‘Marys Peak’ Strawberry

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Additional index words. Fragaria ×ananassa, short-day, June-bearing, processing, fresh market, harvest efficiency

‘Marys Peak’ is a new June-bearing (short-day) strawberry (Fragaria ×ananassa Duchesne ex Rozier) cultivar from the U.S. Department of Agriculture-Agricultural Research Service (USDA-ARS) breeding program in Corvallis, OR, released in cooperation with the Oregon Agricultural Experiment Station. The most outstanding characteristic of ‘Marys Peak’ is its excellent fruit quality as a processed or fresh product. Its flavor, size, firmness, color, low incidence of botrytis fruit rot (Botrytis cinerea Pers.), and yield are particularly notable. A U.S. plant patent application (S.N. 15/330,507) has been submitted.

Origin

‘Marys Peak’ was selected in 2002 from the cross ‘Pinnacle’ × ORUS 1723-3 made in 2000 and was tested as ORUS 2427-4 (Fig. 1). The purpose of the cross was to combine the large fruit size and open plant architecture of ‘Pinnacle’ with the outstanding fruit quality characteristics of ORUS 1723-3 (Finn et al., 2004). Although the cultivar ‘Pinnacle’’s pedigree predominantly represents a mixing of Northwest and California germplasm, ORUS 1723-3’s pedigree is extremely diverse including eastern, southeastern, and Ecuadoran Fragaria chiloensis L., through Ambato (aka ‘Huachi’), in addition to germplasm from the Pacific Northwest and California (Finn et al., 1998; Hancock et al., 1996; Sjulin and Dale, 1987). ‘Marys Peak’ was tested at the Oregon State University–North Willamette Research and Extension Center (OSU-NWREC, Aurora, OR), Washington State University Puyallup Research and Extension Center (WSU-Puyallup, Puyallup, WA), and Agriculture and Agri-Food Canada (AAFC, Abbotsford, BC), Pacific Agri-Food Research Center and grower fields in Oregon. The most thorough commercial testing was conducted at Grandpa’s Fresh Market (Albany, OR), Stallbush Island Farms (Corvallis, OR), and Townsend Farms (Forest Grove, OR). At the public research facilities, ‘Marys Peak’ was planted in multiple replicated trials established from 2010 to 2014.

In all research trials, the plants were grown in a matted row system, the predominant commercial system in the Pacific Northwest. Plants were established in non-fumigated eight-plant plots at 46 cm apart within the row in Oregon and British Columbia and 38 cm apart in Washington. The trials had three replications. At the OSU-NWREC, fertilizer (350 kg·ha–1 of N; 16N–7P–13.3K) was applied after renovation (mowing off the old leaves after harvest, generally in late July) and again in spring (175 kg·ha–1 of N). Herbicides were applied at planting and in spring, late July, and autumn of the fruiting years, as required, per standard commercial practice (DeFrancesco, 2017). The planting received ≈2.5–5.0 cm of water per week either as overhead irrigation or rainfall. There were two fungicide applications (one each of azoxystrobin and cyprodinil/difolinoxim) during bloom to control botrytis fruit rot (B. cinerea Pers. Fr.), but the plantings received no other pesticide applications. Ripe fruits were harvested once a week. The average fruit weight for a season was calculated as a weighted mean based on the weight of a randomly selected subsample of 25 fruit from each harvest. The weighted mean was calculated by multiplying average berry weight for each week of harvest by the proportion of total yield picked that week; the values were then summed. In multiple-year trials, yield, average fruit weight, and average fruit rot were analyzed as a split-plot in time with year as the main plot and cultivar as the subplot. Fruit firmness was measured in the WSU-Puyallup trials as the force required for a 4-mm-diameter cylinder (Hunter Spring Mechanical Force Gauge Series L; Ametek, Hatfield, PA) to penetrate to a depth of 6 mm in five randomly selected fruit from each harvest. The average fruit firmness for a season was calculated as a weighted mean similarly to the average fruit weight. The plantings and the analyses (PROC GLM; SAS Institute, Cary, NC) included the industry standards ‘Tillamook’ and ‘Totem’ along with the recent releases ‘Charm’ and ‘Sweet Sunrise’ and other advanced selections or cultivars being evaluated for adaptation (Finn et al., 2004, 2013, 2014). Plant vigor and fresh fruit characteristics including appearance, firmness, external and internal color, capping (ease with which the calyx was removed), and flavor were rated subjectively at least three times each year in Oregon using a 1 to 9 scale (1 = poor vigor, uneven rough appearance, soft fruit, very light-colored, poor separation of calyx from receptacle, and poor flavor and 9 = very vigorous, very uniform and attractive, very firm, dark red, calyx separates easily from the receptacle, and intense flavor, respectively) similar to those described by Mathey et al. (2013). In multiple years, duplicate
subsamples of ≈200 g each were taken randomly from frozen and thawed harvested fruit and were evaluated for percent soluble solids, pH, and titratable acidity in the laboratory (Mathey et al., 2013). Fruit samples of ‘Marys Peak’, ‘Sweet Sunrise’, ‘Tillamook’, and ‘Totem’ were analyzed for anthocyanin concentrations using previously described procedures (Lee and Finn, 2007) with a longer high-performance liquid chromatography column (Synergi Hydro-RP 80 Å, 250 mm x 2 mm, 4 μm; Phenomenex, Torrance, CA). Fruit were also evaluated informally as a thawed, individually quick frozen (IQF) product by growers, processors, and researchers. In these informal evaluations, growers were asked to rate samples as either “would plant this genotype,” “not sure,” or “would discard this genotype” and then to make any comments they felt appropriate. We have found that these types of evaluations are not necessarily that valuable individually, but over the course of the years a genotype is in evaluation, an accumulation of positive or negative impressions has been useful in making release decisions.

