I have been in California only six years—happy years—but these six years more than cover the period during which the fusion of the two university medical schools has been under consideration. During this period the universities have not lent themselves to so unworthy a purpose. The institutional relations have been friendly, indeed, and a spirit of cooperation has prevailed throughout. This is in keeping with the spirit of the west. The disregard for little things, the helping hand and feeling heart, are the legacy of pioneer days just passed. Besides, there really is very little occasion or basis for unseemly inter-university rivalry. Stanford set its limits regarding enrollment and is maintaining them, and with an attendance of 7,000 *our* state university surely is not lacking in numbers. Every year some of our medical students are advised to attend the California summer school, not only in the non-medical, but in the medical subjects as well. We accept each other's records without hesitation or question and also encourage students who desire to do so to go elsewhere. We have trusted each other and the rewards of this trust have, I believe, been ours. The spirit of reciprocity prevails. We Stanford men were not all "to the manner born" but we are citizens of California and as such have faithfully espoused the best interests of our state university. More than a score of us are alumni of California, whose faculty also contains a number of Stanford graduates. Besides, many members of the faculties of the neighboring universities have a common alma mater. Larger appropriations and opportunities for California neither alarm nor threaten us. If we have not decided to merge the medical, law or engineering schools or even our universities, that is no reason why our motives should be impugned. Moreover, to my knowledge the faculty of Stanford University has never even considered such a fusion and the University of California must in this matter speak for itself. The subject, to be sure, has been considered in the administrative boards and may, I presume, be considered again, for I believe that the same good will animates them.

It is strange, indeed, how Mr. Pritchett can call our universities "great" and our medical schools "strong" if the alleged spirit prevails, for that way, surely, only weakness lies. Mr. Pritchett's characterization of the field of modern medicine as "*so narrow*" is decidedly enlightening. Other statements in Mr. Pritchett's report call for comment but I shall forbear. The future will be Mr. Pritchett's and our sternest judge. I trust, however, that a sense of justice will cause Mr. Pritchett to give an explanation for his unqualified accusation, and since the great usefulness and influence of the foundation must in time be seriously jeopardized by such uncorrected errors, I further trust that the board of trustees of the foundation will disclaim responsibility for so serious and so unjust a reflection upon the good name of the two universities.

"Those principles of peace and conciliation which President Jordan has so eminently represented" are indeed being maintained between the two universities, and if I may reciprocate Mr. Pritchett's wish, I hope that the same principles of peace and conciliation which Mr. Carnegie has so long and so ardently espoused will more and more pervade the spirit and temper of the verdicts of the Foundation for the Advancement of Teaching.

A. W. MEYER

PALO ALTO, CALIFORNIA,
August 4, 1915

## SUCCESSFUL LONG-DISTANCE SHIPMENT OF CITRUS POLLEN

IN connection with investigations in Japan in the spring of 1915, Mr. Walter T. Swingle, physiologist in charge of crop physiology and breeding investigations, Bureau of Plant Industry, found it desirable to make an attempt to breed canker-resistant[1] strains of grapefruits and tangelos by hybridizing with the more resistant Japanese races of pumelo (Buntan) and other late-ripening, large-fruited citrous fruits commonly grown in Japan. He accordingly cabled for grapefruit and tangelo pollen.

[1] Hasse, Clara H., "*Pseudomonas citri*, the Cause of Citrus Canker," *Jour. Agric. Research*, Vol. 4, pp. 97–100, Pls. 9, 10, April, 1915.

Previous experiments had shown that it was possible to use pollen from flower buds which had been gathered when just ready to open and kept in cold storage until needed, but after five to seven days the buds discolored and moulded. Pollen had been sent in this way from Florida to California, but for a long period of time such as the duration of the voyage from Florida to Japan, it was necessary to develop other methods.

The attempt was first made to brush the pollen[2] from the anthers into small vials, but this process was abandoned for the much quicker method of putting the anthers entire into the vials. The preparation of the pollen may be divided into four methods, as follows: I., pollen in cork-stoppered vial; II., anthers in vial with cotton stopper; III., anthers in vacuum glass tubes, *i. e.*, tube filled with anthers for 1–2 inches, cotton ½ inch, then exhausted to about 10 mm. pressure and sealed; IV., anthers in dried vacuum glass tubes, *i. e.*, tube filled with anthers 1–2 inches, cotton ½ inch, exhausted to about .5 mm. pressure in the presence of sulfuric acid, the tube then sealed. As far as practicable the pollen was kept at a temperature of 10° C. until sealed.

Through the courtesy of Director Onda of the Imperial Horticultural Experiment Station at Okitsu, Shidzuoka Ken, Mr. Swingle made arrangements to test the viability of the pollen as well as to make hybrids in the variety collection of citrous fruits. Professor Y. Kumagai, of this station, kindly agreed to test the viability of this pollen in 30 per cent. cane sugar solution. His careful observations show conclusively that pollen can be successfully shipped from Florida to Japan and be in viable condition on arrival, four to six weeks after it is gathered.

