NOTES ON THE NOMENCLATURE OF SOME GRASSES

by

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(Issued March 1st, 1940).

For the incorporation of various grasses in the herbaria of our institutes, we are constantly looking for the correct names to accept, according to the priority. The study of the existing names, as they are given in the Index Kewensis, is therefore indispensable. Working in various genera of the grasses we find, however, that many names are not tenable, because they were accepted without studying the whole literature of the subject. It appeared that various names are omitted in the Index Kewensis, and indications given in various papers are sometimes neglected.

Thus, the well-known and characteristic *Aristida rhiniochloa* HOCHST., already described in the year 1855 and treated by me in the Critical Revision (p. 510) and in my Monograph, is not yet given in the Index, although many of my new species are mentioned.

It is, of course, impossible for the compilers of the Index Kewensis to take up all the existing names without being familiar with the whole literature under a given genus. Monographical studies of the various genera ought to be prepared to make out the names we have definitively to give to a species.

I will demonstrate this with a few examples.

STEUDEL described in his well-known Synopsis in the year 1854 on pag. 53 a *Panicum comosum*. The type was collected by CUMING in the Philippines. This plant belongs to STEUDEL's section VII, which is now regarded as the distinct genus *Setaria*. STEUDEL's Synopsis was published in parts and so we find in his Addenda on p. 417 a quite different *Panicum comosum* from Japan. The type of this Japanese species is preserved in SIEBOLD's collection at Leiden and belongs to the genus *Setaria* too, although it is quite different from CUMING's plant.

Being a Japanese species it was not overlooked by Japanese botanists and Prof. KOIDZUMI placed this species in the year 1930 in the genus *Chaetochloa,* making the combination *C. comosa* (STEUD.) KOIDZ. This species was, however, earlier noted by various other botanists. FRANCHET and SAVATIER described the species as a variety *gigantea* under *Panicum viride* L.

The Japanese botanists MATSUMURA in 1886 and MAKINO in 1911 accepted this variety as a good species; without further investigations, the name *Setaria gigantea* MAKINO is the only tenable one for this species because *Setaria comosa* (STEUD.) HONDA given to our species in the year 1930 is invalid on account of STEUDEL's earlier specific epithet for a plant from the Philippines, which was taken up by MIQUEL already in the year 1855, as *Setaria comosa* (STEUD.) MIQUEL.

HONDA did not verify this, although he could have found this combination in the Index Kewensis. The question is, however, not settled and the nomenclature of this Japanese species becomes interesting, if we study STEUDEL's Synopsis more accurately. STEUDEL himself recognized that he gave the name of *Panicum comosum* twice for two different species and he recognized this fact in preparing his Index. Here we find on p. 458 his *Panicum comosum* as first described by him on p. 53. But the other *Panicum comosum* as described afterwards on p. 417 is mentioned on p. 458 with the addition: "mutetur in pycnocomum". The name *Panicum pycnocomum* STEUD. is once more mentioned in STEUDEL's Index on p. 462 with the data: "lege 417 loco: comosum". *Panicum pycnocomum* STEUD. is therefore a substitute name for the *Panicum comosum* described on p. 417 of STEUDEL's work and is a valid name, because it refers to a valid description under a wrong name. Being a *Setaria* and accepted as a species its true name is therefore **Setaria pycnocoma** (STEUD.) HENR., nov. comb.

There are in the genus *Setaria* important characters to distinguish various plants and in my opinion agrostologists have not always given the necessary attention to such characters. Many years ago when studying the various plants belonging to the well-known *Setaria verticillata* (L.) P. B., I noted already that there are characteristic differences between the plants from the tropical and from the temperate regions. Having formerly explained these differences in my own language, they did not receive the deserved attention by agrostologists, although STAPF cited my paper in his treatment of *Setaria verticillata* P. B. in the Flora of Tropical Africa.

The character I wish to memorate and elucidate here may be accepted as an example of the so-called law of VAVILOV.

In *Setaria verticillata* (L.) P. B. the sheaths have hyaline margins, the latter are densely ciliate-pubescent from the insertion of the blade downwards, the hairs are often spreading and closely appressed. This characteristic pubescence is always well to observe by opening the sheaths cautiously with a needle. This character which seems to be very fugitive, is, however, present in all the specimens from the temperate regions and in those localities where the species is indigenous.

