TABLE I.
The fermentation of d-tartaric and mucic acids by members of the Salmonella group as measured by pH changes.

Organism	Sodium d-tartarate		Sodium mucate	
	alkali	acid	alkali	acid
Sal. pullorum	+	—	+	—
Sal. gallinarum	—	+	—	+
Shig. jeffersonii	—	+	—	+
Sal. schotmülleri	+	—	—	+
Sal. aertrycke	—	+	—	+
Eberth. typhi	+	—	+	—

The data show that both sodium salts of d-tartaric and mucic acids differentiated between *Sal. pullorum* and *Sal. gallinarum.* Using these salts on a number of strains of both organisms over a period of 3 years, no variations or exceptions in the reactions listed above were obtained with either the tartrate or mucate media. Liquid and agar stab cultures gave the same reactions. The data on *Sal. aertrycke* and *Sal. schotmülleri* confirmed the work of Jordan and Harmon. The identical reactions obtained with *Sal. gallinarum* and *Shig. jeffersonii* add strength to the statement of St. Johns-Brooks and Rhodes[4] that these 2 organisms are identical.

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Evidence of Biologic Relationships Among Species of Chenopodiales.

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The differentiation of plants into species or larger groups is usually based upon gross or microscopic characteristics. Physiologic criteria are seldom emphasized and chemical ones are notoriously inadequate in the establishment of significant differences. The order *Chenopodiales* contains several genera which have been implicated in clinical allergy in man. The more important of these are *Amaranthus, Atriplex, Chenopodium* and *Salsola.* All, except the first, are included in the family *Chenopodiaceae.* There are many anatomic characteristics common to these genera although the gross appearances in the individual species differ enormously.

[4] St. Johns-Brooks, R., and Rhodes, M., *J. Bacteriol. and Path.*, 1923, **26**, 433.

Approximately 300 allergic patients (62 in the Santa Fe group), drawn from the area commonly designated as the Pacific Southwest, have been tested with the same extract of pollen from one or more species of each genus listed above. A significant number of these patients, especially those from the desert sections, gave skin reactions to these extracts. The total number of Chenopodiales-sensitive patients in each of the 3 groups is essentially the same. Those from the Santa Fe Clinic, however, represent 74% of the total patients in that series as compared with 57% and 38%, respectively in the 2 remaining groups. The higher incidence of sensitivity to this type of flora among Santa Fe patients may be due to greater exposure to these pollens.

The object of this study is not to draw sweeping conclusions but rather to point out interesting possibilities, based on skin reactions, in the hope that others may confirm or nullify these suggestions. *Amaranthus retroflexus* seems to be rather closely related to all the species studied. The fact that it reacted alone on but 4 patients of the 144 sensitive to *Chenopodiales*—in a total of 278 patients—seems to indicate a high degree of specificity of the extract. If reactions are obtained to it one should suspect sensitivities to other members of this order, although the absence of a reaction does not exclude other sensitivities. In the Santa Fe group but 22% of the patients, as compared to 51% and 47% in the other groups, failed to react to this pollen and did react to other members of the order. On the other hand 80% of the Santa Fe patients, as compared to 43% and 51% of the other groups, reacted to *A. retroflexus* and to one or more additional members; in fact, from 50% to 80% of these individuals reacted to all other genera.

The subdivisions of these totals, in most instances represent but few observations, yet they suggest that *Salsola kali* has little "anti-

TABLE I.—Skin reactions to species of the botanic order *Chenopodiales*.

	Total pts. sensitive to *Chenopodiales*	Reactions to *Amaranthus retroflexus* only	Patients *not* reacting to *Amaranthus retroflexus* but to the following—								Patients reacting to *Amaranthus retroflexus* and to the following—							
			Atriplex only	Chenopodium only	Salsola only	Atriplex and Chenopodium	Atriplex and Salsola	Chenopodium and Salsola	Atriplex, Chenop. and Salsola	Total patients	Atriplex only	Chenopodium only	Salsola only	Atriplex and Chenopodium	Atriplex and Salsola	Chenopodium and Salsola	Atriplex, Chenop. and Salsola	Total patients
Sante Fe	46	0	0	0	2	2	0	0	6	10	0	1	0	2	2	0	31	36
General Hospital	47	3	6	5	1	3	0	3	6	24	1	3	1	1	1	3	10	20
Private	51	1	2	5	4	7	1	2	3	24	2	1	0	6	3	1	13	26

genic" individuality. Sensitivity to it alone, or in combination with but one other genus seldom occurs. In the total of 58 patients who did not react to *A. retroflexus* 57% reacted to *S. kali.* In the group reacting to *A. retroflexus* 79% of the total reacted also to *S. kali.* It thus appears that the pollen of *S. kali* and *A. retroflexus* possesses one or more factors—possibly similar to group antigens among bacteria—common to the majority of the other species. In view of the fact that but 25 patients (less than 20%) of the total of 144, reacted to but one of the 3 genera—*Atriplex, Chenopodium* and *Salsola*—it is suggested that the pollen extract of each species contains many minor "antigenic" properties typical of the great majority of the other species, even though they be members of different genera. These findings apparently lend support to the botanic classifications and indicate a method for studying biologic relationships.

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Persistence of Accelerated Rate in Isolated Hearts of Thyrotoxic Rabbits: Response to Iodides, Thyroxine and Epinephrine.

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Acute experiments with thyroid products, either on the intact animal or upon isolated tissues, have been uniformly unsuccessful in reproducing the phenomena of hyperthyroidism. The advent of crystalline thyroxine has demonstrated that most of the non-specific results have been due to proteins and other impurities in the material used. In hyperthyroidism induced by thyroid feeding and in spontaneous hyperthyroidism in the human, tachycardia is one of the most characteristic features. It has been ascribed variously to mechanical causes, to nervous influences, to the overwork incident to a heightened metabolism, to toxic damage of the heart and to an increased production of epinephrine. Upon removal of the cause of hyperthyroidism or discontinuance of thyroid feeding the heart rate falls gradually, over a number of days, to normal. During the course of the experiments reported below it was found that the hearts and auricles of thyroid-treated animals, when isolated, continued to beat at a much faster rate than similar preparations ob-

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