



Donkari



AMIYA BHUSON KAR

(1918 – 1976)

Elected Fellow 1969

BIRTH, PARENTAGE AND EDUCATION

AMIYA BHUSON KAR, born on May 6, 1918 in Calcutta, was the second child of late Shri Abani Bhuson Kar and late Smt Prabhavati Kar. His father, a leading advocate at Alipore Criminal Court, Calcutta, had a profound influence in shaping Amiya Bhuson's career. After his school education in Mitra Institution at Bhowanipur, Calcutta he joined the Presidency College, Calcutta from where he obtained his MSc degree in Zoology in 1940. Kar had a brilliant educational career. For securing first position in the first class in BSc (Hons) examination in 1938, he was awarded the Jubilee Scholarship and for MSc a gold medal by the Calcutta University.

Amiya Bhuson was appointed as a lecturer in Bethune College, Calcutta in 1940. In 1944, he was awarded the Sir Rashbehary Ghosh Fellowship of the University of Calcutta for higher studies in UK. He worked with Professor A W Greenwood at the Institute of Animal Genetics, Edinburgh University, Edinburgh, UK, from where he obtained his PhD degree in 1946. He then worked as a Resident Doctor at the Department of Poultry Husbandry, Cornell University, Ithaca, New York, USA for one year (1946-1947). Dr Kar returned to India in late 1947 and joined St Xavier's College, Calcutta as Professor of Biology and Honorary Lecturer in Zoology, University of Calcutta. In 1949, he joined the Central Drugs Laboratory of the Government of India at Calcutta as a Senior Research Fellow of the National Institute of Sciences of India (1949-52). In 1955, Dr Kar went back to England as a Colombo Plan Fellow and worked at the Department of Anatomy, University of Birmingham (1955), Atomic Energy Research Establishment, Harwell (1956) and the Medical Research Council, Radiotherapy Research Unit, and the Hammersmith Hospital, London (1956).

RESEARCH CONTRIBUTIONS

Dr Kar joined the Central Drug Research Institute, Lucknow in 1952 and after serving in various positions was made Eminent Scientist of the CSIR in 1974. The research on development of contraceptives and reproductive biology started with Dr Kar. He was the first head of the Institute's Division



of Endocrinology, which soon developed into a very active school of research in this area and received both national and international recognition.

His research from 1947 to 1951 dealt with the effects of steroids (androgens, estrogens, progestogens and corticoids) on the reproductive process in experimental animals (particularly birds) and showed their antioviulatory and anti-spermatogenic properties. His records show that he initiated these studies as early as 1944 when research in the area of fertility regulation was almost unknown. His studies from 1954 to 1956 demonstrated the mode of action and contraceptive efficacy of 19-norsteroids in animals independently but almost simultaneously with Dr Gregory Pincus in USA. Dr Kar together with his associates then conducted exhaustive studies on the effect of Enovid, the first oral contraceptive, on the physiology and biochemistry of the genital and endocrine organs of rhesus monkeys from birth to sexual maturity, and were able to show the absence of any adverse influence of this contraceptive. They later on demonstrated that the chemical structure of progestational steroids was an important determinant of their *modus operandi*, whether at the hypothalamopituitary or peripheral level. Dr Kar and his colleagues also studied the effect of these steroids, particularly progestogens on male fertility and showed that none of them caused selective arrest of spermatogenesis without inhibiting endocrine function.

Dr Kar was one of the first to investigate the effect of heavy metals (in the late fifties), particularly of cadmium, on reproduction. His studies showed the importance of ionic homeostasis in the maintenance of normal reproductive functions. The practical application of these studies was the development of a simple, inexpensive and bloodless method of sterilisation of scrub cattle by intra-ovarian injection of cadmium chloride. In recognition of his contributions in this field, Dr Kar was invited by the University of Montreal, Canada in 1967 as Claude Bernard Visiting Professor in Experimental Medicine to deliver lectures on the role of metallic ions in reproduction, an assignment, which due to pressure of work he could not fulfil.

From 1960, Dr Kar and his associates conducted extensive experimental and clinical studies on intrauterine contraceptive devices (IUD), with particular emphasis on their long-term effects on the physiology and biochemistry of the genital organs and on the management of IUD-associated bleeding episodes with haemostatics, anti-inflammatory and anti-histaminic agents and progestogens. The pioneering studies of his group on intravas deferens device in 1964 and intra-fallopian tube device in 1966 stimulated wide interest in such devices and subsequent research on vas occlusion techniques with silastic and other polymers was a direct result of this interest generated. For his contributions in the field of IUD he was invited to speak, at the International Conference on Intrauterine Contraception in 1964, organized by



Population Council, New York, USA ; on 'The Mechanism of action of IUDs' at the 8th International Conference on Planned Parenthood, Santiago, Chile in 1967 ; on 'The Effect of IUDs on Implantation' at the National Institute of Health, USA. Conference on Biological Effects of IUD, Bethesda, USA in 1967, and was elected Vice-Chairman, World Health Organization Scientific Group Meeting on IUD, Geneva in 1968.

In 1963, Dr Kar and his group became interested in the development of nonsteroidal post-coital contraceptives for the female. These efforts resulted in the discovery of anti implantation activity in a variety of chemical structures, notably 2, 3-diphenyl-benzofurans, 2, 3-diphenyl-naphthofurans and 3, 4-diphenyl-chromans ; one of the active compounds of latter group, named Centchroman is currently under multicentric clinical trial as a weekly contraceptive pill. Dr Kar's contribution in this field was recognised by the Nobel Foundation, Sweden and he was invited to be a plenary speaker on 'Non-steroidal antifertility agents' in the symposium on Fertility Control held in Stockholm in May, 1970, but he could not accept the invitation on account of other commitments.

In 1973, Dr Kar and his associates initiated work on the development of chemical tubal and vasal occluding agents as a non-surgical method for tubectomy and vasectomy. This has resulted in identification of a number of new active compounds in this area, two of which are now under preclinical evaluation.

Dr Kar made some very noteworthy contributions to basic research in the field of reproductive physiology. His studies on the role of peripheral extragonadal endocrine factors in reproduction and fertility, particularly the thyroid, led to the demonstration of a direct 'thyroprostatic axis', the thyroid hormones being responsible for keeping the prostatic sensitivity to androgen and estrogen within optimal physiological limits. This discovery has important implications on the enigmatic overgrowth and neoplasia of the prostate in old age. His studies on the cause and identification of incipient of the ovarian follicles showed that spontaneous atresia is an autolytic process caused by lysosomal enzymes such as acid phosphatase. The peak rate of follicular atresia is characterised by a sharp drop in acid phosphatase activity. His group could show that during ovum transport in the fallopian tube, lactic acid is involved in ova development and the acid phosphatase activity is probably concerned with post-denudation removal of cumulus and corona cell debris. However, no part of the tube was found to be preferentially sensitive to estrogen, progesterone or their combination.

Dr Kar and his associates also conducted extensive studies on the physiology and biochemistry of the male genital organs. Their studies on the effect of antispermatogenic agents on testicular fluid and isolated seminiferous



tubules established that these agents influence primarily energy producing system and the effect on protein synthesis and steroidogenesis was secondary to this. Their studies on zinc metabolism in the prostate demonstrated that its effect is modulated by sex hormones and this metal may be involved in the stimulation of sperm motility. He was made Chairman of the Session on 'Control of male fertility' at the Second International Congress of Endocrinology, London, 1969.

Dr Kar Published over 350 research papers and reviewed articles in about 60 national and international journals and was a co-author of three World Health Organization monographs. He was a member of the editorial board of (a) Steroids (b) Contraception (c) Indian Journal of Experimental Biology (d) Indian Journal of Pharmacology and (e) Proceedings of the Indian National Science Academy—Series B. He served as Chairman, Vice-Chairman, plenary speaker, discussion leader and discussion moderator of numerous national and international congresses, conferences, symposia and workshops on human reproduction and control of fertility for nearly two decades. He was a research guide and examiner for PhD, MD and MSc degree of about 10 Universities in the country.

MEMBERSHIP

Dr Kar served as Member, Advisory Group and Consultant, Human Reproduction, WHO, Geneva (1964-1974), Vice-Chairman of 3 HRP Scientific Group Meetings (1963-1967, 1968) at WHO, Geneva ; Member, Advisory Group on Scientific Aspects of Family Planning, ICMR, New Delhi (1966-1974) ; Member, Scientific Advisory Board, ICMR (1971-1974) ; Member of the Programme Evaluation and Planning Committee for Family Planning for drafting the 4th and 5th Five-Year Plans of the Ministry of Health and Family Planning, Government of India ; Member, Sectional Committee on Zoology, Indian National Science Academy ; Member, Family Planning Association of India and Pathfinder Fund, India (1969-1974), Member, Biological Research Panel, IPPF, London (1971-1973).