Going over tropical material of our species we observe that the hyaline margins of the sheaths are there quite glabrous. By this character it was possible to divide the *Setaria verticillata*, as commonly understood, into two sharp groups, each with a very different geographical distribution and such groups are worthy of specific rank. As I studied these characters in connection with the material of *Setaria verticillata* found in the Netherlands on ballast introduced from foreign countries, it was possible to recognize the tropical plants among them.

Studying the literature of this subject it appeared, however, that this discovery of mine had already been made by the famous botanist ALEXANDER BRAUN, when he studied so extensively the species of the genus *Setaria*, although he placed this genus under the large genus *Panicum*.

A. BRAUN, who was director of the Botanical Garden at Berlin, unfortunately published his valuable critical study in the year 1871 as an *Appendix plantarum novarum vel minus cognitarum quae in horto regio botanico berolinensi coluntur*, to the seed catalogue of the Berlin Botanical Garden and his important paper enumerating all the known forms of *Panicum verticillatum* L. was consequently the easier overlooked by agrostologists.

ALEXANDER BRAUN's observations are very important for the discrimination of the various forms of this species and even in modern time have not lost their value. The true *Panicum verticillatum* with its character: "vagina foliorum margine ciliato-pilosa", is indicated by BRAUN as "per Europam temperatam et meridionalem divulgatum". Sinai, Asia Minor and North America are further localities belonging to this *P. verticillatum*.

The plants with glabrous sheath-margins were identified by BRAUN as *Panicum Aparine* STEUD. with its character: "vagina foliorum omnino glabra". Although this *Panicum Aparine* is very polymorphous and occurs in forms where sheaths are glabrous or pubescent, it is very

curious that always the hyaline margins of these sheaths are glabrous.

Treating the British-Indian plants and those from Ceylon, BRAUN says expressively "vaginae foliorum inferiorum dorso praesertim et marginem versus pilosa, sed ipso margine non ciliata!".

In the modern light of the species concept, according to the very distinct and constant characters of the formerly accepted subspecies, supported by their distinct geographical distribution, we are certainly correct in accepting both as two separate species. One of them has, of course, to bear the name given by LINNAEUS and becomes *Setaria verticillata* (L.) P. B.

Let us now look at the other species, which occurs in all the tropical regions of the world and was found also in a somewhat aberrant form in Java and described by BRAUN as var. *Miquelii* with ZOLLINGER's number 2729 as type, which was, however, already earlier placed by STEUDEL under *Panicum respiciens* HOCHST. from Abyssinia. This *P. respiciens*, however, does not differ in specific characters from BRAUN's variety *Miquelii* and is, moreover, also STEUDEL's *Panicum Aparine*. It was CHIOVENDA's opinion that this *Panicum Aparine* STEUD. was a distinct species and there is nothing against his idea. Hence the name becomes *Setaria Aparine* (STEUD.) CHIOVENDA. It is published in Nuov. Giorn. Bot. Ital. XIX (1912) p. 419. There is, however, an earlier name for this species. SPRENGEL described in the year 1825 a *Setaria Rottleri* which was based on *Panicum verticillatum* ROTTLER from Ind. Or.. SPRENGEL's description says nothing about the sheaths, although the type locality points certainly to *Setaria Aparine* STEUDEL and ROTTLER's *Panicum verticillatum* was a tropical grass. BRAUN takes up this *S. Rottleri* SPRENGEL as a distinct subspecies indicating the sheath-margins which are not ciliate. It is therefore very probable that SPRENGEL's name belongs to the tropical species and has priority above STEUDEL's name. Recently STAPF has given a list of synonyms of *Setaria verticillata* in the Flora of Tropical Africa. There this species is probably a mixtum of the two constant forms accepted by me as specifically distinct, but the character to distinguish the two geographical forms is not indicated. In the year 1919 CHIOVENDA mentioned our tropical species from Catanga under the name of *Setaria adhaerens* (FORSK.) LK., a combination based on FORSKAHL's *Panicum adhaerens*, but the combination is CHIOVENDA's and not that of LINK. This combination again is not mentioned in the Index Kewensis. STAPF gives *Panicum adhaerens* FORSK. as a synonym under *Setaria verticillata* P. B. and he cited also *Setaria adhaerens* CHIOVENDA.