**Description and Performance**

‘Marys Peak’ had good yields in nearly all trials with yields comparable with or higher than recent releases ‘Charm’ and ‘Sweet Sunrise’ or the industry standards ‘Tillamook’ and ‘Totem’ in each location (Tables 1 and 2) (Daubeney et al., 1993; Finn et al., 2004, 2013, 2014). In Oregon trials, ‘Marys Peak’ had mean yields that were consistently at or near the top for the cultivars in trial (Table 1). In the second year harvest of the 2013 planted field, the yields for all cultivars were much lower than for ‘Sweet Sunrise’ because of ideal, warm, and wet conditions for leather rot [Phythophthora cactorum (Lebert & Cohn) Schröb] development that the early ripening ‘Sweet Sunrise’ escaped. In Washington, ‘Marys Peak’ was comparable in yield with all other cultivars in trial in the first harvest season and with all cultivars except ‘Charm’ in the second harvest season (Table 2). In British Columbia, ‘Marys Peak’ had the highest or second highest yield in both years and was comparable with ‘Tillamook’ and ‘Totem’ but greater than ‘Rainier’ in both years and greater than ‘Sweet Sunrise’ in year two (Table 2). Although not always significant, in nearly every trial at all three locations over each year of evaluation, ‘Marys Peak’ was either the lowest or among the lowest for fruit lost to fruit rot (B. cinerea) (Tables 1 and 2). The low incidence of fruit rot was not that surprising as ‘Marys Peak’ is later ripening than all of the standard cultivars in Oregon and most of the standards in Washington. ‘Marys Peak’ had less than 3% rot in

| Cultivar | Yr 1 | Yr 2 | Fruit wt (g)a | Fruit rot (%) | Yield (kg-ha–1) |
|----------|------|------|---------------|---------------|----------------|
| Charm    |      |      |               |               |                |
| Marys Peak|      |      |               |               |                |
| Tillamook|      |      |               |               |                |
| Totem    |      |      |               |               |                |

| Cultivar | Yr 1 | Yr 2 | Fruit wt (g)a | Fruit rot (%) | Fruit firmness (g) | Yield (kg-ha–1) |
|----------|------|------|---------------|---------------|-------------------|-----------------|
| Charm    |      |      |               |               |                   |                 |
| Marys Peak|      |      |               |               |                   |                 |
| Tillamook|      |      |               |               |                   |                 |
| Totem    |      |      |               |               |                   |                 |

Note: Means within a column and within a location followed by the same letter are not significantly different, P < 0.05, by least significant difference test.