HONOURS AND AWARDS

For his outstanding contributions to biomedical research and family planning, Dr Kar received many honours and awards, which included Dr P N Raju Award of the Indian Council of Medical Research in 1966 ; National Award of the Ministry of Health and Family Planning, Government of India in 1969 ; Federation of Indian Chamber of Commerce and Industry Award in 1971 ; Inventions Promotion Board Award in 1972 and Asiatic Society Gold Medal in 1972. He was elected Fellow of the Indian National Science Academy in 1969. The President of India bestowed on him the Padma Shri in 1971.



Towards the end of 1972, Dr Kar had a paralytic stroke and was bedridden for nearly six months. But he recovered due to his strong will power and resumed his duties. Again in mid-1975, he had an attack of cerebral thrombosis from which he did not recover and breathed his last in Calcutta on January 6, 1976.

Dr Kar, though a hard task-master, was always kind and helpful. He never spared himself from hard work and demanded similar dedication from his students and colleagues. He was married on August 15, 1948 to Geeta Mitra, B A (now deceased) daughter of Shri Dwipendra Nath Mitra and Mrs Lilian Mitra. This biography would be incomplete without a reference to Mrs Geeta Kar, his wife. She was a source of inspiration to him in his academic pursuits and used to remark that Dr Kar was wedded more to his work rather than to her. She predeceased Dr Kar by a couple of months.

The author is grateful to Shri Hiten Mitra, brother-in-law of Dr Kar, for providing informations about his family and early education.

V P KAMBOJ

BIBLIOGRAPHY

1947. Studies on the ligaments of the oviduct in the domestic fowl. *Anat. Rec.*, **97**, 175.
- The action of male and female sex hormones on the adrenals in the fowl. *ibid*, **97**, 551.
 - The hormonal influence in the normal functioning of the uropygial gland in the fowl. *ibid*, **99**, 75.
 - The adrenal cortex—testicular relations in the fowl : the effect of castration and replacement therapy on the adrenal cortex. *ibid*, **99**, 177.
 - The fate of the yolk-stalk in domestic fowl. *Poult. Sci.*, **26**, 108.
 - The development of an occluding plate in the oviduct of the domestic fowl and on certain points in the development of the oviduct. *ibid*, **26**, 262.
 - Responses of the oviduct of immature female fowl to injection of diethylstilbestrol and the mechanism of perforation of the oviduct in the domestic fowl. *ibid*, **26**, 352.
1948. The effect of androgenic treatment on the testis of juvenile pigeons. *Proc. Zool. Soc*, **4**, 376.
- Androgen-induced changes in the sexual organs of a common Indian bird--the spotted munia. *Proc. Zool. Soc. Beng.*, **1**, 81.
 - The persistence of yolk sac in baby chicks due to diethylstilbestrol treatment. *Curr. Sci.*, **17**, 91.
1949. Testicular changes in the juvenile pigeons due to progesterone treatment. *Endocrinology*, **45**, 346.
- Testicular stimulation in the juvenile parakeet due to prolonged androgenic treatment. *Proc. natn. Inst. Sci., India*, **15**, 263.
 - The action of progesterone on the female genital system of juvenile pigeons. *Indian J. Physiol. all. Sci.*, **3**, 16.
 - Genital hypoplasia in the juvenile female pigeon due to androgenic treatment. *Indian Vet. J.*, **26**, 1.



1949. Responses of the genital system of the female Indian spotted munia, *U. punctulata* to estradiol benzoate. *Proc. Zool. Soc. Beng.*, **2**, 1.
- The stimulation of the uropygial gland in the female Indian spotted munia, *U. punctulata* (L) due to estrogen treatment. *Nature*, **164**, 495.
 - In vitro action of estrogen on rabbit coccidian cocysts. *Indian Vet. J.* **25**, 390.
 - The artificial insemination in the fowl. *ibid.* **26**, 1.
1950. (With GHOSH A) Histophysiological changes in the chick thyroid due to diethylstilbestrol treatment. *Indian J. Physiol. all. Sci.*, **2**, 25.
- Studies on the distribution and concentration of alkaline phosphatase in the adrenal cortex of normal and sex hormone treated pigeons. *Endocrinology*, **46**, 363.
 - Alkaline phosphatase in the uropygial gland of normal and androgen treated pigeons *Proc. natn. Inst. Sci. India*, **16**, 41.
 - (With GHOSH A) Responses of the genital system and the urogenital pepilla of the common Indian catfish *H fossilis* to sex hormones. *Arch. Enhomech. Org.*, **144**, 257.
 - Studies in the distribution and concentration of alkaline phosphatase in the ovary of normal and androgen treated pigeons. *Proc. natn. Inst. Sci. India*, **16**, 177.
 - The effect of progesterone and DCA on the distribution and concentration of alkaline phosphatase in the genital system of female pigeons. *ibid.* **16**, 373.
 - (With MUKERJI B) The regulation of enzyme activities by sex hormones. *Indian J. Pharm.*, **12**, 186.
1951. Responses of the adrenocortical alkaline phosphatase to exp. hyperadrenalism. *Proc. natn. Inst. Sci.*, India, **17**, 357.
- (With GHOSH A) Responses of the adrenocortical alkaline phosphatase to progesterone and DCA. *ibid.* **17**, 23.
 - Studies in the distribution and concentration of alkaline phosphatase in the testis of normal and DCA treated juvenile sparrows. *ibid.* **17**, 21.
 - (With GHOSH A) The effectiveness of gonadotrophic hormone therapy in the prevention of testicular atrophy in the pigeon caused by adrenaline. *ibid.* **17**, 227.
 - Studies in the distribution and concentration of alkaline phosphatase in the oviduct of normal and sex hormone treated pigeons. *ibid.* **17**, 287.
 - Studies in the distribution and concentration of alkaline phosphatase in the testis of normal and sex hormones treated pigeons. *ibid.* **17**, 359.
 - (With GHOSH A) New evidence against a progesterone like action of ascorbic acid. *ibid.* **17**, 363.
 - (With BANERJI S and GHOSH A) Studies in the distribution and concentration of alkaline phosphatase in different tissues of alloxan diabetic rats. *Anat. Anz.*, **98**, 336.
 - (With GHOSH A) Renal alkaline phosphatase in the human foetus and in the adult pigeon. *Sci. Cult.*, **17**, 175.
1952. (With GHOSH A) Cytochemical distribution of ascorbic acid in the adrenal cortex of normal and estrogen treated pigeons. *Proc. natn. Inst. Sci. India*, **18**, 261.
- (With GHOSH A) Responses of the adrenocortical alkaline phosphatase in the guinea pig to various hormones. *ibid.* **18**, 151.
 - (With GHOSH A) The distribution of alkaline phosphatase in the adrenal cortex of the Rhesus monkey. *Sci. Cult.*, **17**, 337.
 - (With GHOSH A) The hormonal modification of alkaline phosphatase activity in the testis and in some male genital accessories of the guinea pig. *Proc. natn. Inst. Sci. India*, **18**, 197.
 - (With GHOSH A) Seasonal changes in the gonads of the common Indian cat *H. fossilis*. *Proc. Zool. Soc. Beng.* **5**, 29.



