Pyrus communis L. and *P. pashia* Buch-Ham. Moderate degree of resistance was detected in the stocks of *Cotoneaster acuminata* Lindl., *C. bacillaris* Wall. and *Malus baccata* (L.) Borkh. None of the stocks could be rated as resistant to the disease.

The results of inoculations reveal that the plum isolate of *A. tumefaciens* is pathogenic to many plant species, indicating thereby that the disease would be occurring on plants of pome and other stone fruits in Himachal Pradesh. It is a major concern that none of the rootstocks, tested in the present studies, could be evaluated as resistant to the disease. Plants of *C. acuminata* and *C. bacillaris*, identified as moderately resistant to crown gall, may be tried as rootstocks for pear. Availability of moderate degree of resistance in rootstocks of *M. baccata* may help to avoid a situation of crown gall becoming a potential threat to apple cultivation.

Division of Mycology and Plant Pathology,
Indian Agricultural Research Institute,
New Delhi 110 012, *April* 23, 1977.

J. C. DURGAPAL.

1. Durgapal, J. C., *Indian Phytopath.*, 1971, 24 (2), 379.

A PEARL MILLET STRAIN WITH $2n = 12 + 4$ TELOCENTRIC CHROMOSOMES

IN the progeny of an autotriploid *Pennisetum typhoides* (Burm) S and H, in a population of 227 plants, 4 plants showed a deviant karyotype from the normal one. The normal chromosome number for this species is $2n = 14$, but these plants are with chromosome number $2n = 13 + 2$ fragments. These fragment chromosomes on further study proved to be telocentrics. At mitotic metaphase these two fragment chromosomes showed terminal centromeres and they corresponded in their lengths to the two arms of one of the odd chromosomes in the complement which was the longest chromosome of the complement with sub-median centromere. The two telos were slightly unequal in size. At meiosis these two telos paired with one of the normal chromosomes to form a heteromorphic trivalent. This trivalent was always a chain type with the two telos associated with the two arms of the normal chromosome. They were never observed to pair among themselves. At metaphase I, the orientation of the trivalent was non-random and resulted at Anaphase I segregation with the normal chromosome moving to one pole and the two telos to the other pole (62%).

When these plants were selfed, in the progeny plants with $2n = 12 + 4$ telos were obtained together with aneuploids and diploids (Table I).

TABLE I

Chromosome constitution of plants in the progeny of a plant with 13 + 2 *telos*

Chromosome constitution	14	13+2 telos	12+4 telos	14+1 telos	Total
Number of plants	12	51	14	1	78

The plants with 12 + 4 telos are of interest. These plants are obviously the result of the union of gametes with chromosome numbers $n = 6 + 2$ telos. In these plants two of the telos were longer than the other two telos. The four telos regularly formed two rod bivalents at Diakinesis and Metaphase I (Table II) (Figs. 1, 2 and 3).

