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ABSTRACTS

The author's reviews of technical papers reported in other publications on biology and agriculture during the course of 1955–1956.

1: HASHIMOTO, Yoshiyuki & EGUCHI, Yasunobu : **Histological observations on the gonads in the cattle and the horse fetus, I. The cattle fetus.** *In* Japan. Journ. Zootech. Sci. 26 (4) 259–265. 1955. The gonads of 9 male and 9 female fetuses of the cattle were used in this study. The fetuses are 5.7 to 45.0 cm in "crown-rump length" in males and 16.3 to 38.0 cm in females. The following observations were made.

Testis : There is a cuboidal layer of germ epithelium in the testis of a 5.7-cm-long fetus. It becomes flattened gradually with age. With the vascularization in the *tunica albuginea*, there is a remarkable increase of connective tissue fibers in the vascularized areas. The seminiferous tubules are distinctly limited by a *membrana propria*, exterior to which is a thin layer of small connective tissue cells forming a capsular investment. The tubules consist of two kinds of cells, i.e., indifferent cells and germ cells. The former is numerous and the latter a few. Both cells in the tubules have a tendency to increase in number, the numerical ratio between them being scarcely altered in all testes used. Interstitial cells are found sparsely at first and then form cluster-like masses with gradual vascularization.

Ovary : In 16.3-cm to 18.5-cm-long fetuses, the sex cords having a broad band-like appearance contain many small indifferent cells and a few germ cells. Primary follicles increase gradually in the inner part of the cortex. In the ovaries of 25-cm- and 27-cm-long fetuses, the sex cords manifested a degenerated appearance. Meanwhile, in a fetus grown 30.0-cm-long, the remarkable change is noticed with the increase in replenished sex cords. Therefore, it is presumed that the sex cords have newly been formed descending from the germ layer, or reconstructed from the parenchymal tissues in these growing stages. No interstitial cells have been found in any ovaries used.

The origin of the interstitial cells in the testis and of the medullary cords in the ovary is also discussed briefly.

2: HASHIMOTO, Yoshiyuki & EGUCHI, Yasunobu : Ditto, **II. The horse fetus.** *Ibid.* 267–272, 1955. The gonads of 4 male and 5 female horse fetuses were studied histologically. The results obtained are summarized as follows:

(**1**) The gonads of the horse fetus are by far larger than those of the cattle fetus. (**2**) In the outer surface of the testis is found the *tunica albuginea* which is devoid of cell cords and shows a well marked connective tissue membrane. In its inner broad area, there are a lot of interstitial cells among which young seminiferous tubules are sparsely scattered, (**3**) In the ovary, a dense fibrous membrane becomes clear at the periphery and the cords are seen in it except near the *hilus ovarii*. The inner broad portion of the ovary is composed of many interstitial cells with the supporting tissue. (**4**) The enlargement of the fetal gonads may be due, for the most part, to the result of an increase in number and size of the interstitial cells. (**5**) The interstitial cells are divided into small groups by connective tissue cells and fine fibers intervene between the interstitial cells. (**6**) The interstitial cells are large and polyangular, containing the alveolar nuclei in the granular cytoplasm. (**7**) There are sometimes transitional types between the interstitial cells and the connective tissue cells. (**8**) The seminiferous tubules are composed of many small indifferent cells and a few round germ cells. (**9**) The sex cords in the ovaries have the same cell-components as in testes. But the structures and the cells of them are variable with the stages tested.

3: HEMMI, Takeo, **Notes on new or noteworthy plant diseases in Japan, I.** *In* Jubilee Public. in Commen. of Sixtieth Birthdays of Prof. TOCHINAI & Prof. FUKUSHI, 1–5, 1955. An anthracnose of dahlia caused by a new species of *Gloeosporium* was first described in this paper. The disease appears upon the green surface of stems as light brown or grayish brown spots in summer. These spots or diseased areas are distinct in outline, and rapidly enlarge in the direction of the long

axis. The close examination of which reveals small dark colored fruiting pustules of the causal fungus which break out scatteringly over its entire surface. In this paper its diagnosis was given under the name of *Gloeosporium* (*Colletotrichum*) *dahliae* HEMMI.

