système se réduit à une seule molécule, nous n'avons que 2 coordonnées, et l'espace figuratif de Gibbs a une réalité concrète, c'est un plan. Pour 2 molécules, nous avons 4 coordonnées, et l'espace figuratif devient un être mathématique, comme on dit, un «hyperespace» quadridimensionnel. Dans le cas de n particules l'espace a 2n dimensions. La représentation de Gibbs est commode parce qu'elle simplifie le langage. En effet, tous les états possibles du système sont représentés par des points de l'hyperespace. L'évolution du système, au lieu d'être indiquée par des variations de nombres, est représentée par le déplacement d'un point qui décrit une ligne dans un espace 2n-dimensionnel. On l'appelle «extension en phase».

Nous allons voir maintenant comment les considérations de probabilité s'introduisent dans l'étude des systèmes complexes. Soit un mélange de molécules de 2 gaz, par exemple d'hydrogène et d'oxygène. La théorie cinétique classique nous enseigne que la vitesse appelée quadratique moyenne des molécules de l'H est de 1838 m/s, et de l'O 461 m/s, à l'état stationnaire et dans les conditions normales, c'est-à-dire à la pression de 76 cm de mercure et à la température de + 273° absolus. Ces vitesses calculées mathématiquement ne sont plus modifiées, dans l'état stationnaire, par les chocs moléculaires, mais les vitesses individuelles des molécules changent et oscillent autour des valeurs moyennes.

Demandons-nous ensuite quelle est la probabilité pour que certaines molécules d'H aient une vitesse s'écartant de 1838 m/sec de $\pm$ 1 cm/sec et pour que certaines molécules d'H aient une vitesse s'écartant de 461 m de $\pm$ 1 cm/sec. En mécanique statistique on adopte d'ailleurs souvent pour la probabilité une définition différente de la définition habituelle. Généralement on entend par probabilité le quotient du nombre des cas favorables au nombre total des cas possibles. En mécanique statistique on prend souvent pour la probabilité seulement le numérateur de la fraction, c'est-à-dire elle est mesurée simplement par le nombre des cas favorables.

(A suivre).

On the Aeolothripid-Complex and the Classification of the Sub-Order TEREBRANTIA (Thysanoptera)

By Dr. Richard S. Bagnall (London)

My attention has been drawn to a paper by Mr. Willy Richter entitled „Beitrag zur Kenntnis der Aeolothripiden (Thysanoptera)" in the *Deutsche Ent. Zeitschr.*, 1928, pp. 29—37. Unfortunately Mr. Richter has overlooked my Memoir on

„The Family *Franklinothripidae* nov. with Description of a New Type of Thysanopteron" *(Ann. Mag. Nat. Hist.*; Ser. 9, XVII, pp. 168—173, fig. Jan. 1. 1926) in which the genera *Franklinothrips* and *Corynothripoides nov.* were diagnosed. It will be seen that Richter's genus *Spathiothrips* must be sunk as a further synonym of *Franklinothrips* and his species *S. bischoffi* is doubtless referable to *F. megalops* (Tryb.).

The synonomy is therefore as follows:

Genus FRANKLINOTHRIPS Back.

Franklinothrips Back 1912, Ent. News, XXIII (Feb.);
Mitothrips Trybom 1912, Ent. Tidskr., XXXIII;
„ Bagnall 1915, Journ. Linn. Soc., Zool., XXXII;
Franklinothrips Bagnall, 1926, Ann. Mag. Nat. Hist., Ser 9, XVII;
Spathiothrips Richter 1928, Deutsche Ent. Zeitschrift.

Franklinothrips megalops (Trybom)

Mitothrips megalops Trybom 1912, ♂, Ent. Tidskr., XXXIII, p. 147;
Franklinothrips myrmicaeformis Zanon 1924, ♀, Atti della Pontificia Accad. delle Scienze Nuovi Lincei, LXXVII, pp. 2—9 (? *Separatum*);
Franklinothrips megalops Bagnall 1926, ♂♀, Ann. Mag. Nat. Hist., Ser. 9, XVII. p. 173; 1927, l. c. Ser. 9, XIX, p. 565;
Spathiothrips bischoffi Richter 1928, Deutsche Ent. Zeitschr., p. 33.

Following the discovery of *Corynothripoides* in West Africa a still more important discovery was made in East Africa and is described in my „Preliminary Description of *Mymarothrips ritchianus* a New Type of Thysanopteron" (l. c., Ser. 10, i, pp. 304—307, Feb. 1928) in which the Aeolothripid-complex is divided into the Super-families *Aeolothripoidea*, *Melanothripoidea* and *Mymarothripoidea* with table.

Further in 1927 I found a most interesting form *(Holarthrothrips* nov.) in the South of France allied to Priesner's fossil genus *Opadothrips*. Priesner had described the genus as near *Melanothrips* but the discovery of a recent species showed that it belonged to the *Heterothripoidea* m. (Bagnall 1927, l. c. ser. 9, XX. pp. 562, *Opadothripidae* nov.) not then represented in Europe other than fossil.