1952. (With GHOSH A and CHAKRAVARTY A P) The distribution of alkaline phosphatase in the genital organs of the new born human female. *Indian J. Physiol. all. Sci.*, **6**, 71.
1953. (With SUR R N) The effect of testosterone propionate on the formation of ovarian cysts in experimental hypothyroid rats. *Acta Endocr.* **13**, 173.
- Changes in the distribution of ascorbic acid and sudanophilia in the adrenal cortex of mice after prolonged stimulation with ACTH. *Anat. Anz.*, **100**, 39.
 - Studies on cytochemistry of hormone ACTH. Part XII : The effect of ACTH on the distribution of alkaline phosphatase in the adrenal cortex of the cat. *Proc. Indian Acad. Sci.*, **19**, 487.
 - (With ROY A C and KARKUN J N) The effect of progesterone, serum gonadotrophin and testosterone propionate on histology and ascorbic acid content of the adrenal of rat. *J. scient. ind. Res.*, **10**, 470.
 - Changes in the distribution of alkaline phosphatase in the genital organs of the female rat after adrenalectomy and after replacement therapy. *Proc. Indian Acad. Sci.*, **19**, 353.
 - (With DE N N) Die working kombinierter progesteron and testosteron propionate therapie suf die samenblasen reifer kastratier ratten. *Endokrinologie* **30**, 323.
 - (With ROY A C and SUR R N) The effect of testosterone propionate on total cholesterol content of the adrenals of experimental hypothyroid rats. *Acta Endocr.*, **14**, 254.
 - (With KARKUN J N and MUKERJI B) Evidence against corticotrophin like action of melanophore hormone on the adrenal cortex of mice. *Acta Endocr.*, **13**, 188.
 - The problem of the mechanism of hormonal actions. *Sci. Cult.*, **18** 572.
1954. (With KARKUN J N *et al*) The influence of thyroxine on the response of the ovary of immature rats to gonadotrophic hormone. *Arch. int. Pharmacodyn. Ther.*, **99**, 97.
- The effect of experimental tuberculosis on the distribution of alkaline phosphatase in the adrenal cortex of the guinea pig. *Nature*, **173**, 210.
 - (With KARKUN J N and ROY S K) The effect of ACTH on the genital organs of young female rats. *Acta Endocr.*, **15**, 101.
 - (With ROY S K and KARKUN J N), Studies in the distribution and concentration of alkaline phosphatase in the vaginal smear of the rat during estrus cycle : the effect of ovariectomy and replacement therapy. *Proc. Indian Acad. Sci.*, **20**, 170.
 - (With KARKUN J N and MUKERJI B) Responses of the pars intermedia of the cat's hypophysis to ACTH. *J. Endocr.*, **10**, 124.
 - (With KARKUN J N) The effect of ACTH on alkaline phosphatase activity in the pars intermedia of the cat's hypophysis. *Proc. natn. Inst. Sci. India*, **20**, 428.
 - (With KARKUN J N and DATTA S N) The effect of melanophore hormone on the adrenals of hypophysectomised rats. *Acta Endocr.*, **16**, 137.
 - (With CHAK I M) The effect of estradiol dipropionate on the development of Trypanosome equiperdum in rats and mice. *J. scient. ind. Res.*, **7**, 480.
1955. (With KARKUN J N and DATTA S N) The influence of thyroxine on thyrotrophic action of PMS gonadotrophin in rats. *Acta Endocr.*, **18**, 1.
- (With ROY A C and CHAKRAVARTY R N) The effect of testosterone propionate on glycogen content and histopathology of the liver of experimental hypothyroid rats. *Indian J. med. Res.*, **43**, 217.



1955. (With ROY S K and ROY A C) The effect of testosterone propionate on testis and the seminal vesicles of experimental hypothyroid rats. *J. scient. ind. Res.*, **14C**, 129.
- (With ROY S N and DATTA S N) The influence of testosterone propionate on the response of the testis of young rats to thyroxine. *Archs. int. Pharmacodyn. Ther.*, **98**, 450.
- (With ROY S K and KARKUN J N) The effect of ACTH on alkaline phosphatase activity in the kidney and intestine of rats. *Acta histochem.*, **1** 75.
- A study on ACTH estrogen interaction on genital organs of young female rats. *J. scient. ind. Res.*, **4**, 89.
- (With ROY S N) The effect of testosterone propionate on total cholesterol content of the testis of young rats. *Acta endocr.*, **18**, 267.
- (With ROY A C *et al*) Response of the adrenals of thyroxine treated rats to ACTH. *Archs. int. Pharmacodyn. Ther.*, **C1** 247.
- (With BOSCOFF R J) Preliminary investigations on the influence of reserpine therapy on adrenocortical function in schizophrenia. *CSIR Proc. on Rauwolfia*, Calcutta.
1956. (With POVER W F R and BOSCOFF R J) The influence of sex hormones on the uptake of Zn⁶⁵ by the dorsolateral prostate of the rat. *Acta endocr.*, **22**, 390.
- (With DE N N) Further evidence of the enhancement of androgenic action of testosterone propionate by progesterone. *Proc. natn. Inst. Sci. India.*, **22**, 113.
- (With MUKERJI B) The world population pressure and urgent need for studies on physiology of human reproduction. *Sci. Cult.* **22**, 292.
- (With BOSCOFF R J) Paper chromatographic and biological properties of reserpine and related compounds. *Nature*, **176**, 1077.
- (With BOSCOFF R J) Preliminary investigation on the influence of reserpine and Lysergic acid diethylamide (LSD) on the uptake of ¹³¹I by the thyroid of the rats. *Indian J. Pharm.*, **18**, 296.
- (With BOSCOFF R J and JEAUVONS M) The influence of reserpine therapy on adrenocortical function in schizophrenia. *Experientia*, **12** 271.
1957. (With KARKUN J N and DE N N) The effect of 19-nortestosterone on the adrenal cortex of the rat. *Acta Endocr.*, **25** 238.
- Effect of 19-nortestosterone on genital organs and pregnancy in rats. *Proc. Natn. Inst. Sci. India*, **23** 123.
- (With DE N N) The effect of 19-nortestosterone on antiphlogistic action of cortisone. *J. scient. ind. Res.*, **16**, 146.
1958. (With KARKUN J N and DAS R P) Unusual ovarian changes in sexually immature rats after treatment with CdCl₂. *Sci. Cult.*, **23** 561.
- (With ROY S N and DAS R P) Effect of aldosterone monoacetate and DOCA on the testis of young rats. *Acta Endocr.*, **29**, 361.
- (With RAY S N) Effect of aldosterone monoacetate and DOCA on the adrenal cortex of rats. *Acta Biol. Med. Germ.*, **18**, 101.
- (With ROY S N) Ponderal and histologic changes in the adrenal cortex of rats after treatment with triiodothyronine. *Indian J. Med. Res.*, **46**, 739.
1959. (With KARKUN J N and DAS R P) Effect of cadmium chloride on the responses of the genital organs of gonadectomised male and female rats to homologous sex hormones. *ibid*, **47**, 20.
- (With KARKUN J N and DAS R P) Effect of adrenalectomy on the testis of CdCl₂ treated rats. *Proc. natn. Inst. Sci. India*, **25**, 61.
- (With DAS R P) Effect of CdCl₂ on the response of the uterus of ovariectomised rats to progesterone. *J. scient. ind. Res.*, **18**, 79.
- (With ROY S N and DAS R P) Effect of triiodothyronine on genital organs and fertility of male rats. *Proc. natn. Inst. Sci. India*, **24**, 296.



1959. Biological evaluation of oral contraceptives. *Indian J. Pharm.*, **21**, 241.
- (With DAS R P and KARKUN J N) Ovarian changes in prepuberal rats after treatment with cadmium chloride. *Acta Biol. Med. Germ.*, **3**, 372.
 - (With DE N N) Experimental heat stress and the adrenal hormones. *Climate, Environment and Health Bull. NISI*, **10**, 41.
 - (With MUKERJI B) The adrenal cortex in heat and cold stress. *Sci. Cult.*, **25**, 16.
1960. (With DAS R P) Effect of 3:5:3' triiodothyronine on the onset and duration of action of testosterone propionate. *Acta Biol. Med. Germ.*, **5**, 174.
- (With DAS R P) Testicular changes in rats after treatment with cadmium chloride. *Acta Biol. Med. Germ.*, **5**, 153.
 - (With DASGUPTA P R and DAS R P) Effect of cadmium chloride on gonadotrophin content of the pituitary of male and female rats. *J. scient. ind. Res.*, **19**, 225.
 - (With DAS R P) Anti-vitamin E effect of cadmium on rat testis. *ibid*, **19**, 309.
 - (With DAS R P and MUKERJI B) Prevention of cadmium induced changes in the gonads of rats by zinc and selenium—a study in antagonism between metals in the biological system. *Proc. natn. Inst. Sci. India*, **26B**, (Suppl.), 40.
 - (With SARKAR S L) Effect of some metals on the action of male and female sex hormones. *J. scient. ind. Res.*, **19**, 241.
 - (With MUNDLE M and ROY A C) Effect of some aromatic compounds on the response of genital organs of immature female rats to exogenous gonadotrophic hormones. *ibid*, **19**, 264.
 - The nature and influence of thyroid on gonad-pituitary mechanisms. *Bull. NISI*, **17**, 3.
 - Influence of sex hormones on the uptake of Zn^{65} by the rat liver. *Curr. Sci.*, **29**, 182.
 - (With DASGUPTA P R and MUKERJI B) Prehormones. *Proc. natn. Inst. Sci., India*, **26B**.
1961. (With DAS R P) Responses of the adrenals of chronic hypothyroid rats to ACTH and epinephine : the role of testis. *ibid*, **27B**, 56.
- (With DAS R P) Effect of corticoids on the testis of cadmium chloride treated rats. *ibid*, **27B**, 46.
 - (With DAS, R P and ROY, A. C.) The cellular basis of estrogen production by the rat testis. *ibid*, **27B**, 226.
 - (With KAPUR N K and AGARWALA S C) The distribution and retention of cadmium in subcellular fractions of rat liver. *Ann. Biochem. exp. Med.*, **21**, 51.
 - (With SARKAR S L) Endocrine and prostate I. Sensitivity of the prostatic complex of thyroidectomized rats to androgen. *ibid*, **21**, 283.
 - (With DAS R P and KRISHNAMURTI C R) Succinoxidase activity in rat gonads after cadmium chloride administration. *J. scient. ind. Res.*, **20C**, 259.
 - (With DAS R P and DASGUPTA P R) Effect of low dose of $CdCl_2$ on the genital organs and fertility of male rats. *ibid*, **20C**, 322.
 - (With DASGUPTA P R and DAS R P) Effect of some analogues of thyroid hormones on genital organs and fertility of male rats. *Indian J. med. Res.*, **49**, 1123.
 - Chemical sterilisation of male rhesus monkeys. *Endocrinology*, **69**, 1116.
 - (With SARKAR S L and BOSE A R) Prostate and Endocrines II. The sensitivity of the prostate of thyroidectomised guinea pigs to estrogen. *Ann. Biochem. exp. Med.*, **21**, 333.
1962. (With DAS R P) Effect of cadmium chloride on fertility of rats. *Indian J. Vet. Sci.*, **32**, 210.



