Pericline- and Complex Albite-Carlsbad law. A few untwinned laths however exhibit zoning and a variolitic pattern in distribution. The anorthite content (55–70%) indicates that it is labradorite. It is optically positive, with $+2V = 80°–90°$.

The modal composition of the coarse textured portion determined on Shand's 6-Spindle integrating stage shows : Olivine 5·7% ; enstatite 55·65% ; plagioclase 34·9% ; biotite 2·67% and iron ore 3·08%.

In thin sections, the chilled margin of the dyke exhibits a porphyritic texture. wherein a few bigger euhedral and marginally corroded grains of pyroxene and olivine occur as phenocrysts in a fine matrix (Fig. 2), but the central

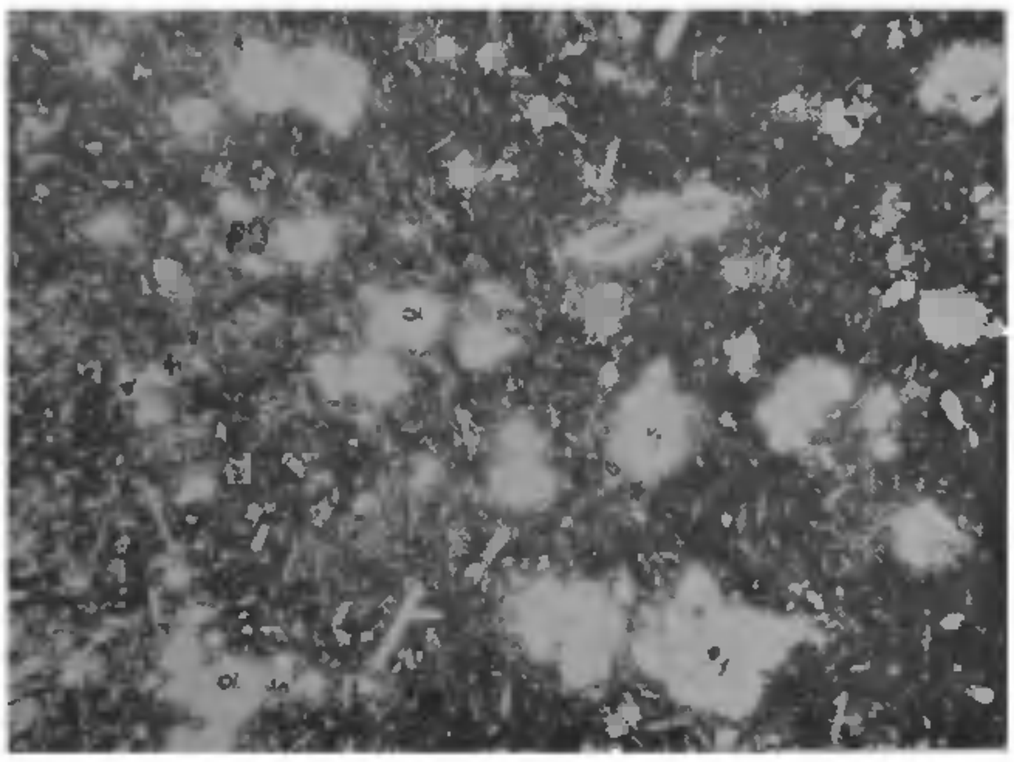

FIG. 2. Phenocrysts of olivine (*ol*) and pyroxene (*px*) in a fine-grained matrix. Plane polarized light, × 18.

portion shows a typical panidiomorphic texture, wherein euhedral grains of olivine and pyroxene are embedded in a ground mass of fine granular pyroxene and lath-shaped plagioclase (Fig. 3).