Die-back or stem anthracnose of cowpea caused by *Colletotrichum truncatum* (SCHW.) ANDRUS et MOORE and cabbage yellow caused by *Fusarium oxysporum* f. *conglutinans* (WR.) SNYD. et HANS. were also reported in this paper.

4: IMAZU, Tadashi & FUJISHITA, Moriyuki : **Cucumbers.** *In* Land & Crops of Nepal Himalaya (ed. by H. KIHARA) Kyoto, Japan, 213–228, 1955. Cytogenetical, morphological, and ecological studies were made on the Nepalese cucumber, wild and domesticated, brought by the Japanese expedition to Nepal Himalaya in 1952. The meiosis in the F_1 plants of the Japanese varieties crossed with the wild cucumber is regular and the seven bivalent chromosomes are formed regularly at the metaphase of the first division. These results suggest that a homologous genome exists in both the wild cucumber and the Japanese varieties. The size and the shape of the wild cucumber fruits are just like the hen's egg, and the taste of them is bitter (dominant character) and even unpalatable. No useful character was found in the Nepalese cucumbers, and in its hybrid between Japanese varieties. In the Nepalese cucumbers, the resistance to the various disease was low, as compared with Japanese varieties when cultivated in Japan. The experiment on the photoperiodic responses indicated that the female flower formations of Nepalese cucumbers on main or lateral branches were inhibited markedly under the long day condition.

5: ITOI, Setsumi : **Mycerial growth of *Cochliobolus Myabeanus* on nutrient media containing small amount of fungicide.** *In* Forsch. a. d. Gebiet d. Pflanzenkrankheiten. Kyoto, 5 (2) 75–76, 1955. The result of the writer's experiment on the effect of Uspuln and Ôdo, a kind of copper fungicides, upon the mycelial growth of *Cochliobolus Miyabeanus*, the causal fungus of "Helminthosporium Blight" of the rice plant was reported. The addition of 0.00125 per cent Ôdo accelerated the growth of the mycelium, but not the same per cent of Uspuln definitely. More than 0.00167 per cent addition of Uspuln or 0.002 per cent Ôdo presented about fifty per cent inhibition of the mycelial growth.

6: ITOI, Setsumi : **Studies on the nutrition of *Stagnospora carpathica* BAEUM.** *In* Ann. Phytopath. Soc. Japan, 19 (3/4) 120–124, 1955. In this paper it has been shown clearly that thiamine is recognized to be the indispensable growth factor for *Stagonospora carpathica*, the causal fungus of the brown spot of broad bean. The writer has reported also the results of experimental studies on the effect of the nitrogen as well as the carbon sources for the same fungus.

7: IWASA, Yosaburo, INOUE, Masao., KAJIMOTO, Goro., HASHIMOTO, Akira and MUKAI, Katsunori: **Studies on the color substance of oils. (1) On the rape oil (1).** *In* Journ. Agric. Chem. Soc. Japan, 29 (11) 844–846, 1955. Activated fuller's earth adsorbed the pigment of rape oil well and the adsorbed pigment was extracted with 3% Sodium hydroxide. The pigment was precipitated the extracted alkali solution being acidulated to pH 4.3 with HCl. The purified pigment contained 0.17 g % N and showed a biuret reaction, but did not give a ninhydrin reaction.

8: KANESEKI, Shiro : **Evaluation of evapo-transpiration from a paddy field.** *In* Jour. Agric. Meteorol. 12 (1) 30–32, 1956. (1) The evaluation of evapo-transpiration was taken over a paddy field in order to examine closely the utility of the Thornthwaite's method based on aerodynamic considerations which lead to the equation