- (With DAS R P) Sterilisation of males by intratesticular administration of $CdCl_2$. *Acta endocr.*, **40**, 321.
- Chemical sterilisation of male goats. *Indian J. Vet. Sci.*, **32**, 70.
- (With PRAHLAD K V and SEN D P) Mating and implantation in aged rats : effect of thyroid hormone therapy. *Gerontologia*, **6**, 144.
- (With DASGUPTA P R) *In vitro* metabolism of rat pituitary gonadotrophin. *Curr. Sci.*, **31**, 16.
- (With PRAHLAD K V and DAS R P) Effect of diethylstilbestrol therapy on cystic and involutionary changes in the genitalie of aged female rats. *Gerontologia*, **6**, 152.
- Antifertility effect of trianisylchloroethylene (TACE). *Indian J. Vet. Sci.*, **32**, 190.
- (With KARKUN J N and DAS R P) Hypothyroidism and Reproduction in male rats. *Ann. Biochem. exp. Med.*, **22**, 25.
- (With KHANNA N M *et al*) Antifertility effect of emetine dimer. *J. scient. ind. Res.*, **21C**, 84.
- (With DASGUPTA P R) Prostate and Endocrines III. Effect of somatotrophin on the sensitivity of the rat prostatic complex to sex hormones. *Ann. Biochem. exp. Med.*, **22**, 213.
- (With DAS R P and KAMBOJ V P) Thyroid status and formation of experimental hydro-uteri in rats. *J. scient. ind. Res.*, **21C**, 165.
- (With MUKHERJI A P and KARKUN J N) A possible direct effect of thiourea on the rat testis. *ibid*, **21C**, 222.
- (With KAMBOJ V P and DAS R P) Incident follicular atresia and acid phosphatase activity of ovary and serum of rats. *ibid*, **21C**, 231.
- 1963. (With KARKUN J N and SEN D P) Some extra-pigmentary effect of melanophore stimulating hormone. *Ann. Biochem. exp. Med.*, **23**, 253.
- (With GOSWAMI A and CHOWDHURY S R) Effect of 3:5:3' triiodothyronine on testicular lipid pattern in prepuberal monkeys. *Ann. Biochem. Exp. Med.*, **23**, 325.
- (With KARKUN J N and MUKHERJI A P) Reproduction in thyroidectomized adult male rats. *ibid*, **23**, 401.
- (With GOSWAMI A and CHOWDHURY S R) Uterine lipid metabolism in mice during the oestrus cycle : effect of ovariectomy and replacement therapy. *J. Reprod. Fert.*, **6**, 287.
- (With DAS R P) The nature of protective action of selenium on cadmium induced degeneration of the rat testis. *Proc. natn. Inst. Sci. India*, **29**, 297.
- (With DASGUPTA P R and DAS C) Testicular recovery from chronic suppressive effects of estrogen in hyperthyroid guinea pigs. *Ann. Biochem. exp. Med.*, **23**, 499.
- (With HARISH CHANDRA and DAS R P) Induced hyperthyroidism and sexual development in prepuberal rhesus monkeys. *Indian J. Exp. Biol.*, **1**, 172.
- (With BOSE A R and DAS R P) Effect of metaxylohydroquinone on the genital organ and fertility of male rats. *J. Reprod. Fert.*, **5**, 77.
- (With PRAHLAD K V) New evidence against putative anti-implantation effect of metaxylohydroquinone. *Fert. Steril*, **14**, 372.
- (With DAS R P and BANERJI A K) Potentiation of androgenic action of testosterone by sodium molybdate. *Ann. Biochem. exp. Med.*, **23**, 15.
- (With SETTY B S) Induction of ovulation in frogs by copper sulphate. *ibid*, **23**, 491.
- (With KAMBOJ V P) Sterilisation of male rats and rhesus monkeys by sro-injunction of cadmium chloride. *Proc. 7th IPPF Conf.*, 465.



1964. (With DASGUPTA, P R and DAS C) Metabolism of rat pituitary gonadotrophin. *Proc. Soc. Exp. Biol. Med.*, **116**, 253.
- (With KAMBOJ V P) Antitesticular effect of metallic and rare earth salts. *J. Reprod. Fert.*, **7**, 21.
- (With SETTY B S) The physio-kinetics of testicular recovery in the fowl after prolonged suppression by estrogen. *Indian J. Exp. Biol.*, **2**, 109.
- (With SETTY B S) Chemical sterilisation of male frogs. *Gen. Comp. Endocr.*, **4**, 353.
- (With KAMBOJ V P and DATTA J K) Prevention of delayed implantation in rats by means of an intrauterine foreign body. *J. Reprod. Fert.*, **8**, 139.
- (With KAMBOJ V P and DATTA J K) Effect of an intrauterine foreign body on the response of the rat ovary to exogenous gonadotrophin. *Indian J. Exp. Biol.*, **2**, 117.
- Some aspects of spermatogenesis in mammale. *5th All India Conf. Fam. Plan.*, **1**.
- The current status of research on oral contraceptives. *5th All India Conf. Fam. Plan.*, 312.
- (With KAMBOJ V P) Effect of an intrauterine device on gestation in rats. *Indian J. Exp. Biol.*, **2**, 229.
- (With KAMBOJ V P) Spermatozoal disintegration in rats with an intera vas deferens device. *ibid.* **2**, 240.
- (With Goswami A *et al*) Effect of a foreign body on the response of the uterus of ovariectomised rats to estrogen. *Steroids*, **4**, 159.
- (With GOSWAMI A *et al*) Studies in a methylcholanthrene induced fibrosarcoma of the rat testis and its response to cadmium. *Acta Biol. Med. Germ.*, **13**, 209.
1965. (With CHOWDHURY S R and KAMBOJ V P) Intertesticular distribution of cadmium in rats. *Indian J. Exp. Biol.*, **3**, 139.
- (With KAMBOJ V P and GOSWAMI A) Sterilisation of male rhesus monkeys by iron salts. *J. Reprod. Fert.*, **9**, 115.
- (With CHOWDHURY S R) Effect of Enovid on the lipid constituents of the rhesus monkey pituitary. *Curr. Sci.*, **34**, 212.
- Current development in the chemical control of conception. *Rajasthan Med. J.*, **5**, 43.
- (With KAMBOJ V P) Cadmium damage of the rat testis and its prevention. *Indian J. Exp. Biol.*, **3**, 45.
- Chemical sterilization of female guinea pigs. *ibid.* **3**, 50.
- (With CHOWDHURY S R *et al*) Changes in the biochemical composition of the rhesus monkey pituitary in relation to suppression of gonadotrophic activity by estrogen. *Steroids*, **5**, 519.
- (With BOSE A R) Antitesticular effect of ethynodiol diacetate in rats. *Experientia*, **55**, 49.
- (With HARISH CHANDRA and CHOWDHURY S R) Effect of Enovid on the response of the uterus of prepuberal rhesus monkeys to exogenous gonadotrophin. *Indian J. Exp. Biol.*, **3**, 79.
- (With GOSWAMI A *et al*) Effect of an intrauterine silk suture on uterus and fertility of rats. *J. Reprod. Fert.*, **9**, 317.
- (With KAMBOJ V P *et al*) Effect of long-term cyclic oral administration of Enovid on the genital organs of prepuberal female rhesus monkeys. *Indian J. Exp. Biol.*, **3**, 69.
- (With HARISH C) Response of the ovary of prepuberal langoors. (*Presbitys entellus*) to heterologous mammalian gonadotrophin. *Acta anat.*, **60**, 608.
- (With KAMBOJ V P) Effect of an intrauterine contraceptive device on histologic and histochemical changes in the rabbit uterus. *Indian J. Exp. Biol.*, **3**, 141.