Table 1. Yield, fruit weight, and percent fruit rot for ‘Marys Peak’ and other strawberry cultivars in five replicated trials at Oregon State University–North Willamette Research and Extension Center.
Washington, which is remarkable, especially when compared with ‘Puget Crimson’ and ‘Valley Sunset’, which have a similar late ripening season. In British Columbia, fruit rot was also very low for ‘Marys Peak’ especially compared with ‘Rainier’ in the second harvest season. Our program has purposely selected plants with an upright and open architecture, as is the case for ‘Marys Peak’, to facilitate efficient fruit harvest and a side benefit of this architecture may be a lower incidence of fruit rot (Finn et al., 2004, 2014). ‘Marys Peak’ fruit were typically medium to large sized (Figs. 2 and 3; Tables 1 and 2). In every harvest season in Oregon, Washington, and British Columbia, the fruit weight was greater than that of ‘Totem’, although the difference was not always significant (Tables 1 and 2). In Washington, the fruit were heavier than ‘Totem’, ‘Hood’, and ‘Puget Reliance’ but comparable with ‘Tillamook’ in the first year’s harvest and lighter than ‘Tillamook’ in the second harvest season. In British Columbia, ‘Marys Peak’ was smaller than ‘Tillamook’ in both harvest years but ‘Marys Peak’ was only larger than ‘Totem’ in the second season. In commercial fields, yield and fruit size for ‘Marys Peak’ were considered to be commercially viable for pickers to efficiently harvest the crop and for growers to make grade standards at the processing plants.

‘Marys Peak’ has excellent overall fresh fruit quality (Tables 2 and 3). ‘Marys Peak’ was firm at WSU-Puyallup where fruit firmness was measured objectively in each year of trial (Table 2). At WSU-Puyallup, ‘Marys Peak’ was firmer than ‘Hood’ and ‘Puget Reliance’ in the first and second harvest seasons, respectively, and was numerically at or near the top for firmness in each year. The firmness values were generally reflective of observed fruit firmness; ‘Marys Peak’ was consistently noted for its firmness during subjective evaluations at AAFC. In subjective trials over several years and several plantings in Oregon, ‘Marys Peak’ fruit were rated firmer than all cultivars except ‘Tillamook’ (Table 3). Although not scored, the fruit epidermis is as abrasion resistant as that of ‘Tillamook’ and better than ‘Totem’ or...
‘Hood’. The fruit were not rated to be as attractive and symmetrical as those of ‘Puget Reliance’, ‘Valley Red’, ‘Charm’, and ‘Totem’, or as poorly as ‘Hood’ and were comparable with ‘Sweet Sunrise’, ‘Puget Crimson’, and ‘Tillamook’ (Table 3; Fig. 2). ‘Pinnacle’, a parent of ‘Marys Peak’, was noted for a relatively high rate of fruit deformities due to uneven achene set (Finn et al., 2004) and although ‘Marys Peak’ can have fruit deformities, they were much less common than for ‘Pinnacle’. ‘Marys Peak’ fruit had excellent, uniform, and ideal external color, typically darker than ‘Puget Reliance’, ‘Sweet Bliss’, ‘Charm’, ‘Tillamook’, and ‘Totem’, and comparable with ‘Hood’, ‘Puget Crimson’, ‘Sweet Sunrise’, and ‘Valley Red’ (Table 3). The fruit were uniformly deep, bright red when cut open, comparable with ‘Hood’, ‘Puget Crimson’, ‘Sweet Sunrise’, and ‘Valley Red’ and darker than ‘Charm’, ‘Puget Reliance’, ‘Tillamook’, and ‘Totem’ (Table 3). In research evaluations, the fruit were rated as easily capped as ‘Sweet Sunrise’, ‘Totem’, ‘Hood’, and ‘Tillamook’ but not as easy capped as ‘Valley Red’, ‘Puget Crimson’, or ‘Charm’ (Table 3). ‘Marys Peak’ fruit tasted very good with a good acid to sweetness balance (Table 3). ‘Marys Peak’ fruit were rated similarly to those of all the cultivars in trial but better than ‘Tillamook’ and ‘Valley Red’. Although the flavor scores were good for ‘Marys Peak’, as with ‘Tillamook’, it benefits from picking as infrequently as possible so that sugars have a chance to accumulate to the greatest extent possible between harvests.