$$E=\frac{\rho k^2(q_1-q_2)(u_2-u_1)}{\left(ln\frac{z_2-d}{z_1-d}\right)^2}$$

in which E, ρ and k are the rate of evapo-transpiration, the air density and von Kármán's constant respectively, u_1, u_2, q_1 and q_2 are the wind speeds and specific humidities at the heights z_1 and z_2, and d the so-called surface zero displacement. (2) The values of the specific humidity and total run of wind were obtained with the aid of the relatively simple apparatus, that is, thermocouple psychrometer and Robinson type anemometer. (3) Hourly values of the rate of evapo-transpiration were evaluated from the above mentioned equation by taking the zero-plane displacement d=47 cm

for the reasonable value from the observations and compared with the values of the direct measurement used the trial manufactured apparatus. (4) The present experiment suggests that the practical application of the Thornthwaite's method will be possible to evaluate the evapo-transpiration from the natural surfaces by improving the method of observation.

9: MATSUOKA, Michio : **Buckwheat.** *In* Land & Crops of Nepal Himalaya, 125–134, 1955. About 100 samples of wild and cultivated buckwheat were collected from Central Nepal by the Japanese Himalayan Expeditions to Nepal, 1952–1953. These buckwheat included *Fagopyrum esculentum, F. tataricum* and *F. cymosum.* The first two are cultivated and the other is wild in Central Nepal. The author concludes that *F. tataricum* was brought to Nepal by Tibetan. In *F. esculentum* and *F. tataricum,* there are no differences according to the elevation and other geographical condition.

10: MATSUOKA. Michio : **Hemp.** *Ibid.* 135–139. Four races of wild hemp were collected from Central Nepal by the Japnese Himalayan Expeditions to Nepal, 1952–1953. Their various characteristics were observed in addition to those observed by N. I. VAVILOV (1926).

11: NAKAMURA, Kenzi & KITADA Jin'ichi : **Chromosomes of some Orthopteroid insects, with special reference to sex-chromosomes.** *In* Cytologia 20 (2) 119–132, 1955. Spermatogonial chromosomes of *Grylloblatta sp.* are found to be 30 in number, including an XY pair of sex-chromosomes. In *Oecanthus indicus* and in an unidentified species of the same genus the chromosomes are 19 in the male and 20 in the female. Accordingly, the condition of the sex-chromosomes is XO–XX, as usually found in the Orthopteroid insects. The primitive condition of the sex-chromosomes in the *Oecanthus* group is assumed to be of XO–XX type, X being acrocentric. The evolutional process of these different types of sex-chromosomes in this group may be explained as follows: if breakage happened to occur in an X and translocation of its distal part to the centric end of the other had taken place in the female, metacentric neo-X and an acrocentric neo-Y would have been formed. The XO–XX condition of *nigricornis* may be of the metacentric neo-X, while the XY pair of *longicauda* would be consisted of an acrocentric original X and a neo-Y. The XO–XX condition of *indicus*-type, of which X being acrocentric, would have been brought about from XY–XX of *longicauda*-type by gradual diminution to complete disappearance of Y. The relation between acrocentric and metacentric types of the XO–XX condition which are reported in closely related species of Orthopteroid insects would be interpreted in the same way.

12: NAKAO, Sasuke : **Agricultural practice.** *In* Land & Crops of Nepal Himalaya, 95–107, 1955. The indigenous methods of agricultural practice in Nepal are described. They are illustrated in 29 plates of 58 photographs.

13: NAKAO, Sasuke : **Agricultural improvement.** *Ibid.* 109–113. From the technical point of view, the methods for the promoting the productions of agricultural harvests in Nepal are described. For the guide of farmers the plant indicators are especially necessary and effective in Nepal and the example of it is proposed.

14: NAKAO, Sasuke : **Chilli.** *Ibid.* 191–192. The Chilli (*Capsicum annuum*) from Nepal is studied. It is classified as one belonging to Cayenne group, and is compared with the similar varieties in Japan.

15: NAKAO, Sasuke : **Barley.** *Ibid.* 313–343. A collection of barley seeds of Nepal was studied. 3660 plants were raised in Japan and classified into 35 varieties, in which 12 varieties are new. Their latin diagnosis are given. The fertile *intermedium* barley is found popular in Nepal. There are three groups of barley in relation to the geographical distribution in Nepal, i.e., Indian, Himalayan and Tibetan barley groups.

