engaged in working out the life history which will appear elsewhere.

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HOMO-HETEROTHALLISM IN *MARASMIUS CAMPANELLA* HOLTERM

The phenomena of homothallism and heterothallism are of widespread occurrence among Hymenomycetes. Recently, Whitehouse[6] has shown that of the species so far investigated about 10% are homothallic and the rest heterothallic. Of the heterothallic species, again, about 39% are 'bipolar' and 61% 'tetrapolar'. Besides these three categories, there are also species which show complex sexual reactions as have been shown by Vandendries[5] and Newton[2] in *Coprinus radians* and *C. rostrupianus* respectively. According to them single spore mycelia are heterothallic when young, but becoming homothallic later. This phenomenon has been named by Vandendries[5] as 'hetero-homothallism.' Another remarkable behaviour of producing both homothallic and heterothallic single spore mycelia from the same fruit-body has been reported by Sass[4] in *Coprinus ephemerus* f. *bisporus*, Quintanilha[3] in *Coprinus plagioporus*, and Kuhner & Yen[1] in *Mycena rubromarginata*, but as far as can be seen no such cases have been further recorded in more recent literature. *Marasmius campanella* Holterm., the fungus in question, has been found by the writers to furnish another example of this sort.

The constant occurrence of numerous clamp connections in the polysporous mycelia of *Marasmius campanella* has induced the writers to think that the fungus might be heterothallic in nature. With a view to study the sexual behaviour of the fungus a large number of monosporous cultures have been made from uninucleate and binucleate spores obtained from a single fruit-body in the usual way. But on close examination of more than one hundred mycelia of monosporous origin it is found that in about 94% cases the mycelia obtained from bi-nucleate spores are always associated with clamp-connections, while the remaining 6% mycelia derived from uninucleate spores are without them. The former type of mycelia has produced typical fructifications under cultural conditions while the latter type has failed to do so. These haplont mycelia have been found to react with one another in a very limited number of combinations producing typical secondary mycelia with clamp-connections. These secondary mycelia also have produced typical fruit-bodies of the fungus in culture. Thus, it can be said that in *Marasmius campanella* most single-spore mycelia are homothallic although from each fruit-body a certain number of heterothallic mycelia is also obtained. In other words, the production of fertile sporophores in great majority of cases is independent of the fusion of nuclei from different mycelia.

Nuclear phenomena of spore-germination in the different types of mycelia have also been investigated and the observations will be published elsewhere.

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SOME NEW GENERA OF UNCOILED AMMONITES FROM LOWER CRETACEOUS

In course of my research work on the revision of *Crioceratidae*, I have examined all the principal collections in the different universities and museums of France, as well as the type specimens available of d'Orbigny and others in France, and those of Astier in the Natural History Museum, London. The study of the collections has also been followed by field-work in the French Alps.

The following new genera are the additions to the *Crioceratidae* as a result of my research in France. The original generic descriptions

being in French, English translation of them is furnished below :

Gen. Balearites Sarkar (*Compte Rendu Sommaire des Séances*, Soc. Géol. de France, no. 4, Séance du 15 Ier Février, 1954, page 97).

Dissimilites Gen. nov.
Emericiceras Gen. nov.
Escragnolleites Gen. nov.
Jaubertites Gen. nov.
Moutoniceras Gen. nov.
Spathicrioceras Gen. nov.

Dissimilites Gen. nov.

Variable ornamentation, the ribs being tuberculated and non-tuberculated, generally resembling those of *Emericiceras Gen. nov.* The coiling is a typical one, the hook resembling that of *Hamulina* having the descending branch of it generally long. The spire is probably always rudimentary and is only seen in *D. dissimilis* d'Orbigny (Kilian Montagne de Lure, 1889, page 232). The suture is crioceratic.

Genotype - *D. dissimilis* d'Orbigny *sp*[1].

Emericiceras Gen. nov.

Coiling is crioceratic, which is loose in the beginning and becomes gradually closer with the development of the shell. Ornamentation is always vigorous, the principal ribs trituberculated which are more in number and much prominent, where tubercules are always well developed. The intermediate ribs are less in number being generally 1 to 7. The principal ribs often interrupt on the siphonal side. In the ombilical side the ribs show a bend which is more or less prominent towards the aperture and the principal ribs may subdivide or not. The suture is of the same type as that of *Crioceratites*.

Genotype : *Crioceratites emerici* Léveillé[2].

Gen. Jaubertites nov.

The genus is characterized by whorls which are clearly disjointed but usually closer comparatively. The growth of the shell is rapid which resembles that of *Crioceras fallauxi* Uhlig[3]. The ribs more or less resemble each other and they pass over the siphonal side as well as the ombilical side, without interruption. The tubercules are large or very large, which are situated on several ribs together or also found in regions having no ribs at all. There are 3 ranges of tubercules on each side of the shell which may be all equal or differing in size, sometimes very greatly.

The section is oval or rounded, the lateral sides and the siphonal side are ordinarily convex. The suture is known imperfectly.

