is a measure of the course of the pressure variation in the discharge. It is, however, not possible to calculate the absolute pressure from the distance to the compression line without further data. For low pressures and continuous flow of gases, in the case of which there occurs, because of elasticity, a wave structure in the surrounding air of such a