16: NAKAO, Sasuke : **Wheat.** *Ibid.* 345–353. The writer examined the wheat collections brought from Nepal by the Japanese Himalayan Expeditions to Nepal 1952–1953. They are classified into 17 races and 19 botanical varieties. They can be grouped into the Indian type and Tibetan type. The wheat flora of Nepal Himalaya is very influential to that of south-western China.

17: NAKAO, Sasuke and MORI, Shigeki : **Oats.** *Ibid.* 355–361. The weed oats and cultivated oats in Nepal were studied. It is found that *Avena strigosa*, or tetraploid oats, are popular as weed in wheat and barley fields in Nepal. The hexaploid *Avena fatua* ssp. *septentrionalis*, and ssp. *fatua* are found wild, whereas another hexaploid *Avena sterilis* was found clutivated.

18: NAKAO, Sasuke and SAUER, Jonathan : **Grain Amaranths.** *Ibid.* 141–146. Seeds of grain amaranths were brought back from Nepal by the Japanese Himalayan Expeditions to Nepal, 1952–1953. They are cultivated in America and their dried specimens were deposited in many American Herbaria. The species found in Nepal are *Amaranthus leucocarpus* and *A. caudatus*, and are used as food grains. Their vernacular names and distributions are investigated.

19: NAKAO, Sasuke and YABUNO, Tomosaburo : ***Hordeum brevisubulatum* LINK.** *Ibid.* 363–364. The senior author found the half decayed ears of *H. brevisubulatum* around the base camp at Annapurna IV near Manangbhot, alt. 3500 m, on the 5th of Oct. 1952. The seeds were sown in Japan and two seedlings emerged. In PMC's seven normal bivalents were observed, hence *H. brevisubulatum* from Himalaya, is a diploid species. *H. secalinum* SCHREB. is tetraploid species (KUCKUCK, 1934). These two species belong to the section STENOSTACHYS NEVSKI and are closely related with each other. *H. secalinum* is distributed mainly in Europe and the western parts of the Euro-Asiatic continents, while *H. brevisubulatum* is distributed mainly in the eastern parts of the continent.

20: NAKAO, Sasuke and YAMASHITA, Kosuke : **Variation in some plant populations.** *In* Shūdan Idengaku (Population genetics) 245–259; ed. by T. KOMAI, Tokyo, 1956. From the viewpoint of ecological approach to population genetics, the variation in some characters in natural populations of *Camellia japonica* var. *spontanea* occurring near Asizurimisaki in Kôti Prefecture, of *Hemerocallis* growing near Takayama, in Gifu Prefecture and of *Veronica persica* found in Hiroshima, were studied. (**1**) In the case of sub-spontaneous populations of *Camellia japonica* var. *spontanea* occurring near Asizurimisaki, variation was found in respect to the leaf angle, leaf size, flower color, style length, color of the base of filaments and in the pollen fertility. Among the 62 individuals examined, 25 bore pink filaments and 37 white ones. Long-styled plants (with the style longer than the filaments) numbered 14, medium-styled plants (with the style as long as the filaments) 34, and short-styled plants (with the style shorter than the filaments) 14. Partial pollen sterility was found in 7 plants among 66 individuals examined. (**2**) A hybrid population of *Hemerocallis* was found in a valley near Takayama. This consisted of clones of plants of intermediate types between *H. fulva* and *H. citrina*. The hybrid index was scored on 2193 clones, the intermediate types predominating, which resembled *H. fulva* more than *H. citrina*. Such a hybrid population apparently represents an initial stage of introgression of genes of *H. citrina* into the population of *H. fulva*. (**3**) *Veronica persica* growing in the bombed area of Hiroshima was statistically studied in 1950, 1951 and 1952. Flowers with supernumerary lobes (mostly 5) were rather common, while normal flowers are 4-lobed. The frequency of such polylobed flowers varied according to the distance from the atomic bomb hypocenter. The central zone (within the radius of 200 m from the hypocenter) give the highest value every year. The percentage of colonies bearing polylobed flowers was higher in the central zone than in the peripheral zone. The percentage in the former zone was 52 in 1950, 50 in 1951 and 42 in 1952.

