reported by Lucas *et al.*[5] in a girl with chromosomal mosaicism. Also in that case the abnormal chromosome appears to be derived from chromosome No. 18. In some mitoses the abnormal autosome in our case has a certain resemblance also to the abnormal extra chromosome described as a possible isochromosome of the short arm of No. 18 chromosome by Frøland *et al.*[8] in a case of multiple congenital malformations.

The exact interpretation of the result of the karyographic analysis of the present case and of the peculiar phenotypical features seems to be difficult. On the assumption that the abnormal partially ring-shaped chromosome derived from a chromosome No. 18, it could have originated by a process leading not only to a loss of chromosomal material, but also to a concomitant translocation of minor fragments, which cannot clearly be identified. Although the aforementioned similarity of the abnormal chromosome in some of the mitoses (see Fig. 1*a*) to the abnormal extra chromosome described by Frøland *et al.*[8] would perhaps be consistent with the hypothesis of an isochromosome 18 of the short arm, this possibility should be ruled out in the present case. The phenotypical characteristics of our case bear no closer resemblance to the malformation syndrome described in the cases of a ring-chromosome and absence of chromosomes Nos. 16–18 (refs. 2, 4 and 5). The association of a congenital heart anomaly, anomalies of the urinary tract, together with skull deformation and low-set ears, favour the idea of some relation of this case to the syndrome known in cases of *E*-trisomy (trisomy Nos. 17/18) (refs. 1, 9 and 10), even in the absence of a prominent anomaly such as the overlapping of the third digit.

This work was supported by the Deutsche Forschungsgemeinschaft.

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Breeding System and Chromosome Number in *Lotononis bainesii* Baker

Lotononis bainesii Baker is a pasture legume introduced into Australia from South Africa. It has grown well on the sandy soils of the high rainfall areas of south-east Queensland[1] and it has a highly specific *Rhizobium* requirement[2]. As an initial step in a genetic investigation of this plant, the breeding system and the chromosome complement have been investigated.

During the succession of flower development, pollen grains appeared on the surface of the stigma between the time at which the calyx first commenced to open and that when the corolla, in the course of projecting from the calyx, was half the length of the calyx. Pollen tubes were first observed in the stigma after the latter stage. Anthesis clearly occurs at an early stage of flower development, and this cleistogamous habit would explain the apparent lack of variation in field populations of *L. bainesii*.

Chromosome counts made from root tip squashes in acetic–orcein showed a diploid complement of $2n = 36$ for *L. bainesii*. Meiosis was normal in microsporocyte mother cell divisions, with eighteen bivalents formed consistently. Two pairs of satellited chromosomes were found in mitotic divisions.

Taxonomically, *L. bainesii* is placed in the tribe Genisteae, sub-family Papilionaceae of the Leguminoseae. Darlington and Wylie[3] report basic chromosome numbers of $X = 7, 8, 11, 12, 13$ for the Genisteae, but no count was recorded for the genus *Lotononis*. Evolutionary investigations in the Leguminoseae[4] suggest that the higher basic numbers of $X = 11, 12, 13$ in this tribe may have been derived by a process involving reduction in chromosome number from $X = 7$ to $X = 6$, chromosome doubling, and aneuploidy.

Lotononis angolensis (Welw.) and *Listia heterophylla* (E. Mey) (a closely related monospecific genus) both have a somatic chromosome number of $2n = 18$ (Cameron, personal communication). It appears, therefore, that *L. bainesii* is a tetraploid member and that *L. angolensis* and *L. heterophylla* are diploid members of the Genisteae, and that their basic chromosome number is $X = 9$.

A basic number of $X = 9$ is a new one for the Genisteae and may have arisen either by an increase from $X = 8$ to $X = 9$ or by reduction to $X = 5$ with subsequent doubling and aneuploidy. The former hypothesis is more tenable especially since no possible ancestors with $X = 5$ have been discovered. If $X = 8$ is accepted as the primitive basic number of this tribe[4], it appears that in the Genisteae there may have been an evolutionary trend involving increase as well as reduction in basic chromosome number.

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VIROLOGY

Differential Sensitivity of Tobacco Mosaic Virus and its Infectious Nucleic Acid to Fast Electrons

High-speed electrons have been used in a variety of investigations dealing with the action of ionizing radiation on viruses[1] but only whole virus was studied in these instances. The relatively recent finding that the nucleic acid portion of viruses represents the infectious unit has led to comparative investigations of the relative sensitivities of infectious nucleic acid and whole virus to ultra-violet irradiation[2] and X-rays[3]. The availability locally of a linear accelerator has made a comparable investigation with fast electrons possible.

The common, or *U*-1, strain of tobacco mosaic virus[4], highly purified, at $7{\cdot}2 \times 10^{-4}$ mg/ml., and its infectious nucleic acid prepared by the Schramm phenol method, at 9×10^{-2} mg/ml., were used in this work. Inocula were placed in clear test-tubes of 16-mm inner diameter. The test-tubes were placed close to an aluminium plate in the Montana State University Physics Department linear accelerator so that the inocula were bombarded with scattered 5-MeV electrons. Time of exposure was varied to produce doses from 0 to 10^5 roentgens. Inocula containing 15 mg/ml. of 'Celite' were rubbed with ground glass paddles on leaves of *N. glutinosa* using a Latin square method to minimize differences between plants and between various leaf positions on individual plants. Nucleic acid inocula were kept chilled throughout; exposures to radiation were too brief to alter significantly inoculum temperature. Local lesions were counted when they appeared and until their number did not change, normally between 3 and 5 days.