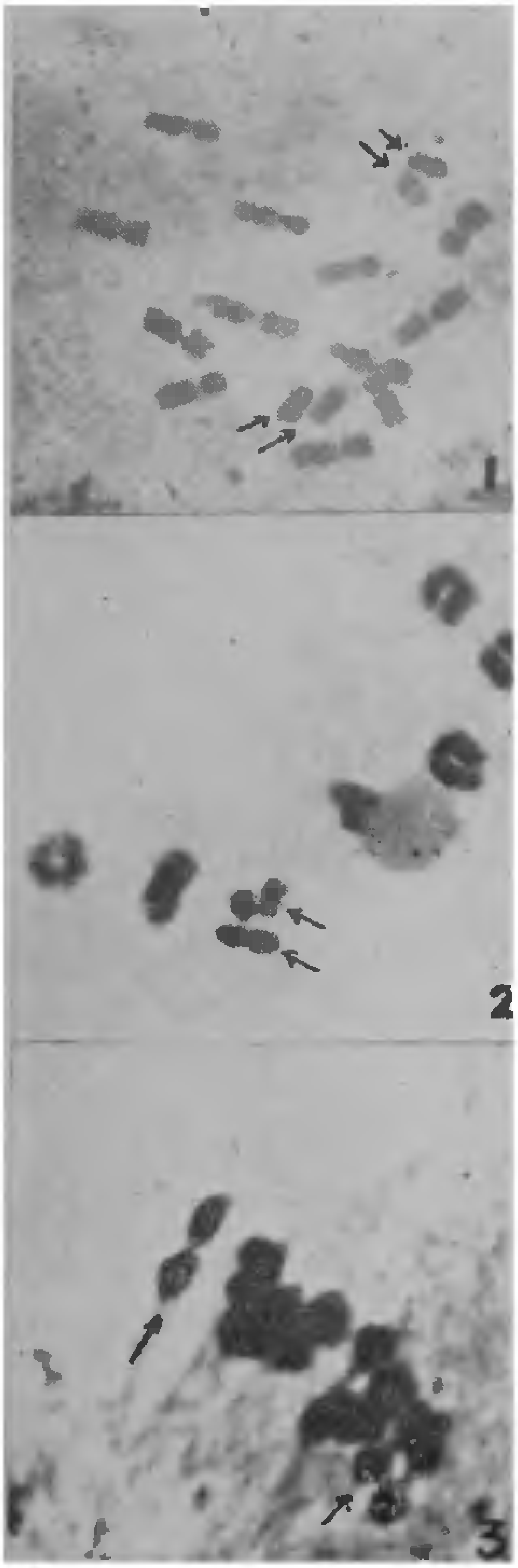
In 364 cells out of 396 cells observed at Diakinesis, the 4 telos regularly formed 2 rod bivalents and in 31 cells they formed 1 bivalent + 2 univalents. Only in 1 cell, the four telos remained as univalents. The mean chiasma frequency per cell at Diakinesis was 12·803 and the variance was 1·066.

TABLE II

Summary of chromosome associations in plants with 12+4 *telocentric chromosomes*

Stage of Meiosis	Normal chromosomes			Telocentrics		Total number of cells
	Bivalents		Univalents	Bivalents	Univalents	
	Ring	Rod				
Diakinesis	4·742	1·132	0·035	1·922	0·156	396
Metaphase I	3·896	1·821	0·434	0·963	0·433	106

At Anaphase I the distribution of chromosomes observed were 8–8 and 9–7 with frequencies 59 and 10 respectively in a total of 69 cells examined.



FIGS. 1–3. *Pennisetum typhoides* (Burm) S & H. Fig. 1. Karyotype showing $2n = 12 + 4$ telos (Arrows indicating the two pairs or telos). Fig. 2. Diakinesis showing 5 ring bivalents and 3 rod bivalents of which two are formed by telos. Fig. 3. Metaphase I showing 6 bivalents formed by standard chromosomes and two by telos.

The transmission frequencies of the telos from the male and the female side were determined by performing reciprocal crosses with normal diploids. The results are presented in Table III.

TABLE III

Chromosome constitution of the progeny plants obtained in crossing and selfing of plants with chromosome number $2n = 12 + 4$ *telos*

Cross	13+2 telos	13+3 telos	12+4 telos	Total
12 + 4 × 14	48	1	..	49
14 × 12 + 4	22	..	..	22
12+4 selfed	..	..	23	23

For four generations in selfing the plants with chromosome number $2n = 12 + 4$ telos gave rise to progeny plants with $2n = 12 + 4$ telocentric chromosomes only. That is this karyotype has become stable with telocentrics. These plants in their morphology were not different from the diploid sibs or from the plants with chromosome number $2n = 13 + 2$ telos.

Over the question of stability of telocentric chromosomes which arose either spontaneously or in experiments, there was some controversy. Nawaschin[1] was the first to suggest that the chromosomes with strictly terminal centromeres could not survive in nature and for many years this remained the generally accepted view. It was argued by those who rejected the concept of telocentric condition, that all stable rod chromosomes were acrocentric and the evidence available at the time seemed to support this interpretation. Thus it was believed that minute heads which are often seen at the centric end of the rods clearly demonstrated the existence of short arms (Darlington[2], White[3]). It was also pointed out that when telocentrics either arose spontaneously (Upcott[4]) or following X-ray irradiation (Rhoades[5]), through the fracture of the interstitial centromere, their unstable behaviour usually led to their rapid elimination.

