My grateful thanks are due to Rao Bahadur B. Viswanath and Dr. B. P. Pal, for many helpful criticisms and valuable suggestions.

Imperial Agricultural Research Institute, New Delhi, *September* 29, 1943. ABHISWAR SEN.

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ABNORMAL CIRCULATION IN THE COMMON INDIAN FROG *RANA TIGRINA* DAUD.

ABNORMALITIES in the circulatory system of Anura are numerous. Those in the common European frog *Rana temporaria* have been reported by Crawshay (1906), Collinge (1915), Flattely (1926), Lloyd (1928), Grove and Newell (1934) and O'Donoghue (1932, 1933, 1935). A number of Indian workers (Ahuja, 1921; Bhaduri, 1929 *a* and *b*; Khatib Husain, 1938; Mathur and Sharma, 1938) have described abnormalities in the vascular system in *Rana tigrina*.

I have found the following abnormalities in a female specimen of *Rana tigrina*:—

I. *Venous abnormalities.*—(1) A persistent right posterior cardinal vein joining the innominate vein on the right side and the absence of the post-caval vein. (2) The presence of two dorso-lumbar veins on each side joining the renal portal veins.

II. *Arterial abnormality.*—An additional arterial branch arising from the Carotid arch.

Venous Abnormalities.—The absence of the post-caval and the persistence of the right posterior cardinal.

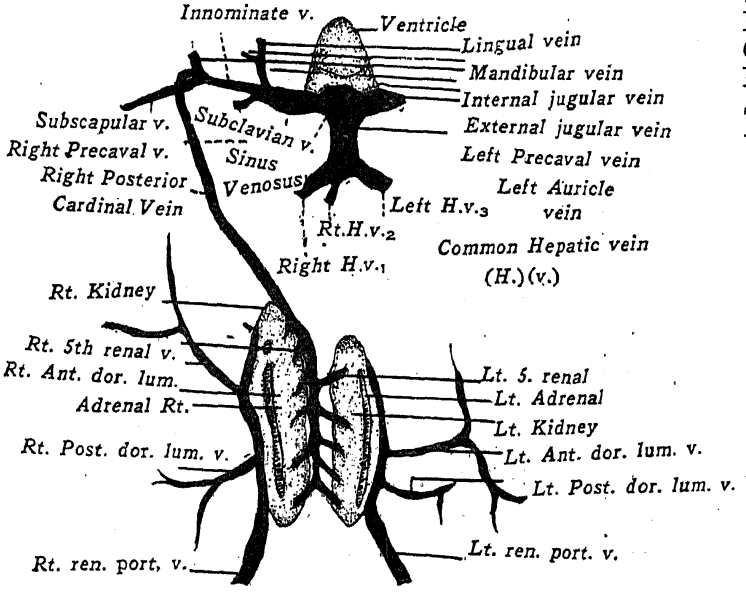
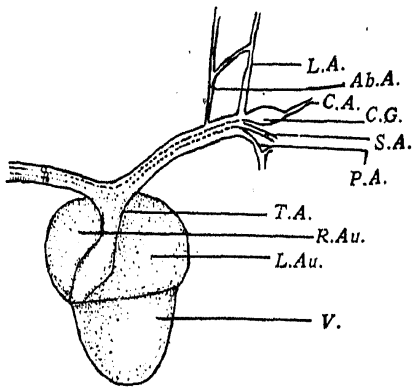


FIG. 1 ×·5

Rt. Ant. dor. lum., Anterior dorso-lumbar vein; *Rt.*, Right; *Lt.*, Left; *Rt. ren. port. v.*, Right renal portal vein; *Rt. Post. dor. lum. v.*, Right posterior dorso-lumbar vein; *Lt. ren. port. v.*, Left renal portal vein.

Fig. 1 illustrates the venous abnormalities. The post-caval is replaced by the persistent right posterior cardinal. The kidneys are dissimilar in size and the renal veins of the right side are more in number than those on the left side correlated with the larger size of the right kidney. The presence of two dorso-lumbar veins is also seen. So far as the veins from the liver are concerned, two hepatic veins arise from the right lobe of the liver while only one arises from the left. All these fuse to form a single hepatic vein which opens directly into the sinus venosus since the post-caval is absent.

Arterial Abnormality.—This is interesting since arterial abnormalities occur far less frequently than venous ones. The left Carotid arch gives origin to an abnormal artery before the point of origin of the lingual artery. It gives off two branches, one of which joins the lingual artery while the other supplies certain muscles (Fig. 2).



The ventral view of the heart showing only the left aortic arches.

FIG. 2 ×·75

Ab.A., Abnormal artery; *C.A.*, Carotid artery; *C.G.*, *Carotid Gland*; *L.A.*, Lingual artery; *L.Au.*, Left Auricle, *P.A.*, Pulmocutaneous arch; *S.A.*, Systemic arch; *T.A.*, Truncus arteriosus; *R.Au.*, Right auricle, *V.*, ventricle.

My best thanks are due to my colleagues and also to Principal Dr. K. Krishnamurti for their advice and encouragement.

Department of Zoology, College of Science, Nagpur, *September* 7, 1943. THAKUR S. B. SINGH.

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A NEW VARIETY OF *DROSERA INDICA* LINN. FROM KOLHAPUR (S.M.C.)