21: OGATA, Kuniyasu : **Studies on the storage of onions. (6). The effect of humidity on the dormancy and keeping quality of the onions.** *In* Agric. & Hort. 31 (1) 93–94, 1956. Keeping quality of onions in storage at 15°, 30° and 20°–30°C was intensified under the condition of 40–50% of relative humidity, while the respiratory intensity and tetrazolium reaction of onion bulbs were decreased in the given humidity.

22: OGATA, Kuniyasu and INOUE, Takashi : **Studies on the storage of perishable agricultural products. (6). The variation of the ascorbic acid content during the storage in certain vegetables harvested at different stages of maturity.** *In* Studies from Inst. Hort. Kyoto Univ. 8, 1956. The ascorbic acid contents of vegetables (11 varieties representing 9 species) were studied during the storage period after the edible parts were harvested at different stages of maturity from

the salable basis. The results are grouped as follows: (1) The ascorbic acid contents are different according to the degree of maturity at the harvest time and its decrease during the storage is dissimilar according to the initial contents at the time of harvest: The onion, green pepper and pak-choi come under this category. (2) The initial content at harvest time is as above, but the decreasing tendency is just the same without regards the initial contents: The sweet poteto, egg plant, cucumber and spinach come under this category. (3) The initial content at different stages of maturity is quite similar and the decrease during the storage is also entirely similar: The tomato and potato represent this type.

23: OGATA, Kuniyasu, INOUE, Takashi and MIZUKATA, Akira : **Studies in the physiological mechanism of Maleic Hydrazide to the subterranean crops and seeds. (1) The effect of M. H. on the ascorbic acid and carbohydrate amount in the potato.** *In* Journ. Hort. Assoc. Japan, 25 (3) 1956. In potatoes, it was found that a gradual decrease of reducing suger content and a gradual increase of starch at the last stage of tuber development. This tendency was found more conspicuous in the potatoes when they were treated with M. H. The ascorbic acid content in untreated leaves was rather rapidly decreasing in approaching to the harvest, but in the treated plot it was considerably higher during a certain period, then decreased more rapidly to reach to an extent of untreated leaves at the harvest time. The M. H. treated tubers contained a little higher amount of the ascorbic acid than tubers of untreated plot. In the tubers of untreated plot, the reducing suger was observed to decrease after the tubers commence sprouting, but it was remarkably accumulated in the treated potatoes. The decrease of the starch and total carbohydrate contents in the tubers were lower in the treated potatoes throughout the storage period. Although M. H. treatment destroys the apical dominancy and inhibits the elongation of sprout, the period of dormancy was not prolonged in our experiment. Masses of stolon-like proliferations of buds were formed in such tubers, not producing normal sprouts.

24: OGATA, Kuniyasu, INOUE, Takashi and MURATA, Takuo : Ditto, (2) **The effect of M. H. on the metabolic pathway in onion bulbs and potato tubers.** *Ibid.* 25 (4) 1956. The effect of M. H. on the respiration of onion bulbs and potato tubers was studied at the end of 5 months after harvest. The leaves of onion sprayed with 0.25% solution of M. H. two weeks before the harvest, and the potato plants were similary treated with 0.1, 0.2, 0.3 and 0.5% solution of M. H. three weeks before the harvest. It seems appropriate to conclude that the growth inhibition and the physiological disorder of onion bulbs and potato tubers received M. H. treatment must have been induced from the disturbance of the respiratory mechanism and/or the alteration of metabolic pathway.