As part of the breeding program, thawed, IQF fruit of each genotype were evaluated by a panel composed of researchers and industry members annually in the off-season. In all
evaluations, ‘Marys Peak’ was rated excellent and in 2016 the fruit were rated higher than ‘Sweet Sunrise’, ‘Hood’, ‘Charm’, ‘Tillamook’, and ‘Totem’ (data not shown). The fruit chemistry values for ‘Marys Peak’ were good and acceptable for commercial processing (Table 4). The percent soluble solids for ‘Marys Peak’ was not as high as for ‘Hood’, ‘Benton’, or ‘Puget Crimson’ but was higher than that for ‘Charm’, ‘Stolo’, ‘Sweet Bliss’, ‘Tillamook’, and ‘Valley Red’. Ideally, fruit for processing have a pH near 3.50 (Wrostat et al., 2008). In the years of trial, fruit pH was lower for ‘Marys Peak’ than for ‘Sweet Sunrise’, ‘Stolo’, and ‘Hood’ and comparable with the other cultivars in trial (Table 4). ‘Marys Peak’ had a medium titratable acidity, lower than that of ‘Sweet Bliss’, higher than that of ‘Sweet Sunrise’, and comparable with most other cultivars. ‘Marys Peak’ had the lowest anthocyanin concentration (24.2 mg/100 g) of the four cultivars compared (Table 5). The anthocyanin profile of ‘Marys Peak’ fruit was similar to those of ‘Sweet Sunrise’, ‘Totem’, and ‘Tillamook’; each had all five anthocyanins represented with pelargonidin-3-glucoside being the chief anthocyanin (>87% of the total anthocyanins in ‘Marys Peak’). ‘Marys Peak’ strawberry contained a slightly higher proportion of cyanidin-based anthocyanins than ‘Totem’ or ‘Tillamook’.

‘Marys Peak’, although not considered late ripening, was later ripening than the current standards (‘Hood’, ‘Totem’, and ‘Tillamook’) in Oregon (Table 6). In Washington, ‘Marys Peak’ ripened with the other standard cultivars in the midseason. In Oregon, the slightly later ripening is considered a potential disadvantage for growers as the fruit harvest may overlap with early ripening blueberries creating competition for scarce labor. The harvest interval for ‘Marys Peak’ was comparable with most other cultivars in the trial (Table 6).

‘Marys Peak’ plants were vigorous and were considered not as vigorous as ‘Charm’ and ‘Sweet Sunrise’, comparable in vigor with ‘Puget Crimson’, ‘Valley Red’, and ‘Totem’, and more vigorous than ‘Tillamook’ (Fig. 4; Table 3). Although vigorous, the plant architecture was more similar to ‘Tillamook’, which is upright and open with fewer crowns per plant than ‘Charm’, which is dense with many crowns (Finn et al., 2013). Although not screened for any particular disease resistance in the Pacific Northwest, the plants held up well through the second harvest season and appear to have good virus tolerance. Under our minimal pest-control program, ‘Marys Peak’ did not show any particular susceptibility to pests. In bench screening tests conducted by AAFC (Kentonville, NS), ‘Marys Peak’ plants were susceptible to Phytophthora fragariae Hickman races Cdn-4 and Cdn-5, although not highly susceptible (data not shown). In container bench trials conducted by California Polytechnic State University (San Luis Obispo, CA), ‘Marys Peak’ was moderately susceptible to the soil-borne pathogens Macrophomina phaseolina and Fusarium oxysporum f. sp. fragariae and tolerant to Verticillium dahliae in two inoculation trials (data not shown).

The most outstanding characteristic of ‘Marys Peak’ was its excellent fruit quality as a fresh or processed product. Its flavor, size, firmness, color, low incidence of fruit rot, and yield were particularly notable. These characteristics make it well suited for the fresh or processed fruit markets.