Grapefruit pollen collected April 6, from one sealed tube (method III.) which was opened May 17, 1915, showed within forty-eight hours a germination of 50 per cent. with the pollen tubes fifteen times the diameter of the pollen grain. Fresh Joppa orange pollen used as a check showed the same germination (50 per cent.) within twenty-four hours, with pollen tubes twenty times the diameter of the pollen grains. Fresh "Ogasawara grapefruit" used as a check showed 80 per cent. germination inside of twenty-four hours, with the pollen tubes twenty times the diameter of the pollen grains. Pollen of Valencia Late oranges used as a check showed a germination of only 20 per cent. within forty-eight hours, and a length of pollen tube of but three to four times the diameter of the pollen grain. Other tubes of grapefruit and tangelo pollen prepared in the same manner (*i. e.*, method III.) showed from 2 to 10 per cent. germination, both with pollen tubes from two to five times the diameter of the pollen grain, while still others gave no results whatever. From observations upon these different lots of pollen it is probable that this may have been due to the pollen having low vitality when gathered. It is obvious, also, that there may be a variation in the viability of pollen of different varieties, or even in pollen from individual flowers.

Grapefruit pollen sent by methods I. and II. showed 7–8 per cent. germination within forty-eight hours, and pollen tubes ten times the diameter of the grain.

Pollen prepared by method IV. was sent late in April, so that no report has as yet been received showing the percentage of germination. However, in a cablegram sent from Tokyo July 8, 1915, Mr. Swingle reports: "Dry pollen successful," indicating that the most promising method for shipment of pollen over long distances is the one last noted, of drying in vacuo over sulfuric acid.

The necessity for stricter quarantine regulations to exclude dangerous diseases and insect pests already operates to prevent the free shipment of many plants from one country to another. As such regulations become more strict, the difficulties of securing plants increase. It is likely, however, that in most cases pollen shipped in vacuum tubes could be

[2] The sources of pollen were Bowen grapefruit and tangelo twigs bearing flowers fully matured but not yet open, gathered at Eustis and San Mateo, Florida. The lower part of each bundle of stems was packed in moist sphagnum, the bundle then wrapped in oiled paper and mailed from Florida to Washington in ordinary mailing cartons.

sent without danger of carrying plant diseases or insect pests.

MAUDE KELLERMAN
BUREAU OF PLANT INDUSTRY

## VALLEY-FILL OF ARID INTERMONT PLAINS

UNFAILING tendency too broadly to generalize from a new-found principle is nowhere better shown than in the instance of ascribed origin of the wide intermont plains of the Great Basin in particular and in general of all desert tracts of the globe. So graphic are the descriptions of Basin Range features given by the various members of the famous Fortieth Parallel Survey that even after the elapse of half a century they continue to hold first place with scarcely a question concerning the accuracy of their genetic foundation.

One statement of the late Professor I. C. Russell furnishes the keynote to the whole problem. He speaks of the mountains of Nevada being "buried up to their shoulders in the débris of their own substances." As a corollary he ascribes enormous depths of 2,000 to 3,000 feet to the valley-fill between the various basin ranges. Russell's observations, as well as those of others, are mainly impressions gained on hurried reconnaissances through the region; and the statements made at the time really had little to substantiate them. The conceptions which they represent are in the extreme brilliant and suggestive. For this very reason it is that they go so long unchallenged.

Singularly enough one of Russell's most typical examples of buried mountains, and one oftenest cited as around which the valley-fill is thickest, is a district wherein subsequent investigation conclusively shows the valleys or intermont plains to have rock-floors. In these valleys the strata of the bed-rock are flexed and tilted often to a vertical attitude. The planed surface coincides nearly with the present ground surface. The wash or valley-fill is almost nil. To be sure there may be some instances in which there is a valley filling that has greater or less depth; but in many cases the broad intermont basin has a very pronounced rock-floor and the thickness of regolith or soil mantle is inappreciable.

Other critical data now exist that bear directly upon the extent of the valley-filling. The larger number of deep drill-holes, which have been put down in the desert regions of the west during recent years, furnish some very conclusive evidence touching the points under consideration. Of course well-logs, as a rule, are notoriously fanciful and, without proper checks, can not be implicitly relied upon. Yet many such records are adduced as proving the great depth of valley-fillings.

In a number of cases, which are really test-cases, depths of 2,000 to 3,000 feet are reported as being entirely in wash material. These statements are even presented in scientific literature. In one instance, in which soft Eocene clays and sands were dipping at an angle of 70 degrees, the drill is reported as having penetrated nearly 2,500 feet of wash débris without passing through it. In another case, that of the Santa Cruz Valley, near Tucson, Arizona, the valley-fill was said to be over 2,000 feet thick as shown by the drill; yet the late W J McGee found bed-rock near-by covered only by a few inches of soil.

One of the latest cases of this kind is the interpretation of deep-drill records in the Hueco (Tularosa) bolson in southern New Mexico. Drill-logs of more than 2,000 feet are given as evidence in support of the contention of the great depth of valley-fill. As a matter of fact, and as the records themselves clearly indicate, the beds passed through by the drill are the very red-beds that overlie the Carboniferous limestones of the region, and that one would expect first to encounter a short distance beneath the surface of the desert at those points. Abundant other data from this locality point rather conclusively to the fact that this so-called valley-fill is mainly not wash débris at all but typical soft red-beds. This seems to be another instance of forcing facts to fit theory.

What is still greatly needed in these desert investigations is further critical evidence bearing upon the geological date of the formation of the so-called Basin Range structures.