In an earlier paper: The grasses of British Somaliland (Kew Bulletin

no. 6, 1907, p. 214), STAPF accepted the Indian *Setaria verticillata* of HOOKER as a distinct subspecies under the name of *Setaria verticillata* P. B. subsp. *Aparine* A. BRAUN. This was indeed a far better opinion than the one accepted afterwards in the Flora of Tropical Africa. Although the type of FORSKAHL is not represented in his herbarium and the description is very short and says nothing about the principal character, it is rather evident that FORSKAHL's plant was the tropical *Panicum verticillatum,* so that we have to accept for this tropical species the name **Setaria adhaerens** (FORSK.) CHIOVENDA. This character of the indumentum of the sheath-margins is now also to apply to other polymorphous groups of the genus *Setaria,* where a renewed accurate study of the material will give us a better idea of the various species, as the variability in this genus is astonishing. I will for the moment only call attention to the perennial group to which belongs *Setaria macrostachya* H. B. K. The latter is commonly wrongly interpreted also in the Index Kewensis as a tropical Asiatic and Australian species. Described indeed by the authors of the Nova Genera from Mexico, this species is extraordinarily variable. American agrostologists have given their attention to this species, but did not disentangle the various forms. We have but to look at the various synonyms given by HITCHCOCK in his Manual on pag. 946.

If we study the plants from many localities from Mexico, the Southern United States and California, we find that commonly the sheath-margins are ciliately pubescent. Among the material at my disposal I had also PALMER's No. 125 from La Paz (Lower California), distributed as *Setaria caudata* BEAUV., but placed afterwards by HITCHCOCK under *Setaria macrostachya* H. B. K.

Apart from many other characters and a quite different habit, this plant of PALMER has quite glabrous margins of the sheaths and thus being an important parallel variation in the light of VAVILOV's law, it represents a distinct species too.

Fortunately this plant of PALMER was not overlooked by earlier American agrostologists and so we find PALMER's No. 125 as the type of *Chaetochloa rigida* SCRIBN. et MERR., U. S. Dept. Agr. Div. Agrost. Bull. 21 (1900) p. 30.

This characteristic species being a member of the genus *Setaria* cannot bear the specific name of *rigida,* because there is already a *Setaria rigida* STAPF from South Africa, published a year earlier. I therefore propose the name **Setaria Palmeri** HENR. nov. nom. for *Chaetochloa rigida* SCRIBN. et MERR. The good character of the glabrous sheath-

margins is given by SCRIBNER and MERRILL in their description.

Among the neglected names in the Index Kewensis we find also another one for a species of *Eragrostis* which was renamed in the year 1913 *Eragrostis Scribneriana* HITCHC., as a substitute name for the *Eragrostis pusilla* of SCRIBNER, because there was already an *Eragrostis pusilla* by HACKEL.

There exists, however, a very interesting study of the genus *Eragrostis* by MATTEI from 1919, where this Italian author already recognized the same facts and therefore renamed *E. pusilla* SCRIBN. In this paper the species is named **Eragrostis Pringlei** MATTEI. I give here the complete synonymy of this Mexican species.

Eragrostis Pringlei MATTEI, Ricerche e studî sul genere Eragrostis in rapporto ai nettarii estranuziali per G. E. MATTEI e C. TROPEA. Contribuzioni alla Biologia vegetale, edite dal Prof. A. BORZI. Vol. IV. Fasc. II. Palermo. (1909) p. 241!

= *Eragrostis pusilla* SCRIBNER; BEAL, Grasses N. Amer. 2: p. 481, published in November 1896, non *Eragrostis pusilla* HACKEL, published in September 1896.

= *Eragrostis Scribneriana* HITCHCOCK: Mexican Grasses, in Contrib. U. S. National Herbarium. Vol. XVII. Part. 3. (1913) p. 361!

This species is allied to the well-known North American species *Eragrostis Frankii* C. A. MEYER ap. STEUDEL, Synops. (1854) p. 273, No. 145. The type is preserved in the Herb. Lugd. Bat. (No. 908.87—1700) with the label in STEUDEL's characteristic script reading: "Eragrostis Frankii FISCH. MEYER Hort. Petrop. Linn. 1844.193. Poa tenella Hrbr. un. it. 1835. Miami civitatis Ohio. Dr. FRANK."