IN an intensive study of the flora of Kolhapur (Deccan) three types of the insectivorous plant, *Drosera* are met with. Two of these are the commoner species, *Drosera indica* Linn. and *Drosera Burmanni* Vahl., already described. Cook[1] mentions a few localities from the

Bombay Presidency where these are found naturally, but not Kolhapur. Roxburgh[4] refers to them as natives of Coromandel, Ceylon, etc. Their occurrence, therefore, in Kolhapur is interesting from point of view of their distribution.

Drosera Burmanni Vahl. was collected at Radhanagari hills (a place of heavy rainfall) while *Drosera indica* Linn. was found at Katyayani hills (with much less rainfall), in marshy places.

A third variety of *Drosera*, also collected in a marsh near Gokulshirgaon—very near to the city, differs from *Drosera indica* Linn. in possessing red flowers instead of the usual white ones, while it agrees in other characters very closely. It also flowers in September.

This third type appears, therefore, to be a distinct variety of *Drosera indica* Linn., not recorded by Cook.[1] This may not be the same as that referred by I. Pfleiderer[3] and V. Mayuranathan[2] as having "pinkish" flowers.

The following new nomenclature is, therefore, proposed:—

Flowers white ..... *Drosera indica* Linn. var. *alba*.

Flowers red ..... *Drosera indica* Linn. var. *rubra* Parandekar et Diwan.

Biology Department,
Rajaram College,
Kolhapur,
September 16, 1943.

S. A. Parandekar.
M. G. Diwan.

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PRODUCTION OF ELEMENTARY SULPHUR BY REDUCTION OF SULPHATE THROUGH BACTERIAL AGENCY

In the course of investigations on microbiology of some anaerobic bacteria at the Imperial Agricultural Research Institute, New Delhi, an organism, which reduces sulphate to elementary sulphur, has been isolated both from soil collected from the bottom of an irrigation channel and materials from the anaerobic fuel gas plant set up at the chemical laboratory. Although the reduction of sulphates to sulphides in the presence of organic matters has been known for a long time, no mention has been made in literature of any organism producing elementary sulphur by reduction of sulphate. The organism appears to be a new one of the kind as is evident from the morphological characteristics and biochemical tests. The organism is a gram negative, non-spore forming short rod. It grows in Dunham's solution in the presence of sucrose, lactose, maltose, raffinose, levulose, mannite, salicine, and glycerine with no gas and acid. The organism ferments glucose with production of gas and acid and reduces nitrate to nitrite and ammonia. It neither curdles nor peptonises milk. It does not reduce litmus milk. The organism grows well in Van Delden's lactate asparagine liquid medium of the following composition:— K_2HPO_4 0·5 gm., Sodium lactate 5·0 gm., Asparagine 1·0 gm., $MgSO_4$ or $CaSO_4$ 1·0 gm., $FeSO_4$ Traces, and Tap water 1,000 c.c. In this medium about 30-35 per cent. of sulphur present in calcium sulphate is reduced to crude elementary sulphur in about a week's time. For the estimation of crude elementary sulphur 50 c.c. of the inoculated culture medium were evaporated to dryness on water-bath. The dried mass was treated with carbon disulphide and then filtered on a tared porcelain dish. The carbon disulphide was then evaporated to dryness. The substance extracted by carbon disulphide was then weighed as crude elementary sulphur. Further test for sulphur was made by oxidising it with nitric acid and precipitating the sulphate with barium chloride.

The production of hydrogen sulphide could not be detected at any stage as no blackening of lead acetate paper occurred during the course of reduction.

The possibility of this organism producing sulphur from sulphate by composting with organic matter is being studied. A paper on the subject will be published later.

Imperial Agricultural
Research Institute,
New Delhi,
September 15, 1943.

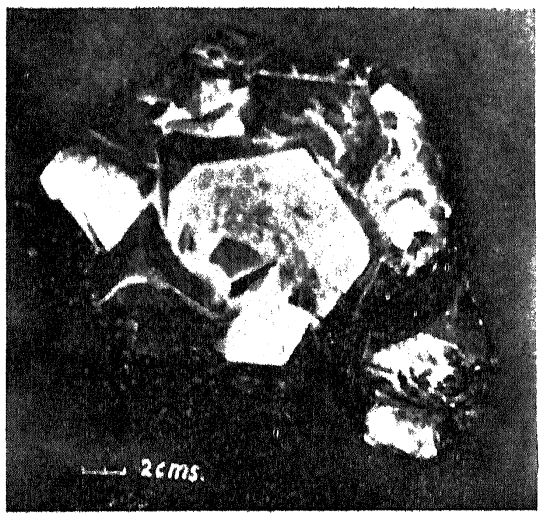
S. C. Datta.

PYRITE CRYSTALS FROM THE ALMORA DISTRICT, UNITED PROVINCES

Pyrite is a widely distributed mineral and occurs in formations of various ages, and its crystals are quite common. However, on account of the large size of the crystals the above occurrence is worthy of record.

The crystals occur in greenish schistose phyllites at two localities, Chowkoree (29° 50·5′: 80° ·2′) and near the bank of Sarju river E.N.E. of Khani (29° 47′: 70° 47·5′).

From the former locality the crystals are cubes, which are somewhat distorted and show



a pseudo-tetragonal symmetry. The edges of the largest crystal measure 19 mm. One of the crystals showing the pseudo-tetragonal symmetry can be seen towards the right in the photograph.