Following the new light these discoveries shed I published „Further Considerations in regard to the Classification of the Order Thysanoptera" (l. c., ser. 10, V, pp. 571—575 May 1930) including a key to the Superfamilies of the Sub-Order Terebrantia which demonstrates the trend of my views on this subject. The most interesting features in respect to this

classification lie in the link afforded by the *Hemithripoidea* with the true 9-jointed antennae of the *Heterothripoidea* on the one hand, showing the transition to the styliform antennae of the *Thripoidea* on the other hand whilst the separation of the *Merothripoidea* serves to stress its approach to the *Tubulifera*. Unfortunately the bulk of the *Hemithripidae* already known are fossil so that the structure of the antennal-sensoria of the forms with true (or freely movable) 9-jointed antennae are not clear; the recent species are Thripid in this respect and it may be that a greater knowledge will show this family to be composed of forms that might more advisedly be taken into the *Heterothripoidea* and the *Thripoidea* respectively.

I append the key to the Suborders of the Terebrantia as follows:

1. Antennae truly 9-segmented; fore tarsal claw usually present 2

   Antennae 6-8-segmented; fore tarsus simple; maxillary palpi 2-or 3-jointed and labial palpi 2-jointed; ovipositor downturned 6

2. Ovipositor upturned, wings usually broad and rounded at ends; palpi varying in form and number of segments 3

   Ovipositor downturned, wings usually narrow and pointed at ends; maxillary palpi 3-jointed and labial palpi 2-jointed 5

3. Antennae with joints 3 and 4 elongated and truly cylindrical; maxillary palpi geniculate, 3-jointed (with 3 much shorter than 2) or 6-8-jointed; labial palpi 3-5-jointed (fore tibia or basal antennal joints never armed . . . Superfamily AEOLOTHRIPOIDEA s. str., with the families *Aeolothripidae* Hal., *Franklinothripidae* Bagn., and *Orothripidae* Bagn.

   Antennae and palpi otherwise; maxillary palpi not geniculate 4

4. Antennae with intermediate joints short, broad and flat, each furnished with at least 3 whorls of forwardly-directed bristles; joint 7 surmounted by a 2-jointed style. Maxillary palpi with a long basal joint and a series of 7 closely connate minor joints; labial palpi 4-jointed. Wings narrow near base, expanding broadly and roundly distally in the form of a battledore as in the *Mymaridae;* the two longitudinal veins of fore wing diverging considerably distally, and costal series of setae continued along the lower margin, which is not truly ciliate . . Superfamily MYMAROTHRIPOIDEA Bagnall containing the family *Mymarothripidae* Bagn.

Antennae normal, joints 3 and 4 not truly cylindrical, and all joints movable (cf. *Heterothripoidea*). Maxillary palpi 3-jointed (3 not markedly inferior to 2), labial palpi 2-jointed (cf. *Heterothripoidea* etc.). Wings broad, several times longer than broad, rounded at end, and fore wings with several cross-veins, lower margin ciliate (cf. *Aeolothripidae* and *Orothripidae);* apex of fore tibia armed with a dagger-like scoop, or, if simple, antennal joint 1 or 2 so armed . . . . . Superfamily MELANOTHRIPOIDEA Bagnall, containing the family *Melanothripidae* Bagn. (recent and fossil).

5. Fore tarsal claw present; antennae with all joints movable (cf. *Melanothripoidea),* Sensoria varying in type according to the family. . . . . Superfamily HETEROTHRIPOIDEA Bagnall, containing the families *Heterothripidae* Bagn., *Opadothripidae* Bagn. (chiefly fossil), and *Stenurothripidae* Bagn. (fossil).

Fore tarsal claw absent; antennae with all joints movable (cf. *Heterothripoidea),* or joints 7-9 more or less connate and/or broadly styliform; sensoria ? ? . . . . Superfamily HEMITHRIPOIDEA Bagnall, containing the family *Hemithripidae* Bagn. (chiefly fossil).

6. Antennae 7-8-jointed, with 6 main joints (6 sometimes with a transverse suture) surmounted by a style of one or two joints; if only 6-jointed, the sixth derived by fusion with stylus (in *Aptinothrips* forms with and without styles occur). Joints 3 and 4 furnished with sense-cones, and not tympanum-like area or areas . Superfamily THRIPOIDEA, s. str. *)

Antennae 8-jointed, all joints movable and joints 3 and 4 with tympanum-like area at end in place of sense-cone. Pronotum with longitudinal dorsal sutures; fore and hind femara markedly thickened, abdomen blunt, ovipositor very weak, apparently functionless . . . . Superfamily MEROTHRIPOIDEA Bagnall containing the family *Merothripidae* Hood (mostly recent).

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*) NOTE. — Forms with 5 main antennal joints (the third being small and without sense-cone) and a style of one or two joints = *Ceratothripidae* Bagn. = *Thripoidea* ff. monstr.