American agrostologists accept as the same species *Eragrostis erythrogona* NEES ap. STEUDEL, described by STEUDEL in the same Synopsis under number 141 (priority of place). If this is indeed correct, why did not they call this species *E. erythrogona* NEES? The type specimen is collected by DRUMMOND and hails from St. Louis; I could not check it, but the description perfectly applies to what is commonly called *Eragrostis Frankii*. This is not known from Mexico, but represented there by the allied, although quite distinct *E. Pringlei*.

There occurs in the genus *Eragrostis* another neglected name for a very distinct species, a name not accepted in the Index Kewensis. It is a new valid name for a species, which I wish to treat here more in extenso, especially because the name belongs to a Javanese species of *Eragrostis*, which was found by me as a new member of the grassflora of that island.

This species now received various names and was often misunderstood. We find it already as *Poa chinensis* LINK in the year 1821, renamed on account of *Poa chinensis* L. as *Eragrostis verticillata* LINK, which is once more invalid on account of *E. verticillata* (CAV.) P. B.. In the year 1842 the species received the name of *Poa Purshii* FISCHER, MEYER et A. LALL., which is invalid on account of SCHRADER's name. Afterwards the same species was accepted as a variety of *Eragrostis pilosa* (L.) BEAUV. by COSSON and BALANSA. The latter named the same species in 1867 *E. purpurascens,* overlooking SPRENGEL's name. SACCARDO gave it in the year 1875 the name of *E. nigricans* overlooking the existing *E. nigricans* (H. B. K.) STEUDEL.

In the year 1881 we find the first valid name for this plant, as *E. pilosa* var. *Damiensiana* BONNET, given in exsiccatae without description but published in the same year in "Le Naturaliste" 3e année, No. 52, p. 412—415.

This plant often occurs as an introduced one and so ASCHERSON and GRAEBNER took up this species in their Synopsis as *E. caroliniana,* but the plant is not the *E. caroliniana* of SCRIBNER, the latter based his species on *Poa caroliniana* SPRENGEL. American authors have recently accepted for SCRIBNER's species the name of *E. pectinacea* (MICHX.) NEES. This name *pectinacea* has formerly been misapplied to the perennial *E. spectabilis* (PURSH) STEUDEL. The species we are treating in this paper, is an annual weed.

HACKEL accepted the plant as a var. *condensata* of *E. pilosa* and KNEUCKER published this name in his Gram. exsicc. (1901) No. 115. We cannot take up this name for our species. There is already an *Eragrostis condensata* STEUDEL.

As there existed no valid name for a species so often found as a weed in botanical gardens and on ballast in Central Europe, THELLUNG accepted in the year 1907 our plant as a subspecies of *Eragrostis pilosa* and took up BONNET's name *Damiensiana,* making HACKEL's *condensata* a variety of it.

In 1909 MASSALONGO gave the species the name of *E. Feriolana* as a synonym under *Eragrostis nigricans.* The species was also found on ballast in America introduced from Europe and WIEGAND described this introduced plant in the year 1917 as *E. peregrina,* a name taken up by THELLUNG in the year 1919 as a synonym of his subsp. *Damiensiana.*

However, the above mentioned data are not sufficient to state the exact name of this species, for THELLUNG called in the year 1928 attention to the fact that BONNET in the year 1881, when he published the *E. pilosa* var. *Damiensiana,* says in the text: "L'*E. Damiensiana* mihi (olim) n'a pas

été signalé ailleurs", and THELLUNG had therefore in the year 1907 given this specific name also under his subspecies *Damiensiana*. In the year 1928 THELLUNG treated this species once more in extenso and observed that *E. Damiensiana* and *E. pilosa* are two well-defined species. BRIQUET had the opinion that the name *E. Damiensiana* given together with the subspecies of the same year (1907) is valid and that it is not correct to accept WIEGAND's name *E. peregrina* with *E. Damiensiana* BONNET ex THELLUNG as a synonym.