1965. (With CHOWDHURY S R) Effect of long-term cyclic oral administration of Enovid on the lipid constituents of the serum and liver of rats. *Steroids*, **6**, 89.
- (With CHATTERJI S N) Sterilisation of female goats by cadmium chloride. *Vet. Rec.*, **77**, 1108.
- (With CHOWDHURY S R *et al*) Effect of intrauterine contraceptive device on the uterus of rhesus monkeys. *Int. J. Fert.*, **10**, 321.
- (With CHOWDHURY S R *et al*) Effect of an intrauterine contraceptive device on fallopian tubes of rhesus monkeys. *Endokrinologie*, **49**, 137.
- (With GROVER P K *et al*) New antifertility agents : 2, 3 diphenylbenzourans. *J. Med. Chem.*, **8**, 720.
- (With ROY S K) Effect of prolonged estrogen treatment on thyroid function in male rhesus monkeys. *J. endocr.*, **33**, 331.
- (With KARKUN, J N) Effect of Megestrol acetate on the genital organs and fertility of male rats. *Indian J. Exp. Biol.*, **3**, 213.
- (With SETTY B S) Biological evaluation of cyclopentyl-enol-ether of 19-nortestosterone acetate as a male oral contraceptive. *Indian J. med. Res.*, **53**, 1180.
- (With CHANDRA H and KAMBOJ V P) Long-term effect of vasectomy on gonad pituitary system of rats. *Acta Biol. Med. Germ.*, **15**, 381.
- Prostate and Endocrines. IV. The thyroid status and titration of sex hormones by the rat prostatic complex. *Indian J. Exp. Biol.*, **4**, 7.
- (With DATTA J K and KAMBOJ V P) Effect of metoxylohydroquinone on the response of the accessory genital organs of gonadectomized male and female rats to homologous sex hormones. *Indian J. med. Res.*, **53**, 1186.
- (With CHOWDHURY S R) The distribution of zinc in the subcellular fractions of the rat rhesus monkey prostate. *J. Urol.*, **96**, 370.
- (With DATTA J K) Induced hyperthyroidism and sexual development in prepuberal female rhesus monkeys. *Arch. Mikrosk. Anat. Exp. Morphol.* **54**, 119.
- (With DATTA J K) Induced hyperthyroidism and reproduction in prepuberal rats. *Indian J. Exp. Biol.*, **3**, 82.
- (With CHANDRA H) Effect of some progestational steroids on the response of the ovary of prepuberal rhesus monkeys to exogenous gonadotrophin. *Steroids*, **6**, 463.
- (With CHANDRA H) Uterine bleeding in rhesus monkeys after insertion of an intrauterine contraceptive device. *Indian J. Exp. Biol.*, **3**, 269.
- (With KAMBOJ V P *et al*) Effect of contraceptive suture on biochemical composition of the rabbit fallopian tube fluid. *ibid*, **3**, 268.
1966. (With PANDE J K *et al*) The biochemical composition of the rat testis fluid. *Proc. Soc. Exp. Biol. Med.*, **121**, 899.
- (With KARKUN J N) Anti-androgenic effect of megestrol acetate. *Acta Biol. Med. Germ.*, **16**, 230.
- (With KAMBOJ V P) Effect of an intra-vas deferens contraceptive suture on fertility of rats. *ibid*, **16**, 313.
- (With CHANDRA H and KAMBOJ V P) Effect of non-primate gonadotrophin on the testis of prepuberal rhesus monkeys. *ibid*, **16**, 450.
- (With KAMBOJ V P) Anti implantation effect of some aromatic sulphur derivatives. *Indian J. Exp. Biol.*, **4**, 120.
- (With DASGUPTA P R and JEHAN Q) *In vitro* action of cadmium chloride on isolated seminiferous tubules of the rat testis. *Acta Biol. Med. Germ.*, **16**, 665.
- (With KAMBOJ V P) Effect of an intra-Fallopian tube suture on pregnancy in rabbits. *Indian J. Exp. Biol.*, **4**, 119.
- (With KAMBOJ V P *et al*) Effect of an intrauterine contraceptive device on the sensitivity of the uterus and the fallopian tubes of ovariectomized rhesus monkeys to estrogen. *ibid*, **4**, 171.



1966. (With ROY S K and SETTY B S) Effect of progestational steroids on thyroid function in rhesus monkeys. *Indian J. Exp. Biol.*, **4**, 173.
- (With BOSE A R and DASGUPTA P R) Sialic acid in the genital organs of the male rat. *Curr. Sci.*, **38**, 336.
- (With SRIVASTAVA K) Effect of estrogen on pituitary gonadotrophic activity of thyro-ovariectomized monkeys. *Indian J. Exp. Biol.*, **4**, 243.
- (With SRIVASTAVA K) Induced hypothyroidism and sexual development in prepuberal monkeys. *Acta Biol. Med. Germ.*, **17**, 193.
- (With CHANDRA H) Insensitivity of the prepuberal rhesus monkey testis to serotonin and histamine. *Curr. Sci.*, **35**, 365.
- (With SETTY B S) Effect of deladroxone on spermatogenesis in rats and rhesus monkeys. *Steroids*, **8**, 33.
- (With CHANDRA H) Insensitivity of the rhesus monkey testis to 1-(N, N-diethyl-carbamylmethyl)2, 4-dinitropyrrrole. *Indian J. Exp. Biol.*, **4**, 174.
- (With JEHAN Q *et al*) Effect of N, N'-bis (dichloroacetyl) - 1, 8-octamethylene diamine on the chemical composition of the rat seminiferous tubules. *Int. J. Fert.*, **11**, 291.
- The future of contraception. *J. Fam. Welf.*, **13**, 47.
- (With KAMBOJ V P and CHOWDHURY A R) Effect of a foreign body on oxygen consumption of the rat uterus. *Curr. Sci.*, **35**, 543.
- (With Kamboj V P) Antiimplantation effect of 2, 3-diphenylindoles and related compounds. *Indian J. Exp. Biol.*, **4**, 244.
1967. (With CHATTERJI S N) Sterilization of scrub cows with cadmium chloride. *Vet. Rec.*, **80**, 569.
- (With CHANDRA H) Uterine bleeding in prepuberal rhesus monkeys after intrauterine contraceptive device insertion. *Am. J. Obstet. Gynec.*, **97**, 279.
- (With KAMBOJ V P and SETTY B S) Antispermatic effect of some progestational steroids in rats. *Indian J. Exp. Biol.*, **5**, 45.
- (With ROY S K) Foetal effect of norethynodral in rats. *ibid*, **5**, 14.
- (With KAMBOJ V P *et al*) Long-term effect of an intrauterine contraceptive device on the uterus and Fallopian tubes of rhesus monkeys. *Am. J. Obstet. Gynec.*, **98**, 194.
- (With PANDE J K and DASGUPTA, P R) The chemical composition of fluid collected from testis of the rhesus monkey and goat. *Indian J. Exp. Biol.*, **5**, 65.
- (With SETTY B S) Effect of deladroxone on the response of the ovary of hypophysectomized rats to exogenous gonadotrophin. *ibid*, **5**, 44.
- (With GUPTA D N and KARKUN J N) Biochemical composition of the different portions of the rabbit Fallopian tube. *ibid*, **5**, 124.
- (With KAMBOJ V P) Effect of an intrauterine contraceptive suture on post-partum involution of the rat uterus. *ibid*, **5**, 241.
- (With KAMBOJ V P and SETTY B S) The biological properties of 2-phenyl-3-pyrrolidinoethoxy phenyl-6-methoxy-benzofuran hydrochloride—a new oral antifertility agent. *ibid*, **5**, 80.
- (With PANDE J K and DASGUPTA P R) The biochemical composition of the human testis fluid. *J. Clin. Endocr. Metab.*, **27**, 892.
- The mechanism of action of intrauterine foreign bodies in animals. *Proc. 8th IPPF Conf.*, 393.
- (With IYER R N *et al*) Anti implantation effect of 2, 3-diphenylacryolophenones. *Indian J. Exp. Biol.*, **5**, 169.
- (With SETTY B S) Interruption of spermatogenesis by percutaneous applications of steroids. *Steroids*, **10**, 687.
- (With CHATTERJI S N) Chemical sterilization of stray dogs. *Indian Vet. J.*