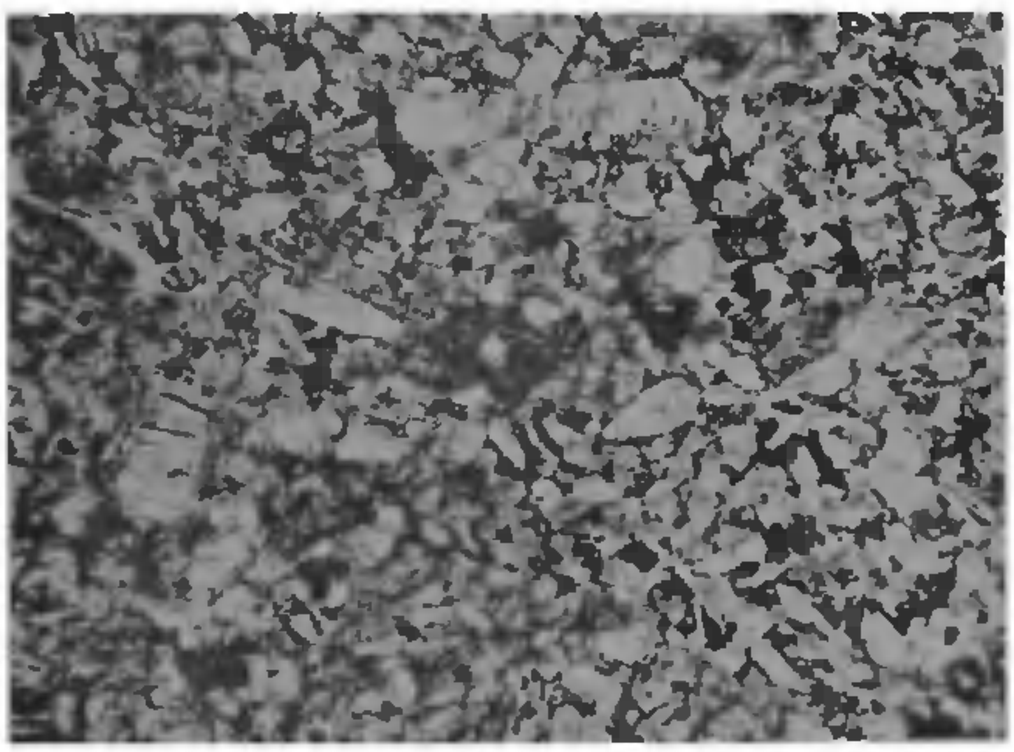

FIG. 3. Panidiomorphic texture from the core of the dyke. Plane polarized light. × 18.

Based on the mineralogical and textural characteristics the dyke under investigation may be called a camptonitic lamprophyre following the descriptions of Grout (1932) and Bowen (1928).

Absence of well-developed rectangular laths of plagioclase feldspar in the chilled margins indicates that this dyke has intruded the granite, before the complete development of plagioclase feldspar, as suggested by Ramsay (1955). Further, the dyke might have resulted by the injection of crystals of olivine and pyroxene into an alkalic liquid as observed by Jaffe (1953) in the case of Camptonites of Mount Jo.

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ON THE ABNORMAL GENITAL SYSTEM IN THE LEECH *HIRUDINARIA GRANULOSA* (SAVIGNY)

DURING a study on the Indian cattle leech *Hirudinaria granulosa* (Savigny), a very unique and abnormal genital system was observed. Relatively few reports have appeared in the literature concerning the abnormalities in leeches. Moore (1927) has mentioned variations in the sensillæ, whereas Bhatia (1938) has described the variations in the number of sensillæ and eyes, the posterior sucker, the structure of the crop, the variable number of testes and the extension of vas deferens in testesless segments where they have no function. The abnormalities in the genital system of this species seem to be unobserved so far. specially the development of double vagina and the association of male and female gonads in one and the same segment. Considering this case to be a unique one, an attempt has been made to record it here.

Typically in this species (Bhatia, 1941), the epididymes are paired and contained in segment X. Their ejaculatory ducts open in the atrium. First pair of testes lies in segment XII. Vas deferens run forward from segment XXII to segment XI where they abruptly enlarge to

form two closely convoluted and compact masses, the sperm vesicles or epididymes. The paired ovaries are contained in the ovisacs in segment XI, their oviducts leading to the vagina after uniting into a common oviduct. The vagina lies in the posterior part of segment XI.

The genital system under observation shows extremes of abnormalities. Both the male and female systems of the left side alone are abnormally developed.