In THELLUNG's very good, critical study from the year 1928 we find exact determinations and a key for the introduced species of *Eragrostis* such as they are cited in ASCHERSON's Synopsis under *E. caroliniana*. They proved to belong to a number of different species, as *E. mexicana* LINK from America, *E. parviflora* (R. BR.) TRIN. from Australia and *E. suaveolens* BECKER from Russia. *E. Damiensiana* (= *peregrina*) is very exactly characterized in this paper and studying various herbaria THELLUNG found that it is a native of Asia, occurring from Japan to Indo-China. Now it is very curious that a species with such a rather large distribution in Eastern Asia was overlooked by earlier workers in this field. It was therefore quite accidentally that I came across interesting new facts.

Making in our institute some investigations on the genus *Glyceria*, I learned that STEUDEL described in the year 1854 a *Glyceria airoides* from Japan, citing our Institute as possessing the type ("Hrbr. Mus. Lugd. Bat.") with the name "Poa suzumeokatabica" as a synonym.

In our collections, however, which are well-preserved and practicably stored up, no such specimens were found under *Glyceria* nor under *Poa*. In STEUDEL's Index we find *Glyceria airoides* indicated on the correct page 287, but we find the addition p. 426 sub 40 b. On this page the species is once more described, but now as *Eragrostis multicaulis* STEUDEL with at the end of the description the words: "certe Glyceria airoides STEUDEL p. 287 nr. 35 quae delenda". Japonia.

Now our conclusion is that STEUDEL himself recognized that the species he formerly described as *Glyceria airoides* was indeed an *Eragrostis*. He could not give it the name of *airoides* under *Eragrostis*, on account of NEES's existing combination, known to him and treated in the same Synopsis on p. 275. He therefore changed the name into *E. multicaulis* giving at the same time a description. *E. multicaulis* STEUDEL is given in the Index Kewensis as being *E. pilosa* P. B.

Now STEUDEL's types of *E. multicaulis* were found in the cover of *E. pilosa*, because MIQUEL identified them (although wrongly) as *E. pilosa* P. B.

Two sheets in our herbarium bear a slip with the name "Poa suzumenokatabira Jap." STEUDEL's authentic label in his handwriting reads: "Glyceria airoides STEUD. Synops. est delenda est enim vera Eragrostidis species cum E. japonica valde congnata sed diversa. E. multicaulis STEUD. Synopsis Addenda." Another sheet in our herbarium bears only a label by STEUDEL "Glyceria airoides STEUD. Japonia".

Both names *Glyceria airoides* and *Eragrostis multicaulis* were given by the Japanese botanist HONDA as synonyms under *E. pilosa* P. B., probably on account of MIQUEL's identification. And therefore HONDA described the true *E. multicaulis* once more in the year 1927 as a new species, *E. Niwahokori* with the synonym *E. pilosa* STEUDEL non P. B.

HONDA's description and the characters given in his key under *E. Niwahokori* in the year 1930, prove that he described the true *E. multicaulis* (compare: "vaginae ad oras nudae. Rami inferiores ad basin non pilosi, cum pedicellis laeves"). This exactly agrees with STEUDEL's *E. multicaulis* and this name is the correct one for our species.

I have studied this species from a great many localities. Besides the Japanese material I saw this species from KNEUCKER's exsiccatae (No. 115 Hofgarten in Karlsruhe, Germany). Further as *Eragrostis verticillata* P. B. in REICHENBACH's Fl. Germ. No. 2122 (Steiermark, Gräz); Halle a. S. leg. Dr. GARCKE; Botzen in Tirol leg. OUDEMANS; Paris, cour du ministère de la guerre dans l'année 1867, leg. B. BALANSA; Toulouse, allées du Jardin des Plantes dans l'an 1873, leg. B. BALANSA and in PERSOON's herbarium as *Poa elegans* LAMARCK.

Two American specimens were studied; Maine, railroad ballast, Sagadahoc County, Bowdoinham, leg. FERNALD and BAYARD LONG in 1916 (No. 12666 as *E. pilosa*) and Pennsylvania, Plants of Lancaster County by A. A. HELLER in 1900 (as *E. Purshii* SCHRADER).

From the Asiatic region I saw the species from Taiwan (No. 11134) collected and distributed by TANAKA and SHIMADA (sub nom. *E. Niwahokori* HONDA). Important for the knowledge of the Javanese flora is that this species was also found there more than forty years ago, but it was never recognized. Good specimens seen from Java are:
Buitenzorg, leg. HALLIER No. 644a in 1893;
Tjikeumeuh, leg. HALLIER No. 645 in 1893;
Priangan, Melani, Paroengkoeda, alt. 1000 m. leg. BAKHUIZEN VAN DEN BRINK No. 446 in 1909 (nom. incol. djockoet tai kajám);
Tjidadap, Tjibeber, alt. 1000 m. leg. BAKHUIZEN VAN DEN BRINK no. 1681 in 1916.

