At present it is generally recognized that a gastroscopy gives a detailed visual representation of the state of the internal surface of the stomach. It permits one to observe the color of the mucosa and the presence of a tumor, a polyp, or an ulcer [1-6].

A gastroscopic biopsy significantly aids diagnosis and gives a histological picture of the pathological development of the stomach mucosa. The use of gastrobiopsy is especially required in precancerous states of the stomach mucosa, for histological pinpointing of the character of a tumor and cancerous regeneration of polype and callous ulcers, and in several forms of chronic gastritis [7, 8].

There are two methods of gastrobiopsy. One, developed by Benedict [9], consists of a biopsy of a tumorous tissue or mucous membrane of the stomach with the help of cup-shaped forceps, mounted in the gastroscope. Using this, the operator removes a piece of tissue for histological investigation while observing through the gastroscope. A visual gastrobiopsy is performed abroad by a method of suction using commercial apparatus.

In the USSR, instruments of this type were proposed by P. A. Kanishchev, Yu. S. Silaev [10, 11], et al., but they have not been produced by industry. *

The second method consists of suctioning and cutting a small piece of the stomach's mucous membrane with a special probe which was first proposed by Wood [12]. In this method the biopsy is obtained blindly, and only an x-ray investigation offers the possibility of determining in which section of the stomach the probe is located. Tomenius, M. G. Khanin, et al. [13-15] are collaborating on the visual aspiration of the gastrobiopsy.

We constructed a biopsy attachment and attached it to the "Red Guard" Union gastroscope. The biopsy attachment with a sealing capsule has a rigid proximal and a flexible distal part. The attachment is connected to the gastroscope so that the point of connection and the elevator are located beneath the rubber sheath and do not create additional obstacles or dangers in the introduction and extraction of the apparatus. The proximal end of the attachment consists of a screw for controlling the elevator and the sealing capsule (Fig. 1). The latter is an important detail of the gastrobioscope, insuring the hermetic seal of the apparatus, which is a necessary condition for a gastroscopy and bioscopy.

The capsule consists of clamp and valve nuts, a rubber diaphragm, a sealing ring, the body, a valve, and a connecting tube.

The cavity seal is guaranteed by the rubber diaphragm placed between the clamp nut, the valve nut, and the cantilever valve, which is closed by a spiral spring at the mount of the valve joint. The diaphragm insures the seal during the introduction of forceps into the cavity, the positioning of the forceps in the cavity, and their withdrawal from the cavity. The valve insures the seal in the absence of forceps in the cavity.

This valve is lacking in the operating gastroscopes of P. A. Kanishchev, Yu. S. Silaev, and Benedict, and likewise in the Japanese fibroscope, as a consequence of which the air blown into the stomach through

*A biopsy gastroscope of this type was developed by the All-Union Scientific-Research Institute of Medical Instrumentation and is distributed at present by the Leningrad "Red Guard" Production Union.
the biopsy channel is returned to the atmosphere. Thus the stomach contracts, which hinders the performance of the gastrobiopsy. The sealing capsule used by us completely eliminates this shortcoming.

In Fig. 2 is shown an assembled instrument in operating position with raised forceps. The distal end of the rubber sheath and the fixating threads are covered by a fine layer of polyvinyl acetate glue, which guarantees ease of the apparatus' advancement through the cavity. A biopsy by a gastroscope of the described construction proceeds by the customary method.

In addition we constructed a probe for an aspirated gastrobiopsy. It was constructed on the principle of the probe by Wood. The apparatus (Fig. 3) consists of a spiral enclosed in a duodenal probe, on the distal part of which a biopsy capsule with an external diameter of 6 mm is fastened. A 2.5-mm-diameter opening was made in the side of the capsule for aspiration of the mucous membrane.

An essential detail of the probe is the knife. It consists of cutting and guiding parts. The latter guarantees the movement of the knife inside the capsule exactly through the mouth and prevents blunting of the knife's cutting edge. The proximal part of the apparatus is joined in a T-joint, which at operating time is connected with an electrical suction pump from the "Red Guard" Union. The cock in the T-joint allows exact manometric and chronological control due to a negative pressure in the process of taking the biopsy. The probe is used in the customary way. The biopsy is taken without anesthetic. The position of the capsule in the stomach is determined by x-rays. After introducing the probe into the stomach cavity to the required depth, its proximal end is connected with the apparatus through a T-joint with the aspirator. The biopsy aperture in the capsule is opened by a displacement of the knife in the distal direction, and a negative pressure of 250-300 mm is created in 2 sec. A part of the mucous membrane is drawn into the capsule aperture and cut off.

We used the biopsy stomach probe for diffuse stomach illnesses, and the gastroscope with a biopsy attachment for both localized (cancer, ulcer, polyp) and diffuse illnesses.

The 40 gastrobiopsies we performed under visual control and the eight aspirated biopsies showed satisfactory results and an absence of complications. All tissue samples were adequate for histological investigation.