### Table 3. Mean scores over 9 years for characteristics subjectively evaluated in the field for ‘Marys Peak’ and nine other strawberry cultivars planted at Oregon State University–North Willamette Research and Extension Center.

| Cultivar          | Plant vigor | Appearance | Firmness | External | Internal | Capping | Flavor | Color |
|-------------------|-------------|------------|----------|----------|----------|---------|--------|-------|
| Charm             | 8.5 a       | 7.4 cd     | 8.2 b    | 7.4 cd   | 7.2 ab   | 6.4 cd  | 7.2 b  | 7.3  |
| Hood              | 6.7 c       | 6.6 f      | 7.7 a    | 7.7 a    | 7.4 ab   | 7.9 ab  | 7.8 a  |
| Marys Peak        | 7.5 bc      | 8.2 a      | 7.7 a    | 7.7 a    | 7.2 cd   | 7.5 ab  | 7.5 a  |
| Puget Crimson     | 7.4 b–d     | 7.7 bc     | 7.7 a    | 8.2 a    | 7.4 cd   | 7.6 7   | 7.8 a  |
| Puget Reliance    | 7.1 de      | 8.5 a      | 7.1 d    | 6.5 d    | 7.8 a–c  | 7.0 b–d | 7.5 a  |
| Sweet Bliss       | 6.7 c       | 7.6 b c    | 7.6 a    | 7.5 b    | 7.5 b–d  | 7.5 a   |        |
| Sweet Sunrise     | 8.4 a       | 7.2 de     | 7.8 a    | 7.7 a    | 7.1 d    | 7.5 a   |        |
| Tillamook         | 7.0 bc      | 8.0 a b    | 7.3 cd   | 7.2 bc   | 7.1 d    | 6.7 e   |        |
| Totem             | 7.2 cd      | 7.6 cd     | 7.4 cd   | 7.3 b    | 7.8 a–c  | 7.2 b–d |        |
| Valley Red        | 7.7 b       | 8.3 ab     | 7.2 de   | 7.9 a    | 8.3 a    | 6.8 de  |        |

*Traits scored on a 1 to 9 scale: 1 = poor vigor, uneven rough appearance, soft, very light-colored, poor separation of calyx from receptacle (“capping”), and poor flavor and 9 = very vigorous, very uniform and attractive, very firm as manually evaluated, dark red, calyx separates easily from the receptacle, and intense flavor, respectively.

*Means within a column followed by the same letter are not significantly different, P > 0.05, by least significant difference test.

### Table 4. Soluble solids, pH, and titratable acidity for fruit purees of 11 strawberry cultivars grown at the Oregon State University–North Willamette Research and Extension Center from 2004 to 2015.

| Cultivar | Soluble solids (Brix)* | pH (g·L⁻¹ as citric acid) | Titratable acidity |
|----------|------------------------|---------------------------|--------------------|
| Oregon   |                        |                           |                    |
| Benton   | 9.47 a                 | 3.39 c–e                  | 10.01 a–c          |
| Charm    | 7.52 d                 | 3.35 e                    | 9.49 b–d           |
| Hood     | 9.99 a                 | 3.51 ab                   | 8.47 d-f           |
| Marys Peak | 8.74 b                | 3.39 c–e                  | 9.34 b-d           |
| Puget Crimson | 9.78 a            | 3.66                      | 10.47 ab           |
| Puget Reliance | 8.23 b–d       | 3.37 c–e                  | 9.63 b–d           |
| Shuksan  | 8.26 b–d              | 3.39 c–e                  | 10.08 a–c          |
| Stolo    | 7.90 c–e              | 3.50 a b                  | 8.08 ef            |
| Sweet Bliss | 7.93 c–e         | 3.35 b                     | 11.06 a            |
| Sweet Sunrise | 8.42 b c     | 3.54 a                     | 7.58 f             |
| Tillamook | 7.74 c–e            | 3.44 b–e                  | 9.04 c–e           |
| Totem    | 8.51 bc               | 3.47 a–d                  | 8.92 c–e           |
| Valley Red | 7.30 c               | 3.47 a–c                  | 8.60 d-f           |

*Means within a column followed by the same letter are not significantly different, P > 0.05, by least significant difference test.

### Table 5. Anthocyanin concentrations (mg of cyanidin-3-glucoside/100 g) of fruit ‘Marys Peak’ and three standard strawberry cultivars harvested in 2014 from a trial at Oregon State University–North Willamette Research and Extension Center. Anthocyanins are listed in the order of high-performance liquid chromatography elution. Values in parentheses are proportions of the total anthocyanins.