All these specimens were determined as *E. pilosa* P. B.

One of our well-known Old World species of *Eragrostis* was often accepted as *E. bahiensis* SCHRADER, a species from the New World. For this species the name *Eragrostis chariis* (STEUD.) HITCHC. was recently taken up in America. Now this species which occurs in Java, is as all the species of *Eragrostis* rather plastic and it is therefore no wonder that various described species belong in reality to but a single one.

ROXBURGH described a *Poa elegans* and a *Poa gangetica* both in the same year (1820). These two species belong to the genus *Eragrostis* and are to be combined; *Poa elegans* is invalid on account of the earlier *Poa elegans* of POIRET (1804) and therefore substituted by SCHULTES, who named the species *Poa chariis,* accepting that ROXBURGH's two species, cited above, were two different ones. Hence HITCHCOCK's new combination. But *Poa gangetica* ROXB. belongs to the same species and was wrongly placed by STAPF under *Eragrostis stenophylla* HOCHSTETTER. *Poa gangetica* ROXB. has priority above *Poa chariis* and is therefore to be accepted as the valid name, which becomes *E. gangetica* (ROXB.) STEUDEL. Under this name this *Eragrostis* finds its place among the other species of *Eragrostis* from Java.

Our common and well-known *Eragrostis major* HOST is another inhabitant of Java. There is an endless trouble and disagreement as to the correct name this species must bear. Most agrostologists have accepted the name *E. cilianensis* (ALLIONI) LINK ap. VIGN. LUT., based on *Poa cilianensis* of ALLIONI. This author described and figured his species. The figure in ALLIONI's work is as I could convince myself a rough wood-cut and so bad that one cannot identify it as an *Eragrostis,* the few-flowered spikelets with spreading flowers point as well to a species of *Poa.* The description on pag. 246 of the Flora Pedemontana is equally very bad, so that it is quite impossible to make out that we have here an *Eragrostis* before us. The description says that the branches of the panicle are ternate or quaternate, rarely single. We know that in *E. major* the branches are always solitary along the rhachis, whereas in the genus *Poa* there occur many species with such panicles as described by ALLIONI. We are therefore justified to accept ALLIONI's species as an ambiguous one. To accept a name as valid for a species we have various data which ought to agree. If there is a good plate from which the species is well recognizable, we have a solid basis for the species. The plate must be in accordance with the description, the latter prevails and small differences may be misinterpretations of the author and a minute character may be overlooked. In a description f. i. the spikelets of a grass are sometimes given as

glabrous. In such cases the study of the type proves that they were minutely pubescent and the character was therefore not correctly verified. In the case of *Poa cilianensis,* however, there is an enormous contradiction between the plate and the description. There is in my opinion but one character given in the description that does not point to a *Poa.* ALLIONI gives the mouth of the sheath as pilose, a character not found in our species of *Poa,* but represented in various species of *Eragrostis.* But even if we accept that ALLIONI's species is an *Eragrostis,* we do not know from the description and the plate to what *Eragrostis* they belong. There are at least three species of that genus which occur in Italy; these species are, as given by their old names, *E. major* HOST, *E. minor* HOST and *E. leersioides* GUSS.

In such a difficult inextricable case there is a final decision by consulting the type, that is the specimen from which the author prepared his description, in which case an eventual bad plate may be well eliminated. We must be certain that we can verify the authentic type. And therefore we are justified to put the questions: is there any type existing and if so, who has studied it accurately?

I think that all botanists who had to do with the nomenclature of our *E. major* HOST, have their knowledge of this subject from TRACY HUBBARD's paper in the Philippine Journal of Science, C. Botany, Vol. VIII, No. 3, May, 1913.

HUBBARD says: "there seems to be no doubt as to the identity of the plant which ALLIONI describes. It was collected by BELLARDI on his father's estate of Ciliani in Piedmont and is a low-ground form of *E. major* HOST, *if we can believe subsequent authors.* The description is adequate and fair" (which is scarcely to endorse), "the plate worthless" (which is indeed so).".

