the U. G. C. for a fellowship to V. R. R. and to the C. S. I. R. for a research grant to A. N. N.

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A FIRST REPORT OF THE SYSTEMIC VALVE IN THE TRUNCUS ARTERIOSUS OF THE INDIAN FROG *RANA TIGERINA* (DAUD)

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THIS author[1] had earlier reported the presence of septum principale and the septum mediale in the truncus arteriosus of the frog *Rana tigerina*. Later the same author[2] reported the presence of a chondrioidal cardiac skeleton in the heart of the same species of frog. Since then several details of the truncus arteriosus have been worked out. This note is aimed to report the presence of a systemic valve in the same species of the frog and its possible role in the distribution of blood through the truncus arteriosus.

Systemic valve was first observed in a dissection of the truncus from the dorsal side, then confirmed through microtome sections of the truncus (figures 1, 2, & 3). The name was coined by this author because the valve was placed in the right systemo-carotid channel of the truncus. It is in the form of an obliquely placed muscular ring quite close to the septum principale and like the latter the systemic valve has its origin-base in the septum trunci (the horizontal septum dividing the pulmocutaneous channel from the systemo-carotid channel). The valve is about 350 μ away on the right side of the septum principale. Thus hanging freely from the septum trunci, the systemic valve stands as a 'collapsible door' between the right half of the systemo-carotid channel and the right systemic arch. For about 500 μ the systemic valve extends anteriorly into the right systemic arch. This is established from the fact that the tip of the valve begins to show up ahead of the base in serial microtome sections. The base of the valve is about 250 μ across and the valve itself is about 400 μ long. Barring the tip of the valve, the remaining distal part of the valve is merged in the ventral wall of the truncus. In the middle of the valve is a longitudinal lumen (figure 3) operated by strongly developed muscles around it. A thin endothelium covers the surface of the valve. Between the muscles and the covering endothelium is a thick coat of fibrous tissue.

Figure 1. Photograph of the dissection of the truncus of *Rana tigerina* showing the systemic valve (marked by an arrow) from dorsal × 150.