25: OMATA, Shôjiro, UENO, Teruo and NAKAGAWA, Yasushi : **On the pigment and their formation in Amino acid condiment.** *In* Journ. Ferment. Technol. 34 (3) 166–172, 1956. Pigment components of amino acid condiment were isolated by the paper column chromatography and the color formation from the mixture of sugar and amino acid in the presence of 19% HCl was studied spectroscopically. The following results were obtained : (1) Three components of pigment (F_1, F_2, F_3) were separated by the column chromatography and two of them (F_1, F_3) were found to be principal. The pigment of amino acid condiment resembles that of Kiagé soy-sauce. (2) The F_2-pigment occurred in the amino acid condiment, which was produced under high-temperature. It is produced by the reaction on sugar-fission product with amino acid, and unstable in the presence of air. (3) Furfural and H. M. F., produced by the decomposition of hexose and pentose, played an important role in the pigment formation from the mixture of sugar and amino acid in the presence of 19% HCl. Especially, H. M. F. acted in a characteristic manner.

26: OMATA, Shôjiro, UENO, Teruo and NAKAGAWA, Yasushi : **On the discoloration of Mirin. (2). On the Carbonyl compounds and the mechanism of their formation.** *In* Journ. Ferment. Technol. 34 (4) 173–178, 1956. Carbonyl compounds in mirin and those produced during its storage were separated as 2, 4-DNPHs by column chromatography. They were measured spectroscopically, and the mechanism of their formation was studied. The following results were obtained: (1) Many saturated and a few unsaturated carbonyl compounds were separated. Known compounds

of them were acetaldehyde, crotonaldehyde, diacetyl, acetoin and hydroxymethylfurfural. Keto acid was not found. (2) Four carbonyl compounds produced during storage for 3 months were separated, but their structure was not determined. The number and amount of the carbonyl compounds were affected by the condition of storage. (3) As the mechanism of carbonyl compounds formation during storage, the Strecker degradation was suggested, namely,

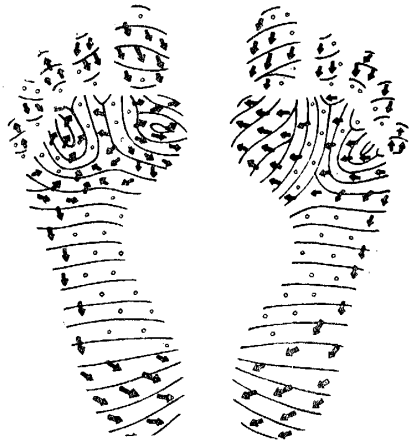
$$\text{Alanine}+\text{Diacetyl}=\text{Acetaldehyde}+CO_2+\text{Amino-keto-compd.}$$

$$CH_3\cdot CH\cdot NH_2\cdot COOH+CH_3\cdot CO\cdot CO\cdot CH_3=CH_3\cdot CHO+CO_2+CH_3\cdot CH\cdot NH_2\cdot CO\cdot CH_3$$

Many unknown carbonyl compounds were produced by the Strecker degradation during storage.

27: TAGAWA, Masayuki : **The inclination and orientation of sweat ducts in the sole epidermis.** *In* Acta Anatom. Nippon. 31 (5) 483–488, 1956. The axis of the spiral, in which from the sweat duct traverses the corneum to reach the sweat pore, is inclined toward the skin surface with an acute angle in most parts of the sole epidermis. Hence, it shows a definite orientation when viewed by appropriate means from the surface of the skin. The essential study was performed using the feet of four men and one woman as the materials. Observations were made with a magnifying lens on the sole skin, which was at rest, cleared of cell debris and painted with xylol. The soles of two female infants and a young female pig-tailed macaque served for purposes of comparison.

In the toe-pads, most of the sweat ducts start antero-laterally and end postero-medially. In the fore part of the sole, the sweat ducts show in their orientation a dominant tendency to run from the lateral to the medial side of the foot. In the lateral region of the arch of foot, the ducts are unexceptionally directed posteriorly. In the heel also, they usually run posteriorly. In these two regions, the ducts form a smaller angle with the skin surface than in the other regions. In the arch, the ducts are nearly perpendicular to the skin surface. In the infants, the sweat ducts are oblique to the skin surface only in the antero-medial part of the sole and in the heel and are orientated similarly as in the adults. In the pig-tailed macaque too, the orientation pattern of sweat ducts is roughly similar to that of man. Except for some details, the general pattern of orientation is similar in the two soles of an individual and the bilateral symmetry is manifest.