1967. (With CHANDRA H) Uterine bleeding in rhesus monkeys after intrauterine contraceptive device : insertion effect of antihistaminic drugs. *Indian J. Exp. Biol.*, **6**, 118.
1968. (With JEHAN Q *et al*) Effect of bisulphan on biochemical composition of rat seminiferous tubules. *ibid*, **6**, 9.
- (With KAMBOJ V P and CHANDRA H) Effect of some chemicals on spermatogenesis in rhesus monkeys. *J. Reprod. Fert.*, **16**, 165.
- (With PANDE J K and DASGUPTA P R) Effect of antispermatogenic agents on biochemical composition of testicular fluid of rhesus monkeys and rats. *indian J. Exp. Biol.*, **6**, 135.
- (With SETTY B S and KAMBOJ V P) Post-coital contraception by topical application of some steroidal and non-steroidal agents. *Am. J. Obst. Gynec.*, **102**, 306.
- (With SETTY B S) Effect of megestrol acetate on spermatogenesis in rhesus monkeys. *Indian J. Exp. Biol.*, **6**, 48.
- Mechanism of action of intrauterine contraceptive devices. *J. scient. ind. Res.*, **27**, 70.
- (With HARISH C) Uterine bleeding in rhesus monkeys after intrauterine contraceptive device insertion. Effect of antihistaminic drugs. *Indian J. Exp. Biol.*, **66**, 118.
- (With ROY S K and SINGH V P) Effect of contraceptive suture on incorporation of dl-valine-1-14C in the uterine fluid protein of rats. *ibid*, **6**, 253.
- (With HARISH C) Uterine bleeding in rhesus monkeys after intrauterine contraceptive device insertion : Effect of a long-term acting progestational steroid, 17- α -hydroxyprogesterone caproate. *ibid*, **6**, 255.
- (With HARISH C *et al*) Effect of an intrauterine contraceptive device on post-partum involution of the rhesus monkey uterus. *Am. J. Obst. Gynec.*, **101**, 760.
- (With ENGINEER A D *et al*) Effect of an intrauterine contraceptive device on biochemical composition of uterine fluid. *ibid*, **101**, 966.
- (With TAKKAR G L) Calcification of the seminiferous tubules of the rat testis after cadmium administration : Prevention by zinc and selenium. *Acta Biol. Med. Germ.*, **20**, 97.
- (With BOSE A R) Distribution of sialic acid in the genital organs of male rhesus monkeys : Effect of castration and replacement therapy. *Curr. Sci.*, **37**, 168.
- (With CHOWDHURY A R) Effect of castration and replacement therapy on subcellular distribution of zinc in rhesus monkey prostate. *ibid*, **37**, 230.
- (With CHOWDHURY A R) Distribution of zinc in the subcellular fractions of human prostate. *ibid*, **37**, 375.
- (With TRIPATHI S S and ROY S K) Effect of protein deficiency on genital organs and fertility of male rats. *Indian J. Exp. Biol.*, **6**, 195.
- (With DATTA I C and KARKUN J N) Studies on physiology and biochemistry of the cervix : Changes in the cervix of rats during estrus cycle. *Acta Biol. Med. Germ.*, **20**, 147.
- (With DATTA I C and KARKUN J N) Studies on physiology and biochemistry of cervix : Changes in the cervix of rats during pregnancy and post partum periods. *ibid*, **20**, 163.
- (With DATTA I C and KARKUN J N) Studies on physiology and biochemistry of the cervix : Effect of estrogen and progesterone on the rat cervix. *ibid*, **20**, 97.
- (With DATTA I C and KARKUN J N) Studies on physiology and biochemistry of the cervix : Changes in the cervix of rhesus monkeys during menstrual cy



1968. Effect of ovariectomy and estrogen therapy. *Acta Biol. Med. Germ.*, **20**, 503.
- (With CHOWDHUARY, S R *et al*) Lipid and electrolyte composition of different portions of the ruffit Fallopian tube. *Curr. Sci.*, **37**, 405.
1969. Non-steroidal antifertility agents interfering with different phases of reproduction in the female. *J. scient. ind. Res.*, **28**, 45.
- (With CHATTERJI S N) Further studies on sterilization of scrub cows with cadmium chloride. *Indian Vet. J.*, **46**, 46.
 - (With JEHAN Q *et al*) Prevention of busulphan induced antispermatogenesis in rates by follicle stimulating hormone and zinc. *Indian J. Exp. Biol.*, **7**, 173.
 - (With SETTY B S) Nature and site of action of 3-chloro-1, 2-propanediolan oral antifertility agent for the male. *ibid*, **8**, 49.
 - (With SETTY B S) Antispermatogenic effect of norgestrel in rhesus monkeys. *ibid*, **7**, 49.
 - (With HARISH C) Uterine bleeding in rhesus monkeys after intrauterine contraceptive device insertion : Effect of long acting antihistaminic drugs. *ibid*, **7**, 118.
 - (With KARKUN J N and MALAVIYA B) Effect of an intrauterine contraceptive suture on biochemical composition of the rat uterus during implantation. *ibid* **7**, 118.
 - (With HARISH C) Uterine bleeding in amenorrhic rhesus monkeys after intra-erine contraceptive device insertion. *ibid*, **7**, 263.
 - (With DASGUPTA P R and ENGINEER A D) Mechanism of action of intrauterine contraceptive devices. *J. Fam. Welf.*, **16**, 25.
 - (With ENGINEER A D *et al*) Effect of intrauterine contraceptive device on urea content of uterine fluid. *Am. J. Obstet. Gynec.*, **104**, 607.
 - (With PANDE J K and DASGUPTA P R) Effect of vasectomy on biochemical composition of the rat testicular fluid. *Curr. Sci.*, **38**, 112.
 - (With TRIPATHI S S and ROY S K) Response of the prostatic complex of protein deficient rats to sex hormones. *Endokrinologia*, **55**, 186.
 - (With ROY S K and PANDE J K) Uptake of ^{131}I by rat testis and its distribution. *Indian J. Exp. Biol.*, **7**, 48.
 - (With TAKKAR G L and KAMBOJ V P) Effect of altered hormonal state on histochemical distribution of alkaline and acid phosphatase activity in the rat prostatic complex. *ibid*, **7**, 205.
 - (With ROY S K and TRIPATHI S S) Protein synthesis in the testis of protein deficient rats : Effect of gonadotrophin hormone and testosterone propionate. *ibid* **7**, 214.
 - (With SRIVASTAVA K and SETTY B S) Effect of castration and estrogen on the pituitary gonadotrophin content in thyroidectomized prepuberal and adult male rats. *Endocr. Exp.*, **3**, 155.
 - (With TAKKAR G L and KAMBOJ V P) Effect of altered hormonal states on the histochemical distribution of lipase activity in the rat prostatic complex. *Histochemic*, **20**, 21.
 - (With SINGH J N and SETTY B S) Effect of estrogen on survival of spermatozoa in the genital tract of castrated male rats. *Indian J. Exp. Biol.*, **7**, 174.
 - (With PANDE J K and DASGUPTA P R) Comparative biochemistry of testicular fluid in some mammals. *Gen. Comp. Endoc.*, **2**, 156.
 - (With DATTA I C and KARKUN J N) Physiological and biochemical changes in cervix of goats during oestrus cycle. *Indian Vet. J.*, **46**, *Suppl.* 490.
 - (With ROY S K *et al*) In vitro uptake of dl-valine-1- ^{14}C by different parts of the rabbit fallopian tube. *Curr. Sci.*, **38**, 214.
 - (With GUPTA D N and KARKUN J N) Studies on physiology and biochemistry of the fallopian tube : response of the different parts of the rabit fallopian tube to estrogen and progesterone. *Acta Biol. Med. Germ.*, **22**, 551.