The Abnormal Male Genital System.—The epididymis of the left side has descended to segment XI and consequently it receives the vas deferens which commences from segment XXIII instead of from segment XXII. The ejaculatory duct of the descended epididymis has lost all connections with the atrium; instead, passing under the nerve cord it is connected below the albumen gland with the oviduct leading to the normal vagina of the XI segment (Fig. 1 EJD.). The vas deferens

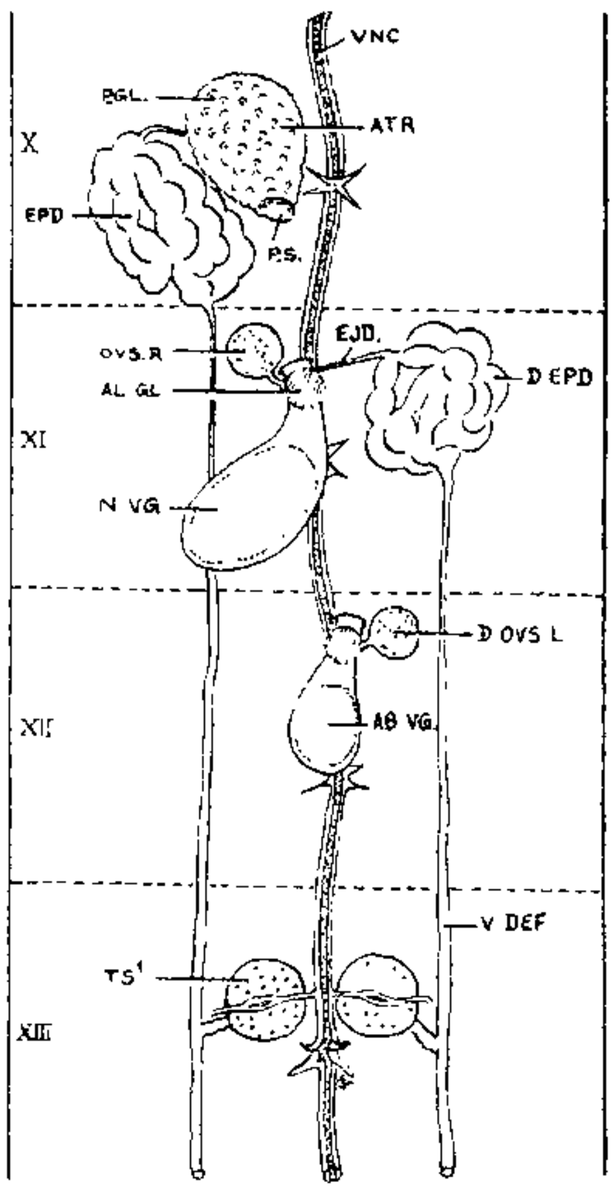

FIG. 1. Semi-diagrammatic sketch of the abnormal genital system in the leech *Hirudinaria granulosa* based on a photograph of the dissection. AB. VG., Abnormal vagina; AL. GL., Albumen gland; ATR., Atrium; D. EPD., Descended epididymis of the left side; D. OVS. L., Descended ovsiac of the left side; EJD., Ejaculatory duct leading to the oviduct of the normal vagian; EPD., Epididymis of the right side; N. VG., Normal vagina; OVS. R., Ovisac of the right side; P. GL., Prostate gland; P. S., Penis-sac; TS.[1], First pair of testes; V. DEF., Vas deferens; VNC, Ventral nerve cord.

of the right side runs normally from segment XXII where lies the tenth pair of testes. The first pair of testes lies in the segment XIII instead of in segment XII; whereas the eleventh testis in segment XXIII is unpaired. The male genital aperture is distinct and normal.

The Abnormal Female Genital System.—The left ovisac has descended one segment, that is, it is in segment XII instead of in segment XI. Its oviduct leads to a new vagina which is nearly half the size of the normal vagina. The development of this double vagina is unique. It opens to the exterior, on the left side of the nerve cord, in a separate female genital aperture, distinctly in the mid-ventral line in the second annuli of segment XIII. Normal vagina has also its distinct female genital aperture on the second annuli of segment XII. Thus there are two very distinct female genital apertures, one each in segment XII and XIII.

The fact, that both the male and female reproductive organs (except the atrium and penis) of the left side are abnormal, and have descended a segment, is sufficient to prove that some strong stimulus led to this abnormal development of genital system in this leech. Since Hirudinea are almost certainly derived from Oligochaeta with paired ovaries and oviducts, it is very interesting to note that the ovaries are not paired here; one is in segment XI and the other is in segment XII. The nerve cord runs between them.

Since leeches are protandrous hermaphrodites and cross-fertilization is the general rule (Mann, 1962) the association of the ejaculatory duct with the oviduct of the normal ovary leads to the possibility of self-fertilization. This is further strengthened by the complete development of the normal ovary and the vagina as well as of the descended epididymis.

The development of another vagina in segment XII, its association with the ovary and its distinct female genital aperture, are other features of interest.

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