Right Sole Left Sole

Fig. The arrows indicate the orientation of the sweat ducts at the respective sites and small white circles show those sites where the sweat ducts are perpendicular to the skin surface.

28: TAKAGI, Shunzo and TAGAWA, Masayuki : **A note on the shape and size of the human eccrine sweat pore.** *In* Japan. Journ. Physiol. 6 (1) 47–49, 1956. The sweat pore is a rounded concavity or "beaker", about 30–50 micra deep and lined by squamous keratinized cells, into the base of which empties a sweat duct. The aperture of beaker is approximately 70 micra in diameter and the opening of sweat duct at its base is about 16 micra in diameter.

29: TAKAHASHI, Minoru : **Influence of temperature and light upon the production of sexual organs of Pythiaceous fungi.** *In* Forsch. a. d. Gebiet d. Pflanzenkrankh., Kyoto, 5 (2) 83–84, 1955. The ratio in production of the sexual and asexual reproductive organs of several species of *Pythium* was considered to be nonvariable by the kind of light, but influenced considerably by temperatures. The lower temperatures than 24°C accelerated the oospore-production and the higher temperatures than 28°C the conidial production.

30: TAKAHASHI, Ryoichi : **Some species of Aleyroididae from Madagascar (3) (Homoptera).** *In* Mem. de l'Inst. Sci. de Madagascar, Paris, Sér. E, 6 : 375–441, 42 figs., 1955. In this third report on the Aleyrodidae found in Madagascar 41 species are discussed of which 37 are described as new to science, and a new genus, *Pogonaleyrodes*, is proposed for *P. fastuosa* n. sp. Redescriptions are also given for 2 little-known species.

31: TANAKA, Tyôzaburô : **On blueberries.** *In* Agric. Community 9 (4) 31–34, 1955. Importance of small fruit culture, origin of blueberry culture, classification of blueberries, method of growing highbush blueberries, their varieties, yield, pests, &c. are discussed.

32: TANAKA, Tyôzaburô : **Five most important nut fruits requiring concentrated attention.** *Ibid.* 9 (10) 24–30, 1955. Calling attention of scientific knowledge of stereo-culture with reference to nut-fruit growing, the author emphasizes the significance of concentrating efforts on planning to establish solid cultures of pecans, walnuts, filberts, almonds and macadamia nuts within the Japanese territories from the standpoint of logical land use and the increase of staple food from woodlands so far semi-neglected and subject to soil erosion.

33: TANAKA, Tyôzaburô : **Best Navel oranges of southern California.** *In* Hort. Iyo Route 10 (4) 6–9, 1955. Three Californian Washington Navel strains and derivatives are compared. Without reference to the productivity, Carter ranks the first from quality standpoint, while Robertson and and Trovita will follow.

34: TANAKA, Tyôzaburô : **Past 25 years of Japan's horticulture.** *In* Agriculture (Journ. Agric. Soc. Japan), (868) 35–45, 1955. The progress of Japan's horticulture during past 25 years is briefly outlined.

35: TANAKA, Tyôzaburô : **Almond facts.** *In* Agric. Comm. 10 (6) 18–21, 1956. Historical accounts, cultural requirements, recommended varieties, food value, use and profit, future prospect of domestic production, &c., are discussed.

36: TANAKA, Tyôzaburô : **Almond industry of California.** *Ibid.* 10 (10) 20–24, 1956. An outlock of the almond culture in California is delineated with comment of necessary knowledge and spirit required to operate the industry and useful to start its culture in our territories.

37: TANAKA, Tyôzaburô : **Theories pertaining to fruit formation, developed in America : A review.** *In* Central Horticul. (603) 5–11, 1956. A critical summary of theories presented so far from the United States to solve the problems reflecting the physiology of fruit-bud initiation, anthesis, pollination and fecundation, embryo formation, fruit setting and development, and the prevention of fruit drop.