1969. (With SRIVASTAVA K and SETTY B S) Effect of estrogen on pituitary gonadotrophin content of thyroovariectomized prepuberal and adult female rats, *Edocrinologic*, **55**, 66.
1970. (With KAMBOJ V P *et al*) Biological properties of 2-phenyl-3-p-(3-pyrrolidinoethoxy)-phenyl-(2 : 1, b) naphthofuran - a new oral antifertility agents, *Contraception*, **1**, 29.
- (With CHAWLA H P S *et al*) Antifertility agents. IV. 2, 3-Diphenylbenzene and 5, 6-polymethylenebenzofurans, 2,2-diphenyl naphthofuran and some related compounds. *J. Med. Chem.* **13**, 54.
- (With GOPALACHARI R *et al*) Antifertility agents—Part V : 3-alkyl-2, 3-diphenylpropiophenones. *Contraception*, **2**, 199.
- (With KAMBOJ V P) Development of non-steroidal, orally active post-coital contraceptives. *Indian J. Pharmacol.*, **2**, 2.
- (With SETTY B S and KAMBOJ V P) Antiuterotrophic activity of benzo- and naphthofurans : New oral antifertility agents. *Indian J. Exp. Biol.*, **8**, 139.
- (With SETTY B S and ROY S K) Studies with sub-toxic doses of α C-chlorohydrin in the male monkey (*Macaca mulatta*). *Contraception*, **1**, 279.
- (With SINGH J N *et al*) Functional sterility in male rats after microdose estrogen treatment. *ibid*, **1**, 374.
- (With SANWAL P C *et al*) Long-term effect of a continuous low dose of megestrol acetate on the genital organs and fertility of female rats. *Steroids*, **15**, 711.
- (With SETTY B S) Steroids as contraceptives for the male. *Indian J. Pharmacol.*, **2**, 27.
- (With SEN A *et al*) Long-term effect of a continuous daily micro dose of norgestrel on the genital organs and fertility of female rats. *Contraception*, **2**, 59.
- (With DASGUPTA P R *et al*) Antiestrogenicity of Norgestrel. *Curr. Sci.*, **39**, 467.
- (With SANWAL P C *et al*) Studies on physiology and biochemistry of the cervix : response of the rat cervix to a continuous low dose of Megestrol acetate. *Indian J. Exp. Biol.*, **8**, 326.
- (With MALAVIYA B and KARKUN J N) Effect of intrauterine contraceptive suture on the response of rat uterus to prolonged estrogen treatment. *ibid* **8**, 19.
- (With CHANDRA H) Uterine bleeding in rhesus monkeys after intrauterine contraceptive device insertion : Effect of adrenoese saliculate and p-aminoethylbenzoic acid. *ibid*, **8**, 48.
- (With CHANDRA H) Uterotrophic action of an intrauterine contraceptive device in rhesus monkeys. *ibid*, **8**, 50.
- (With ENGINEER A D and DASGUPTA P R) Chemical composition of the deposit formed on the Lippes loop after prolonged use. *Am. J. Obstet. Gynec.*, **106**, 315.
- (With CHANDRA H *et al*) Long-term effect of an intrauterine contraceptive device on genital organs of rhesus monkeys. *J. ibid* **106**, 457.
- (With CHANDRA H) Pharmacologic management of uterine bleeding in rhesus monkeys caused by intrauterine contraceptive device (IUCD). *Indian J. Pharmacol.*, **2**, 22.
- (With SETTY B S) Effect of estrogen, progesterone and their combination in rat testis. *Endokrinologie*, **55**, 301.
- (With TAKKAR G L and KAMBOJ V P) Effect of altered hormonal states on histochemical distribution of nucleic acids in the rat prostatic complex. *Indian J. Exp. Biol.*, **3**, 63.
- (With SHARMA S N and KAMBOJ V P) Effect of metallic salts on histochemical distribution of calcium in the rat testis. *Histochemie*, **21**, 136.



1970. (With TAKKAR G L and KAMBOJ V P) Influence of altered hormonal states on mast cells of the rat prostatic complex. *Indian J. Exp. Biol.*, **8**, 157.
- (With JEHAN Q and KAMBOJ V P) Effect of progesterone on biochemical composition of rat seminiferous tubules. *ibid*, **8**, 68.
- (With TAKKAR G L and KAMBOJ V P) Effect of altered hormonal states on the histochemical distribution of succinic dehydrogenase activity in the rat prostatic complex. *Acta histochem.*, **36**, 181.
- (With GUPTA D N and KARKUN J N) Biochemical maturation of rabbit Fallopian tube. *Indian J. Exp. Biol.*, **8**, 140.
- (With GUPTA D N and KARKUN J N) Biochemical changes in different parts of the rabbit fallopian tube during passage of ova. *Am. J. Obstet. Gynec.*, **106**, 833.
- (With GUPTA D N and KARKUN J N) Effect of estrogen and progesterone on uterotubal junction of ovariectomised rabbits. *Endokrinologie*, **55**, 311.
- (With GUPTA D N and KARKUN J N) Studies on physiology and biochemistry of the Fallopian tube : histologic changes in different parts of the rabbit fallopian tube during early pregnancy. *Indian J. Exp. Biol.*, **8**, 162.
- (With SHARMA S N and KAMBOJ V P) Calcification of the rat testis after local administration of formaldehyde. *Exp. Path.*, **4**, 309.
1971. (With KAMBOJ V P *et al*) Antifertility activity of 3, 4-trans-2, 2-dimethyl-3-phenyl-4-(p-(B-pyrrolidinoethoxy)-phenyl-7-methoxy-chroman. *Indian J. Exp. Biol.*, **9**, 103.
- (With GOPALACHARI R *et al*) Antifertility agents Part VI : 1, 2, 3-triphenylpropenes. *ibid*, **9**, 104.
- (With SINGH J N *et al*) Effect of some steroids on spermatogenesis and fertility of rats. *ibid*, **9**, 132.
- (With CHATTERJEE S N and KAMBOJ V P) Effect of an intrauterine contraceptive suture on corpora lutea of guinea pigs. *ibid*, **9**, 105.
- (With DASGUPTA P R and ENGINEER A D) Uric acid in the uterine fluid of women fitted with Lippes loop and in deposits found on used devices. *Am. J. Obstet. Gynec.*, **110**, 593.
- (With CHANDRA H) Uterine bleeding in rhesus monkeys after intrauterine contraceptive device insertion : effect of a hemostatic drug. *Indian J. Exp. Biol.*, **9**, 106.
- (With SETTY B S) Effect of estrogen on tubal transport of ova in rats fitted with intrauterine contraceptive suture. *Curr. Sci.*, **40**, 106.
- (With JEHAN Q *et al*) Effect of estrogen on biochemical composition of the rat seminiferous tubules. *Acta Biol. Med. Germ.*, **26**, 543.
- (With ROY S K Jr *et al*) Thyroid status and *in vitro* uptake of testosterone 1, 2-³H and estradiol 6, 7-³H by the rhesus monkey prostate. *Indian J. Exp. Biol.*, **9**, 304.
- (With CHOWDHURY A R and KAMBOJ V P) Effect of some metallic salts on subcellular distribution of zinc in the dorsolateral prostate of rats. *ibid*, **9**, 424.
- (With GUPTA D N and KARKUN J N) Studies on physiology and biochemistry of the Fallopian tube : changes in uterotubal junction of rabbits during early pregnancy. *ibid* **9**, 4.
- (With SRIVASTAVA K and SETTY B S) Pituitary gonadotrophic activity of thyroidectomised prepuberal female rhesus monkeys. *Acta Biol. Med. Germ.*, **26**, 101.
- (With CHANDRA H *et al.*) The nature and kinetics of biochemical response in the genital organs of ovariectomized female rhesus monkeys to sex hormones. *Contraception*, **4**, 253.