| Cultivar          | Cyanidin-3-glucoside | Pelargonidin-3-glucoside | Pelargonidin-3-rutinoside | Cyanidin-3-malonyl-glucoside | Pelargonidin-3-malonyl-glucoside | Total |
|-------------------|----------------------|--------------------------|---------------------------|-----------------------------|---------------------------------|-------|
| Marys Peak        | 1.07 (4.4)           | 27.12 (87.2)             | 0.97 (4.0)                | 0.05 (0.2)                  | 1.01 (4.2)                      | 24.22 |
| Sweet Sunrise     | 2.30 (6.6)           | 30.14 (87.0)             | 2.12 (6.1)                | 0.02 (0.2)                  | 0.05 (0.1)                      | 34.63 |
| Totem             | 0.90 (2.2)           | 36.26 (86.6)             | 0.79 (1.9)                | 0.22 (0.5)                  | 3.68 (8.8)                      | 41.85 |
| Tillamook         | 0.92 (3.5)           | 24.69 (93.5)             | 0.67 (2.5)                | 0.09 (0.3)                  | 0.04 (0.1)                      | 26.40 |
viruses by enzyme-linked immunosorbent assay and negative for Strawberry mottle, Strawberry veinbanding, Strawberry crinkle, Strawberry pallidosis, Strawberry polerovirus-1, Strawberry latent ringspot, Beet pseudo yellows, and F. chiloensis latent viruses in reverse transcription-polymerase chain reaction assays, phytoplasmas in polymerase chain reaction assays, and have indexed negative when grafted onto Fragaria vesca L. cv. Alpine. Further information on licensing or a list of nurseries propagating ‘Marys Peak’ are available on written request to C. Finn, as is contact information for commercial laboratories that are able to genetically fingerprint vegetative tissue to determine whether a genotype is ‘Marys Peak’. The USDA-ARS does not have commercial quantities of plants to distribute. In addition, plants of this release have been deposited in the National Plant Germplasm System, accession number CFRA 2296 (PI 682649), where they will be available for research purposes, including development of new cultivars.

**Literature Cited**

Daubeny, H.A., F.J. Lawrence, and P.P. Moore. 1993. ‘Totem’ strawberry. Fruit Var. J. 47:182–184.

DeFrancesco, J. 2017. Strawberries. In: E. Peachey (ed.). Pacific Northwest weed management handbook. Oregon State Univ., Corvallis, OR. 13 June 2017. <https://pnwhandbooks.org/weed/horticultural/small-fruits/strawberries>.

Finn, C.E., J.F. Hancock, and C. Heider. 1996. A history of the Ecuadorian strawberry, Huachi (Ambato). HortScience 31:610.

Finn, C.E., P.P. Moore, B.M. Yorgey, J. Lee, B.C. Strik, C. Kempler, R.R. Martin, A.R. Jamieson, and G.J. Galletta. 2013. ‘Charm’ strawberry. HortScience 48:1184–1188.

Finn, C.E., B.C. Strik, B.M. Yorgey, T.A. Mackey, P.P. Moore, M. Dossett, C. Kempler, R.R. Martin, A.R. Jamieson, and G.J. Galletta. 2014. ‘Sweet Sunrise’ strawberry. HortScience 49:1088–1092.

Finn, C.E., B. Yorgey, B.C. Strik, and P.P. Moore. 2004. ‘Tillamook’ and ‘Pinnacle’ strawberries. HortScience 39:1487–1489.

Hancock, J.F., C.E. Finn, and C. Heider. 1996. A history of the Ecuadorian strawberry, Huachi (Ambato). HortScience 31:610.

Lee, J. and C.E. Finn. 2007. Anthocyanins and other polyphenolics in American elderberry (Sambucus canadensis) and European elderberry (S. nigra) cultivars. J. Sci. Food Agr. 87:2665–2675.

Mathey, M.M., S. Mookerjee, K. Gündüz, J.F. Hancock, A.F. Iezzoni, L.L. Mahoney, T.M. Davis, V.M. Whitaker, D.J. Sargent, B. Denoyes, I. Amaya, E. van de Weg, and C.E. Finn. 2013. Large-scale standardized phenotyping of strawberry in RosBREED. J. Amer. Pomol. Soc. 67:205–216.

Sjulin, T.M. and A. Dale. 1987. Genetic diversity of North American strawberry cultivars. J. Amer. Soc. Hort. Sci. 11:458–464.

Wrolstad, R.E., T. Ngo, C.E. Finn, and Y. Zhao. 2008. Color quality of fresh and processed strawberries. ACS Symp. Ser. 983:18–42.