HUBBARD says further that the definite status of the species, however, has definitely been settled by Doctor F. VIGNOLO LUTATI, who has examined specimens of *Poa cilianensis* ALL. in the herbaria of BELLARDI, BALBIS and BIROLI, all of them from the type locality and *presumably* received from ALLIONI, whose herbarium, at his death, became the property of BALBIS. For these reasons not verified by HUBBARD himself, he accepts the name *Eragrostis cilianensis* (ALL.) VIGN. LUTATI.

I now wish to call attention to the above cited paper of MATTEI and TROPEA from the year 1909. On pag. 222 MATTEI treated *Eragrostis megastachya* (KOEL.) LINK, which is our old well-known *E. major* HOST. He says verbatim: "Si è voluto riconoscere questa specie nella *Poa cilianensis* di ALLIONI, ma la figura che ne dà l'ALLIONI è talmente orribile,

che puó ascriversi a molte specie diverse: il BERTOLONI aveva creduto di riconoscere in essa la *Poa trivialis.* Inoltre l'ALLIONI assegna alla sua specie infiorescenze con rami verticillati a 3 od a 4, e spighette per solito 3-flore, qualche volta 4-flore, per eccezione 5-flore, caratteri tutti che male si riferiscono alla vera *Er. megastachya.*"

These are the same arguments already discussed by me above, but MATTEI gives more information in a note reading: "ho veduto una nota, che mi era sfuggita, di VIGNOLO LUTATI F. Questa poco sposta la questione, essendo andati dispersi gli esemplari autopti dell'ALLIONI: è vero che nell' Erbario BELLARDI, raccoglitore della specie, ne esistono frustuli, verosimilmente riferibili ad *Er. megastachya,* ma anche i saggi raccolti dal RE, e ritenuti per *Poa cilianensis,* furono dal BERTOLONI riconosciuti spettanti ad una vera *Poa* e precisamente ad una forma anormale di *Poa trivialis.*"

This means that ALLIONI's own specimens were lost and that in the herbarium of BELLARDI, the collector of the species, there are fragments which belong to *E. megastachya,* but also the specimens collected by RE and taken for the *Poa cilianensis.* These were recognized by BERTOLONI as belonging to a true *Poa,* more exactly to an abnormal form of *Poa trivialis.*

MATTEI says further: "Purtroppo tutti gli antichi erbarii non offrono alcuna garanzia di autenticità: vi fu un periodo in cui sedicenti botanici non si fecero scrupolo di asportare o di sostituire esemplari, e di spostare etichette, come se ciò non dovesse apportare danno alla scienza: ora chi può rintracciare i veri saggi corrispondenti alle antiche etichette?"

There must have been a great disorder in these old Italian herbaria and the finding of *Poa trivialis* together with fragments of an *Eragrostis* explains all the characters given in the description of ALLIONI and how the artist who prepared the plate, gave an improvised figure. This plate being quite abominable and worthless, we have only to do with ALLIONI's own description, which points in nearly every respect to a species of the *Poa trivialis* group. On account of all these considerations it is necessary to drop ALLIONI's name. This is not unfortunate, because there exists a good name for *Eragrostis major,* the name *Eragrostis megastachya* LINK based on the *Poa megastachya* of KOELER. This name was formerly used by many agrostologists and there is no doubt about its correctness.

I have further to call attention to the fact that MATTEI recognizes *Eragrostis leersioides* (PRESL) GUSS. as a distinct species, much allied to and often confounded with *E. major.* He gives the differences in

his key on pag. 218 and in a more detailed way on pag. 224. Many localities are mentioned under this species on pag. 229 and 230. A renewed study of this difficult group is highly wanted.