1971. (With ROY S K Jr *et al*) Effect of an intrauterine contraceptive suture on *in vitro* uptake of 1, 2-³H-progesterone by the ovary and uterus of guinea pigs. *Indian J. Exp. Biol.*, 9, 496.
- (With KAMBOJ V P and CHOWDHURY S R) Effect of an intrauterine contraceptive suture on the urea content of uterine fluid of rats. *Curr. Sci.*, 40, 353.
- (With KAMBOJ V P and CHOWDHURY S R) Calcium and iron in the rat uterus and contraceptive suture after its prolonged intrauterine residence. *Indian J. Exp. Biol.*, 9, 417.
- (With SINGH V P and ROY S K) Effect of protein deficiency on the response of the rat uterus to an intrauterine contraceptive suture. *ibid*, 9, 499.
- (With DASGUPTA P R and DHAR M L) Spermicidal activity of urea, *ibid*, 9, 414.
1972. (With ROY S K *et al*) Biochemical composition and *in vitro* uptake of estradiol 6, 7-³H by the Fallopian tube—a preliminary study. *Am. J. Obstet. Gynec.*, 112, 299.
- (With ROY S K Jr *et al*) Effect of intrauterine contraceptive device on *in vitro* uptake of estradiol-17/3-6, 7-³H by the endometrium—a preliminary study. *ibid*, 112, 301.
- (With SETTY B S) Prostaglandins and 'functional sterility' in male rats. *Curr. Sci.*, 41, 64.
- (With SHARMA S N and KAMBOJ V P) Antiimplantation effect of dihydro-tachysterol in rats. *ibid*, 41, 181.
- (With GHOSH M *et al*) Effect of sex hormones and intrauterine contraceptive suture on β -glucuronidase activity of rat uterus. *ibid*, 41, 217.
- (With ROY S K Jr *et al*) Studies on physiology and biochemistry of the Fallopian tube : *in vitro* uptake of *dl*-valine-1-¹⁴C by different parts of the rabbit Fallopian tube during early pregnancy. *Endokrinologie.*, 59, 221.
- (With ROY S K Jr *et al*) Studies on physiology and biochemistry of the Fallopian tube : *in vitro* uptake of estradiol-17/ β -6, 7-³H by different parts of the rabbit Fallopian tube, uterotubal junction, uterus, cervix and the vagina. *Indian J. Exp. Biol.*, 10, 26.
- (With RIAR S S and SETTY B S) Biochemical composition of primate epididymis. *Curr. Sci.*, 41, 453.
- (With SINGH V P and ROY S K) Effect of a contraceptive suture on biochemical composition of the uterine fluid of protein deficient rats. *Indian J. Exp. Biol.*, 10, 448.
- (With SHARMA S N and KAMBOJ V P) Calcification of the rat testis by some rare earth and radioactive metallic salts. *Exp. Path.*, 7, 176.
- (With DASGUPTA P R *et al*) Effect of a copper intrauterine contraceptive device on enzyme activity of the rat endometrium. *Contraception*, 6, 459.
- (With SEGAL S J *et al*) Fertility regulation in non-human primates by non-steroidal compounds. In *Proc. WHO Symp. on use of Non-Human Primates in Reproduction Research*, Sukhumi, USSR, P. 435.
- (With SETTY B S and DASGUPTA P R) Chemical occlusion of vas in rats. *Contraception*, 6, 329.
1973. (With DASGUPTA P R & CHOPRA, S K) Seminal plasma urea level and sperm count. *Lancet.*, 1, 770.
- (With WHITE I G) Aspects of physiology of sperm in the female genital tract. *Contraception*, 7, 183.
- (With RIAR S S & SETTY B S) Studies on the physiology and biochemistry of mammalian epididymis : Biochemical composition of epididymis—comparative study. *Fert. Steril.*, 24, 355.



1973. (With SINGH M M and KAMBOJ V P) Effect of some non-steroidal antifertility agents on histology and biochemistry of the uterus and uterine fluid during delayed implantation in rats. *Contraception*, **8**, 235.
- (With DHAR N K *et al*) Serum proteins with benign hyperplastic and malignant prostate. *Indian J. Cancer*, **10**, 188.
- (With CHANDRA H and DASGUPTA P R) Uterine bleeding in rhesus monkeys after insertion of polyethylene and copper containing polyethylene intrauterine contraceptive devices. *Indian J. Exp. Biol.*, **11**, 228.
- (With JEHAN Q and SETTY B S) Studies on physiology and biochemistry of mammalian epididymis : Effect of castration and steroid hormone replacement on sperm survival in rat epididymis. *Indian J. Exp. Biol.*, **11**, 270.
- (With DASGUPTA P R and SRIVASTAVA K) Effect of d-norgestrel on early pregnancy in rats. *Indian J. Exp. Biol.*, **11**, 321.
- (With RIAR S S and SETTY B S) Studies on physiology and biochemistry of mammalian epididymis : Histology, enzyme and electrolyte composition of epididymis-A comparative study. *Indian J. Exp. Biol.*, **11**, 365.
- (With KAMBOJ V P and SINGH M M) Effect of some non-steroidal antifertility agents on biochemistry of the uterus and uterine fluid in rats. *Indian J. Exp. Biol.*, **11**, 484.
- (With DHAR N K *et al*) Distribution and concentration of zinc in the subcellular fractions of benign hyperplastic and malignant neoplastic human prostate. *Exptl. Mol. Path.*, **19**, 139.
- (With SETTY B S *et al*) The role of electrolytes of the endometrium and uterine fluid during delayed implantation in rats. *J. Endocr.*, **59**, 461.
- Current development in contraceptive technology in the female. *Proc. Indian Natn. Sci. Acad. (B)*, **39**, 429.
1974. (With MEHROTRA P K and KARKUN J N) Antiestrogenicity of some non steroidal compounds. *Indian J. Exp. Biol.*, **12**, 133.
- (With MATHUR K B and RISHI S) A cyclic tetrapeptide with antiimplantation activity. *Indian J. Exp. Biol.*, **12**, 370.
- (With SINGH M M and KAMBOJ V P) Effect of intravaginal instillation of some non-steroidal oral antifertility agents. *Indian J. Exp. Biol.*, **12**, 372.
- (With SETTY B S *et al*) Biochemical and contraceptive effects of an intravas device in the rat. *Fert. Steril.*, **25**, 612.
- (With MALAVIYA B and CHANDRA H) Induction of abortion in rhesus monkey with urea. *Indian J. Exp. Biol.*, **12**, 372.
- (With ROY S K *et al*) The effect of efferent duct ligation on the uptake of ^{65}Zn by the epididymis and vas deferens of rhesus monkey (*Macaca mulatta*). *Acta endocr.*, **77**, 186.
- (With SRIVASTAVA A K and DASGUPTA P R) Long-term effect of norgestrel on biochemical changes in rat fallopian tube. *Curr. Sci.*, **43**, 314.
- (With ENGINEER A D *et al*) Uric acid level of uterine fluid and blood of women with excessive uterine bleeding. *J. Obstet. Gynec. India*, **24**, 486.
- (With CHANDRA H and MALAVIYA B) Chemical occlusion of rhesus monkey oviducts with quinacrine. *Indian J. Exp. Biol.*, **12**, 447.
- (With MALAVIYA B and CHANDRA H) Chemical occlusion of vas by quinacrine in rhesus monkeys. *Indian J. Exp. Biol.*, **12**, 560.
1975. (With CHOWDHURY A R and CHOWDHURY S R) Effect of copper intrauterine contraceptive device on subcellular distribution and concentration of copper in the rat uterus. *Curr. Sci.*, **49**, 266.
- (With GHOSH M and ROY S K) Effect of copper intrauterine contraceptive device and nylon suture on the estradiol-17 β -3,6, 7- ^3H and progesterone 1, 2- ^3H (in the rat uterus. *Contraception*, **11**, 45.



1975. (With KAMBOJ V P *et al*) Antifertility efficacy of a new class of potential estrogenm *Indian J. Exp. Biol.*, **13**, 79.
- (With IMAM S K *et al*) Biochemical changes in fallopian tube and uterus of rhesus monkey *Macaca mulatta*) under influence of progestational contraceptive steroids. *Contraception*, **11**, 297.
- (With IMAM S K *et al*) Effect of 3, 4-*trans*-2,2-dimethyl-3-phenyl-4-p-(*l*-pyrrolidinoethoxy) pheny-7-methoxychroman (centchroman) on biochemistry of fallop in tube and uterus of rhesus monkey (*Macaca mulatta*). *Contraception*, **11**, 309.
- (With IMAM S K *et al*) Effect of 2-phenyl-3-p(*l*3-pyrrolidinoethoxy) phenyl-6-methoxy henzofuran hydrochloride (DBF) on biochemistry of fallopian tube and uterus of rhesus monkey (*Macaca mulatta*) *Conttaception*, **11**, 317.
- (With MALAVIYA B and CHANDRA H) Chemical occlusion of monkey oviducte with quinacrine : antagonism and reversal with estrogen. *Contraception*, **12**, 37.
1976. (With MEENAKSHI *et al*) Effective of normal and defective vasectomy on the urinary 17-ketosteroid excretion rate and total pituitary gonadotrophin content in dog. *Indian J. Exop. Biol.*, **14**, 95.
- (With DHAR J D and ROY S K) In vivo uptake of 65Zinc in the female genital tract of rat during pregnancy. *Indian J. Exp. Biol.*, **14**, 319.
- (With CHATTERJEE S N *et al*) Semen characteristics of normal and vasectomised dogs. *Indian J. Exp. Biol.*, **14**, 411.
- (With RAY S *et al*) Antifertility agents. 12-structure-activity relationship of 3, 4-diphenylchromenes and—chromans. *J. Med. Chem.*, **19**, 276.
- (With SETTY B S) Male contraception. In 'Recent development in contraceptive technology' edited by K R Laumas, Ankur Publishing Co., New Delhi, p. 97.
- (With CHANDRA H *et al*) Development of chemical method of tubal and vas occlusion. In 'Recent development in contraceptive technology' (ed. K R Laumes), Ankur Publishing Co., New Delhi, p. 131.
1977. (With SETTY B S and RIAR S S) Androgenic control of epididymal function rhesus monkey and rabbit. *Fert. Steril.*, **28**, 674.
- (With RIAR S S and SETTY B S) Functional maturation of the epididymis rabbit and rhesus monkey. *Endokrinologie.*, **70**, 249.