Genotype : *J. dubium* Jaubert in coll.

Escragnolleites Gen. nov.

The genus is characterized by simple ribs all equal, the ribs are straight and bear a tubercule on the siphonal side and another which is marginal. The ribs interrupt or not on the siphonal side and they pass over the ombilical side without any bending or any sub-division.

The section is more or less polygonal. The whorls are not jointed but without doubt feebly disjointed. The suture exhibits the first lateral lobe of the Parahoplitic type.

Genotype : *Escragnolleites cristatum* d'Orbigny[4] sp.

Moutoniceras Gen. nov.

The genus is characterized by spire always disjointed very loosely or show an arc of simple curvature. The initial spire seems to be never turrilitoid. The ribbing is of the same type as in the genus *Heteroceras*. The ribs show a *V*-inflexion on the siphonal side, the base of *V* pointing towards the aperture and with the inflexion there is more or less an interruption of the ribs at that point. The suture is not known.

Genotype : *Toxoceras moutonianum* d'Orbigny[5].

Sapthicrioceras Gen. nov

Coiling crioceratic, very loose, the whorls are very flattened. The younger whorls show principal ribs bituberculated (ombilical and lateral). Afterwards all the ribs become equal, nontuberculated. On the later part of the shell all the ribs do not attain the ombilical border but disappear before, more or less quickly. The ribbing is always undulated and the ribs pass over the siphonal side without interruption.

Genotype : *S. sornayi* n. sp.

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DISCOVERY OF A NEW LOCALITY OF MARINE GONDWANA FORMATION NEAR MANENDRAGARH IN MADHYA PRADESH

A marine pebble-bed lying unconformably on Archaean Gneiss has been discovered in a section below the railway bridge on Hesdo river in the Anuppur-Chirimiri section of the Eastern railways. The bridge is 2½ miles from Manendragarh railway station.

The pebble-bed belongs to the Gondwanas of the region and lies at or near the base of the Talchir Boulder Beds.

The fossils so far collected show a few forms belonging to marine Brachiopods, similar to those found in Umaria marine beds.

This discovery opens up the possibility of a greater extension of the Permo-carboniferous marine belt in Madhya Pradesh.

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HIGH YIELDING X-RAY MUTATIONS OF *SESAMUM ORIENTALE* LINN.

Irradiation experiments with X-rays on a number of plants of agricultural importance have been tried by different workers in recent years. A few interesting mutations valuable from the economic point of view, having higher yield, earliness, superior strength of straw and grain weight and other biochemical properties have been reported and these have been summarised by Gustafsson[9]. Extensive work has, however, been done by the Swedish School of Botanists on crop plants like Barley, Wheat, Oat, Flax, Sweet lupin, Soybean, Oil Turnip and White Mustard[10].

Some experiments on the effects of X-rays on agricultural plants have been done in India also. Ramiah and Parthasarathy[7] obtained an ageotropic rice mutation. Kumar and Joshi[6] irradiated ear-heads and flower buds of Bajri (*Pennisetum typhoideum*), mustard and tobacco and did some crossings between X-rayed and normal pollens and stigmas. Ranjan[8] obtained abnormalities in X-rayed wheat which was observed in the second generation as well. Raghavan and Venkatasubban[9] observed morphological changes in the X_1 population of a variety of chilli. But many of these experiments did not prove to be interesting from the economic point of view. But in cotton M.U. 4, individuals with high means for ginning percentage and halo lengths have been reported[5] in the X_2 generation of plants raised from irradiated selffed seeds of a single plant. X_3 progenies grown from such X_2 selections also showed similar high values.

Systematic work on the mutagenic effect of X-rays is being done in this Institute since 1942 on a few important crop plants like jute, cotton, mustard and sesamum. Jacob[4] published a note on the increased height and basal diameter of jute plants grown from irradiated seeds. Chaudhuri[1] has obtained a high yielding red pigmented X-ray mutant of jute (*Corchorus olitorius*) selections from which, continued to give higher yields upto the 7th generation.

Irradiation experiments on Sesamum, which is one of the important oil seed crops of our country were started in 1950 in this Institute.

Out of a number of types obtained from different sources, only six responded favourably under the local conditions and were selected for X-ray experiments with a view to induce mutations with better economic potentialities. The present note deals with the preliminary results obtained in sesamum type No. 12 and sesamum type No. 16 only of West Bengal. Important findings on the effect of X-rays in the other four types will be included in a separate note.

Type No. 12 and type No. 16 are both black seeded varieties and thrive best when sown by the end of March or early April. Dry seeds were exposed to X-rays in the Radiological Laboratory, of the Institute, with the following dosages :

Type No. 12, West Bengal	**36 m.a.H. = 14,400 r units**
	50 m.a.H. = 20,000 r units
Type No. 16, West Bengal	**36 m.a.H. = 14,000 r units**
	50 m.a.H. = 20,000 r units

The irradiated seeds were sown in the field in randomised replicated plots along with controls. Selections in the X_1 generations were