With the improvement of the techniques of chromosome analysis, there has been evidence that not all such chromosomes are acrocentric. With the available information on the structural organization of the centromere (Lima-de-Faria[6]), with a degree of certainty it has been shown that in many rod chromsomes, the so called 'small arms' represent fused centromeric chromomeres (Southern[7]). In addition there are now several recorded examples of derived telocentrics in plants which are stable (Darlington and La Cour[8]; Marks[9]; Strid[10]; Tsunewaki[11] and Tsuchiya[12]). It was further suggested that telocentrics are rare not because their centromeres are inefficient but because they have a low chance of survival on account of genetic imbalance, it is likely that many of the cells die (Marks[9]).

In the present material, the presence of four telocentrics in place of two full chromosomes makes the chromosome complement full and their presence is not affecting either the exophenotype or the endophenotype. Their behaviour clearly shows the genetically well balanced structure of this strain. The meiosis is normal giving rise to genetically balanced gametes largely. Thus the telocentrics in this strain could be stable.

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Department of Botany, Andhra University, Waltair 530003, India, *December* 3, 1976.

J. V. PANTULU. G. J. NARASIMHA RAO.

1. Nawaschin, S. G., *Timirjasseffs Festschrift*, 1916, p. 185.
2. Darlington, C. D., *J. Genet.*, 1936, **33**, 465.
3. White, M. J. D., *Proc. Roy. Soc.*, 1935, **B 119**, 61.
4. Upcott, M. B., *Ibid.*, 1937, **B 124**, 336.
5. Rhoades, M. M.. *Genetics.*, 1936, **21**, 491.
6. Lima-de-Faria, A., *Hereditas* (Lund.), 1956, **42**, 85.
7. Southern, D. I., *Chromosoma (Berl.)*. 1969, **26**, 140.
8. Darlington, C. D. and Lacour, L. F., *Heridity*, 1950, **4**, 217.
9. Marks, G. E., *Amer. Naturalist*, 1957, **91**, 223.
10. Strid, A., *Bot. Not (Lund.)*, 1968, **121**, 153.
11. Tsunewaki, K., *Can. J. Genet. Cytol.*, 1963, **5**, 462.
12. Tsuchiya, T., *Cereal Research Commu.*, 1973, **1** (3), 23.

A NEW SPECIES OF *MICROPERA* LEV. (COELOMYCETES) FROM MAHARASHTRA (INDIA)

A RARE but interesting pycnidial fungus belonging to the form-genus *Micropera* Lev. (Form O. sphaeropsidales) was recently collected at Poona growing on *Kickxia ramosissima* (Wall.) Janchen. (Fam. Scrophulariaceae) well known for its medicinal properties. On detailed study of its morphology and dimensions the fungus proved to be quite distinct from all other known species of the form-genus including *M. indica* Paw. and Kulk[1]. Hence, the same has been described here as a new species, with Latin diagnosis thus:

Micropera suttonii sp. nov. (Fig. 1)

Stromata atro-fusca, sub-erumpentia, dispersa, pycnidia dispersa, multi-loculata (2–3), crassiusculae ostiolata, immersa in plantis textibus, pezizoidea, magnitudine, 290–360 μm in diam. Pycnidiophora brevia, simplicia, hyalina vel sub-hyalina. Pycnidiospores cylindraceo-fusoidea, 3–5 septata, curvata vel flexa, hyalina vel olivacea, magnitudine, 58–86 × 3·3–4·2 μm.