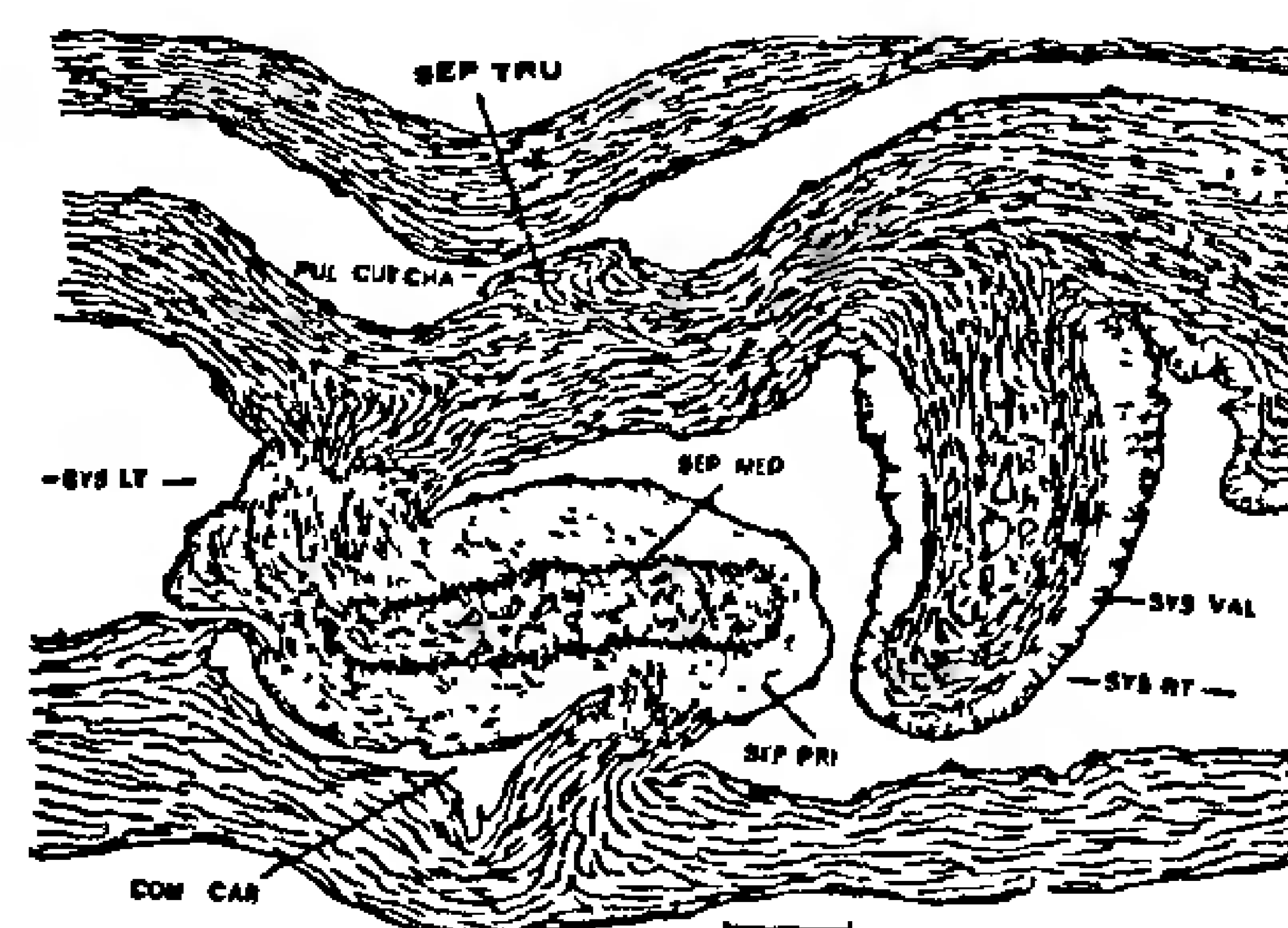

Figure 2. Transverse section of the truncus of *R. tigerina* through the septum principale and the systemic valve. *sys. lt.* left systemic arch; *com. car.* part of the ventral aorta leading into the common carotids; *sep. pri.* septum principale; *sep. med.* septum mediale; *sep. tru.* septum trunci; *sys. rt.* right systemic arch; *sys. val.* systemic valve; *pul.cut.cha.* pulmocutaneous channel.

The spiral valve in the conus of the frog's heart, to a certain extent, helps to keep the less-oxygenated blood from the right atrium and the well-oxygenated blood from the left atrium separated inside the conus. The position of the conus arising from the right dorsal side of the ventricle and its spiral twisting is such that upon ventricular systole, nearly all the less oxygenated blood finds its way into the cavum pulmocutaneum.