38: TANAKA, Tyôzaburô : **Will lemon culture industriarize in Japan?** *In* Tachibana 17 (8) 9–13, 1956. Japan is not sufficiently prepared to initiate a lemon industry under the competition of California lemons. This is primarily due to the lack of education in the part of consumers and growers' unpreparedness to the steps of air-conditioned storage, curing and timely marketing, to ensure the profit covering the handicap of inadequate growing conditions.

39: TANAKA, Tyôzaburô : **Nut culture.** *In* Fumin (Prosp. Farmers) 28 (12) 60–64, 1956. Experimental success of filbert culture in Japan based upon Tanaka No. 1 (Barcerona) and No. 2 (a Russian variety) in mixed planting, is reported in detail.

40: YABUKI, Kazutoshi and SUZUKI, Seitaro : **The air-flow crossing over the mountain range.** *In* Geophysic. Magaz. 27 (2) 273–291, 1956. The down air-flow from the crest of the mountain range to lee becomes intensified if the mountain profile is represented by $Z=\frac{h}{1+\frac{x^2}{a^2}}$, with condition $a \approx 2h \sim h$ and if the contour-lines run as straight and parallel as possible. It is also most essential that the stable and at least doubly stratified atmosphere exists with a thermal inversion as at nearly high altitude as the mountain range. These conclusions are based on the aerological observations as well as on the laboratory experiments. So it is natural that with the advent of a warm prefrontal (or cold postfrontal), the down-air flow should break out in those districts.

41: YABUKI, Kazuoshi and SUZUKI, Seitaro : **The experimental Investigation on the air-flow cros sing over the mountain.** *In* Tenki (Weather) 3 (6) 7–12, 1956.

42: YABUNO, Tomosaburo : ***Echinochloa***. *In* Land & Crops of Nepal Himalaya, 255–259, 1955. Genus *Echinochloa* from Nepal contains 4X and 6X species. Some hybrids between strains of 6X species from Nepal, and a hybrid between Japanese and Nepalese 6X species were obtained in 1954 and 1955. From cytological observations, it is assumed that in Nepalese 6X species one genome of strain No. 289 is not homologus to one of No. 508. In the 1st metaphase in PMC's of the hybrid between No. 508 and *E. Crus-galli* var. *caudata* of Japanese 6X species 27_{II} were observed, but many anthers did not open and pollen fertility was 48.6%.

43: YOSHIDA, Shizuo : **Photoperiodic responses of hemp plants, especially on their morphogenetic changes in leaf shape.** *In* Proc. Crop. Sci. Soc. Japan, 24 (3) 213–216, 1956. The hastening of flowering and the inhibition of stem growth were proportionate to the strength of photoperiodic induction due to the initial exposure to short-day, and the reversal of growth to vegetative phase under the long-day condition was proportionate to the weakness of photoperiodic induction. It was worth notice especially that in leaves except the juvenile ones the number of leaflets decreased under the influence of short-day and increased under the influence of long-day. These marked systematic changes in leaf shape under the influence of day-length correspond to the vegetative or reproductive growth behavior under the influence of day-length. As to the decrease of the number of leaflets under the influence of short-day, male plants were more sensitive than female plants.

44: WATANABE, Takehiko and MATSUMOTO, Sachio : **On the colloidal properties of bentonite. (7) Rate process of thixotropic gelation.** *In* Journ. Chem. Soc. Japan, Pure Chem. Sect. 76 (11) 1215–1220, 1955. The increases of yield value A of the bentonite or other clay suspensions with time after stirring, were measured. The above process is divided into two first-order processes. The limiting value of the initial first-order process $A_{1\infty}$, and that for the second first-order process $A_{2\infty}$, follow the equation, $A_{1\infty}=b_1C_v^4$ and $A_{2\infty}=b_2C_v^2$, where C_v is the clay concentration (vol. %) and b_1, b_2 are constants respectively. The initial first-order process probably consists in the formation of the non-ordered gel structuie of particles. The ensuing first-order process may be the re-orientation of the gel structure from the former structure.