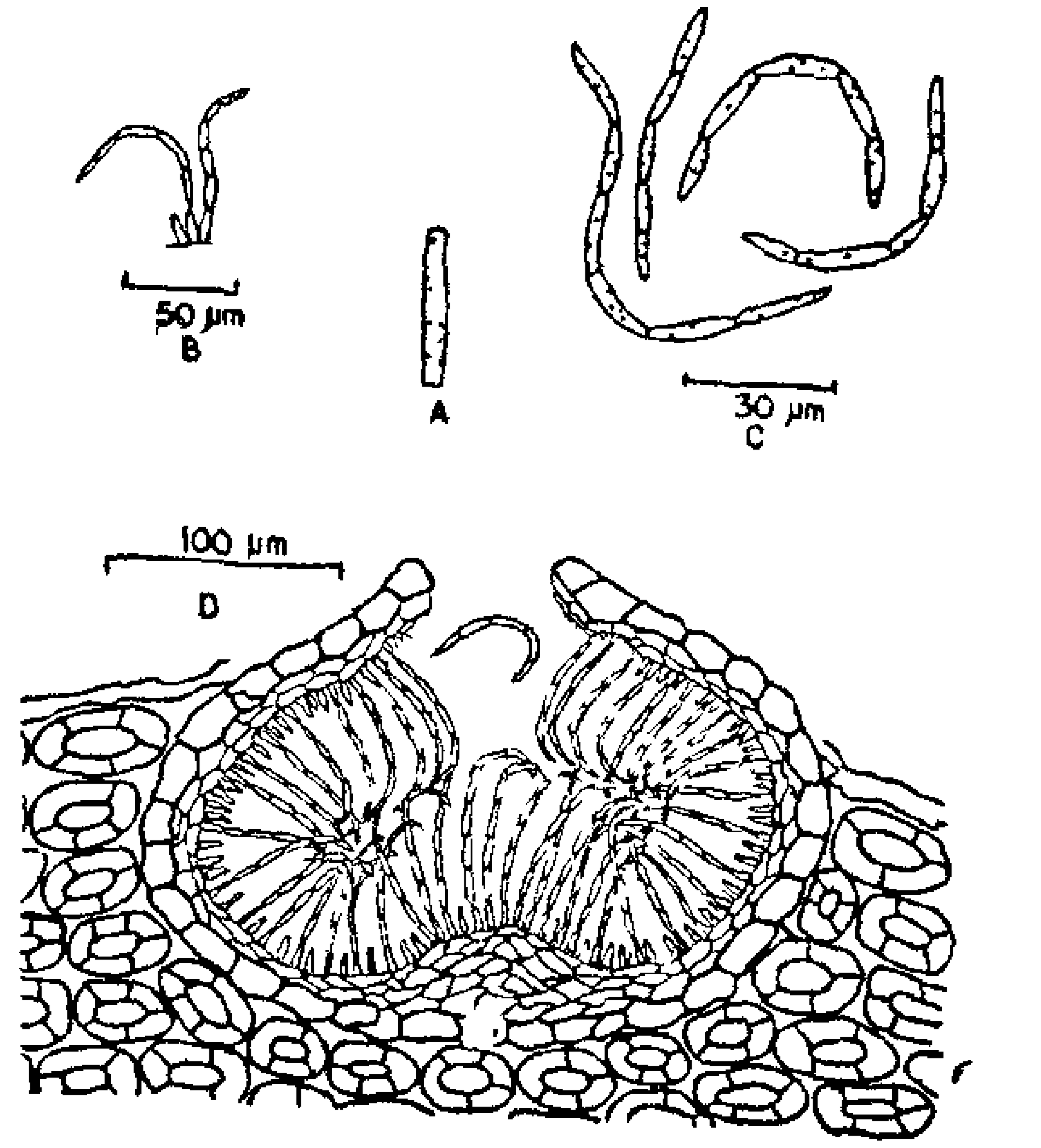

FIG. 1. *Micropera suttonii* sp. nov. A, Habit; B, Conidiophores; C, Pycnidiospores; D, V.S. of Pycnidium.

Matrix: In culmis viventibus *Kickxia ramosissima* (Wall.) Janchen. (Fam. Scrophulariaceae), ad Poona, India, 26–6–1976, legit B. R. Dayakar Yadav. No. AMH 3388 (Holotypus).

The specific epithet has been chosen in honour of Dr. B. C. Sutton, Mycologist, C.M.I., Kew, England, in recognition of his notable contributions to Coelomycetes.

Discussion

On critical study of morphological features of the 16 known species of *Micropera* Lev., the pycnidiospores of the present collection were found to be significantly bigger in size being 58–86 × 3·3–4·2 μm and hence the fungus is presented here as a new species. The fungus constitutes the 2nd report from Maharashtra.

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M.A.C.S. Research Institute, Poona 411 004 (India), *February* 23, 1977.

B. R. DAYAKAR YADAV. V. G. RAO.

1. Pawar, I. S. and Kulkarni, U. K., *J. Bombay Nat. Hist. Soc.*, 69 (2), 457.