

TABLE I
Chromosome associations at metaphase-I

Chromosome No.	No. of Plants	Quadrivalents		Trivalents		Bivalents		Univalents		Average pollen fertility (%)
		Range	Mean	Range	Mean	Range	Mean	Range	Mean	
33	5	0-5	1.63	0-3	1.19	4-14	10.87	0-4	1.87	63.68
34	4	0-4	1.16	0-2	0.97	7-15	11.62	0-5	3.09	61.69
35	2	0-4	1.24	0-2	1.18	8-16	12.04	0-5	2.43	78.16
36	2	0-3	1.21	0-4	1.95	9-15	11.75	0-4	1.82	70.16

The number of seeds per plant was one-third of those of autotetraploids.

Though one or more chromosomes were present, more than four times in each hypertetraploid plant, no pentavalent or hexavalent was observed. This indicates that the higher polyploids may form only bivalents and that spatial factor also has some influence on pairing in a crowded nucleus which does not enlarge proportionate to the increase in chromosome number. In a 7 x plant of *T. corniculata* also, no multivalent higher than a quadrivalents was observed¹. Anaphase-I irregularities in the autotetraploids result in the production of aneuploids. Though there was a significant reduction in the multivalent formation in the autotetraploids in C_4 and C_5 generations, irregular disjunction was still observed to some extent².

Aneuploids are usually morphologically inferior to the diploids and the autotetraploids, and, are meiotically unstable. Thus they adversely affect the vegetative and seed yield of the autotetraploids. However, because of their low frequency, the aneuploids do not pose a serious problem to the autotetraploids of *T. foenum-graecum* because only seven such plants were found in half an acre area in 1973-74. They produce fewer seeds per plant and their influence on yield is not much. Nevertheless, they must not be present in the autotetraploids and since they are identifiable from morphological characteristics, they can be removed from the autotetraploid populations. In rye which is grown for seed, aneuploids have been reported to greatly affect fertility of autotetraploids³. Similarly, in autotetraploid red clover upto 10% aneuploids were found⁴. The frequency of aneuploids in autotetraploids of *T. foenum-graecum* is expected to decline after further selection.

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Mercury in Fish from Mettur Reservoir

In recent years aquatic environmental pollution due to mercury has become a serious health hazard. Considerable work has been done on the determination of mercury in fish flesh. Matida and Kumada¹ have worked on the distribution of mercury in water, bottom mud and aquatic organisms of Minamata Bay, the river Agano and other water bodies in Japan.

A preliminary investigation was carried out on the incidence of mercury in fish from Mettur Reservoir of the Cauvery river system. Fish samples were collected from the catches of Mettur reservoir, sufficiently iced and brought by thermocol insulated boxes to the laboratory at Coimbatore, preserved in freezer chest and analysed the next day. The mercury in the fish samples was determined according to the method described by Nabrzyski². The results are expressed on wet weight basis.

	Total length (mm)	Weight (gm)	Mercury (ppm)
<i>Mystus aor</i>	370	350	0.250
<i>Notopterus notopterus</i>	340	270	0.086
<i>Cirrhina cirrhosa</i>	335	450	0.047
<i>Labeo calbasu</i>	410	720	0.090
<i>Rhinomugil corsula</i>	330	275	0.085
<i>Puntius sarana</i>	255	250	0.072
<i>Labeo rohita</i>	430	1570	0.027

The maximum permissible level of mercury in foodstuffs as laid down by U.S. Federal Legal Action guidelines is 0.5 ppm.

Our thanks are due to Tamil Nadu State Fisheries Department for suggesting this problem and also for providing the necessary facilities for collection of samples. We also wish to express our sincere thanks to Professor N. V. Choodamani, for the encouragement and for the keen interest he evinced in the course of the work.

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REVIEWS AND NOTICES OF BOOKS

Introduction to Solid State Physics. By C. Kittel. (Fourth Edition, Second Wiley Eastern Reprint), 1974. Pp. xvii + 766. Price Rs. 30.00.

By now the name of Kittel is a by-word in the Solid State Physics Departments all over the world and the book is becoming bulkier each edition. It is good to see that a fairly good reproduction of the fourth edition is coming out for a second reprint which shows the popularity of the book. At rupees thirty it is a good buy. The book is profusely illustrated and the photographs have not suffered too badly in this reprint. One hopes that with reasonably cheap reprints like the present one, students will develop the habit of acquiring a library of their own in the fields of their choice.

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Cours et Documents de Mathematiques et de Physique. Edited by Bruno Morando. (Gordon and Breach Science Pub. Ltd., 41/42, William IV Street, London, W.C. 2), 1975. Pp. xiv + 255. Price : Hardback \$ 12.80, Paper back \$ 4.80.

This book essentially deals with the motion of an artificial satellite about the earth. The study of the motion of earth satellite and their trajectory computation has become an extremely important subject during the last two decades. A significant feature of this book is that it develops the subject-matter step by step from the basic fundamentals and this is most helpful to a beginner in this field. Wherever possible, the basic theorems required to understand the mathematical formulations have also been discussed to enable the reader to follow the subject matter easily.

The book is divided into 14 chapters. Motion of the satellite has been essentially dealt as a two body problem. The earth's oblateness which is the major perturbing force on the movement of the

satellite is discussed in detail. The basic concept of perturbations due to the solar and lunar gravitational attraction, atmospheric drag and radiation pressure on the motion of the satellite are treated in the last chapter. In addition, special problems like the problem of critical inclination and problem of resonance related to geostationary satellites are also explained in detail.

In order to facilitate easy understanding of the subject, the author has adopted Newtonian dynamical description which is familiar to most of the physics students. Expressions for various harmonics related to the perturbing forces, Laplacian coefficients and earth's potential are derived from fundamentals. Legendre polynomials and Bessel functions which form the backbone of celestial mechanics are discussed in detail as a prelude to an easy understanding of the expressions derived for describing the earth's potential and various perturbations. The perturbations due to the zonal and tesseral harmonics are also treated separately in the book.

The extensive references sighted in the bibliography as well as a large number of elegant figures included in the text should go a long way in making this book a very useful one to the students of Astrodynamics and celestial mechanics. A simple and elegant treatment of the subject-matter will also be very useful to the specialist in orbital mechanics, geodesy and geophysics.

U. R. Rao.

Soil Biochemistry (Vols. 3 and 4, Eds. F. A. Paul and Douglas McLaren (Marcel Dekker, Inc., New York), 1975. Pp. 334 and 277. Price \$ 27.50 and \$ 23.75 respectively.

In Vol. 3, there are six Chapters. Chapter 1 on Biochemistry of the Soil Subsystem deals with Plant-microbe and Soil microbe relationships and