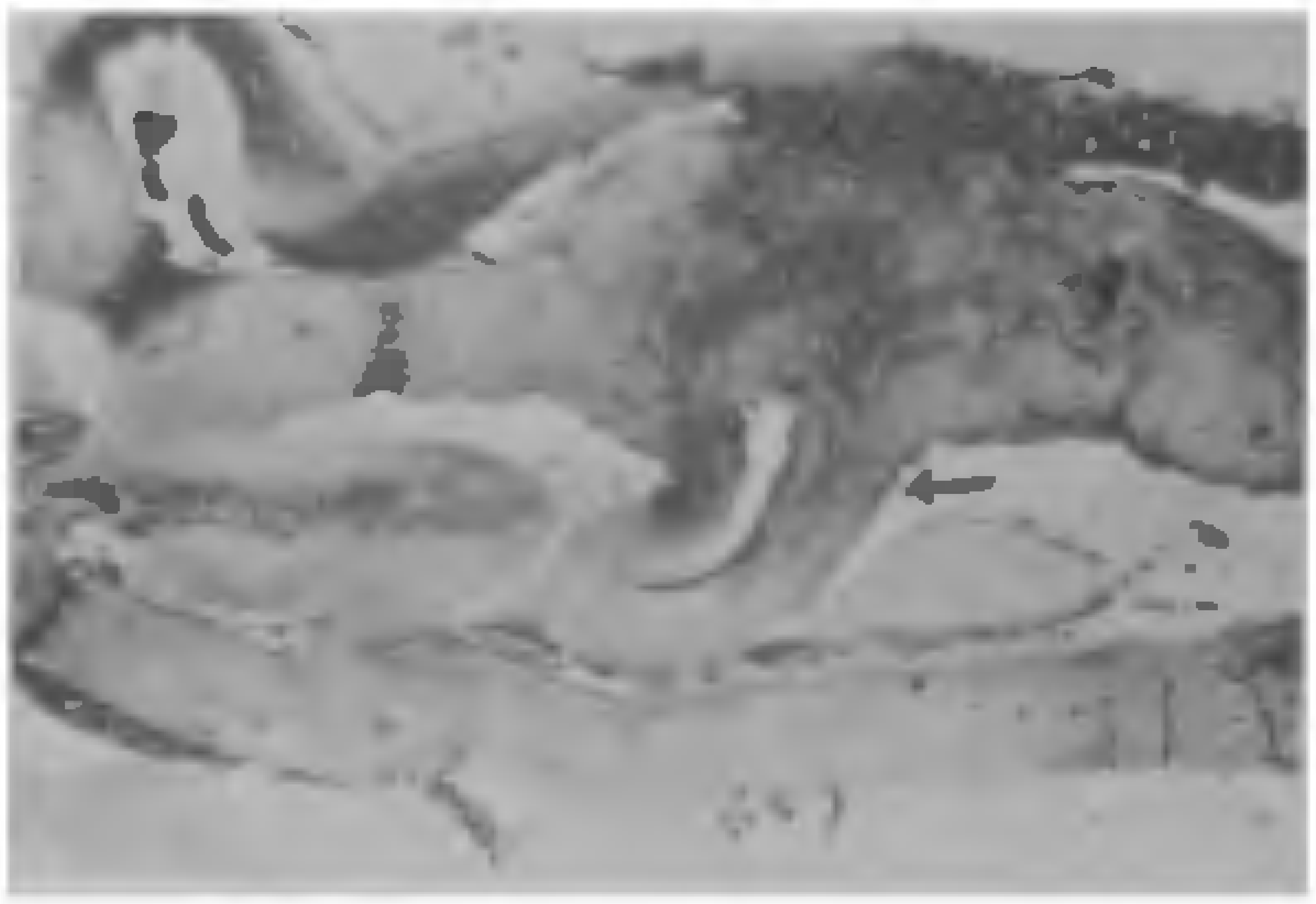

Figure 3. Photomicrograph of the T. S. of truncus of *R. tigerina* through septum principle, septum mediale and the systemic valve with its lumen. × 150.

Entry of the well-oxygenated and some mixed blood into the cavum aorticum of the conus is delayed slightly (0·4 seconds) during which the spiral valve changes its position, then allows a free passage of blood into the cavum aorticum.

In the first phase of conal systole the less-oxygenated blood of the cavum pulmocutaneum passes into the pulmocutaneous channel and further into the pulmocutaneous arches. Just how the well-oxygenated and mixed blood of the cavum aorticum of the conus is prevented from entering the systemo-carotid channel during the first phase of conal systole, is suggested as follows.

While less-oxygenated blood is filling the pulmocutaneous channel above the septum principale, the inflated pul. cut channel presses on the septum trunci and the septum principale causing the septum mediale to move down and become applied tightly against the ventral wall of the truncus with its terminal disc. This contact of the disc of septum mediale, howsoever short-lived, makes a functional and effective blocking of the communication not only between the left and right sides of the systemo-carotid channel, but also between the cavum aorticum and the systemo-carotid channel. Thus the carotid and systemic arches do not receive blood in the first phase of conal systole. Entry of blood into the right systemic arch is further blocked by the closure of the lumen of the systemic valve by its own muscles. Only after the less-oxygenated blood has passed on into the pulmocutaneous arches, the muscles of the systemic valve are relaxed, its lumen is opened, the septum trunci, septum principale and septum mediale retrace to their original positions, the blockade of the communications referred to above is lifted, blood of the cavum aorticum is pressed into the systemo-carotid channel from where it is sent into the carotid and systemic arches of both sides. The said changes are preparatory to the second phase of the conal systole.

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ANNOUNCEMENT

ALL INDIA SYMPOSIUM ON PHYSIOLOGICAL RESPONSES OF ANIMALS TO POLLUTANTS
9–11 December 1982

The tremendous growth of chemical industry gives rise to a number of pollution problems. The pollutants discharged from chemical industry can cuase death of fish and various invertebrates due to concentration of free ammonia and eutrophication. This symposium sponsored by UGC will be organised in the Department of Zoology, Marathwada University, Aurangabad, to highlight some recent advances in the studies on the physiological effects of pollutants on various animals. The following aspects are selected for discussion at the symposium: (1) Behavioural responses of animals to various pollutants; (2) Effects of pollutants on the development; (3) Metobolic changes associated with pollution; (4) Pollution hazards on reproduction and growth; (5) Effects of pollutants on neuroendocrine system.

The abstracts of the papers to be presented and other enquiries should be sent to Prof. R. Nagabhushanan, Department of Zoology, Marathawada University, Aurangabad–431 004, before 30th June 1982.