Eragrostis amabilis was based by WIGHT and ARNOTT on *Poa amabilis* L. and although they had a quite different species in mind (our *E. unioloides* [RETZ.] NEES), their combination is a valid one for the species formerly known as *E. plumosa* (RETZ.) LINK. Miss CAMUS in LECOMTE's Flore Générale de l'Indo-Chine is thus quite justified in accepting this name which is also accepted by HITCHCOCK in his well-known Manual. This name is also quite in accordance with the International Rules of Nomenclature. The species is rather common in Java. There occurs there a totally different species, which was accepted by STAPF in HOOKER's Flora of British India as *E. interrupta* BEAUV. (non R. et S. nec TRIN.). For this species HITCHCOCK accepts, however, the name *E. tenella* (L.) P. B. with the name *E. japonica* (THUNB.) TRIN. as a synonym. *Poa amabilis* L. is, however, the same as *Poa tenella* L., which is evident from the types in the herbarium of LINNÉ and *E. tenella* P. B. ex R. et S. is based on this *Poa tenella L.*. STAPF indeed united the two species *Poa tenella* and *Poa amabilis,* but *Poa amabilis,* having priority of place, described on an earlier page, is to be accepted as the valid name, if applied to a species of *Eragrostis.* It is therefore not allowed to apply the name *E. tenella* to another species of *Eragrostis,* as did HITCHCOCK.

Now this other species was described in the year 1784 by THUNBERG as *Poa japonica* and in the year 1791 as *Poa interrupta* by LAMARCK. If the two types of these species belong to but one species of *Eragrostis,* the correct name becomes *Eragrostis japonica* (THUNB.) TRINIUS. Now the types are rather different and belong at least to two varieties and renewed investigations by a monographer may prove that they belong to two different species, in which case it is necessary to clear up their nomenclature. The combination of TRINIUS is clear and safe being the earliest name and not used in a wrong sense. The combination *E. interrupta* is often wrongly based, because there was a *Poa interrupta* described by R. BROWN in the year 1810, a totally different species of *Eragrostis.*

In 1812 BEAUVOIS based his *E. interrupta* on LAMARCK's species, but LAMARCK's name is not cited by him. In 1817 ROEMER and SCHULTES gave in their Systema Vegetabilium Vol. II on p. 577 the name *Eragrostis interrupta* P. B., based on *Poa interrupta* R. BR. In BEAUVOIS's Index on p. 162 *Eragrostis interrupta* and many other names are mentioned with a question-mark. It is certain that in 1812 BEAUVOIS was acquainted with

LAMARCK's plants. ROBERT BROWN's species, published in 1810 were at that time scarcely known to European workers. Anyhow we are correct in accepting the combination *E. interrupta* (LMK.) BEAUV. as valid and other later combinations, f. i. *E. interrupta* STEUD. as belonging to a different species, being at the same time invalid for R. BROWN's species.

If we have to disentangle all the varieties of *Eragrostis japonica* (THUNB.) TRIN., we have to place LAMARCK's species under *japonica* and not the reverse, as did STAPF in HOOKER's Flora of British India. That we have here at least two different varieties is demonstrated by the different form of their panicles and other characters. The genuine *E. japonica* has a stiff panicle with whorled up to 5 cm long branches, which are spreading and branched from the base with divaricate branchlets and filiform or capillary pedicels. The spikelets are, moreover, but few-flowered. Such typical specimens of *E. japonica* are abundantly known from Java. The genuine *E. interrupta* has a long, lax and narrow panicle with semiwhorled, short and dense branches, which are erect or ascendent with short branchlets and shortly pedicelled, erect spikelets, the latter are many-flowered, flowers up to 12 or 14 per spikelet. Accepted as a variety it is to be named **E. japonica** (THUNB.) TRIN. var. **interrupta** (LMK.) HENR. nov. var. This variety occurs in Java too. Its habit is more like the African *E. namaquensis* NEES, which differs, however, in the smooth margins of the palea (compare NEES' statement: "valvula superior ad angulos laevis et glabra").

A very interesting perennial grass was described by TRINIUS in the year 1831 as *Eragrostis collina.* It received very recently the name of *Eragrostis arundinacea* ROSHEV., based on *Aira arundinacea* L. (1753) This name, however, is antedated by *Eragrostis arundinacea* JEDWABNIK, described in the year 1924 from North America. The new species of Miss JEDWABNIK is one of the many blunders of the school of MEZ as it is not an *Eragrostis* at all but belongs to the genus *Tridens* and is at the same time and old and well-known species, already described by LINNAEUS as *Poa flava* in 1753.

The genus *Tridens* is limited to the New World. One of the species, hitherto known as *Tridens Drummondii* (SCRIBN. et KEARN) NASH, based on *Triodia Drummondii* SCRIBN. et KEARN, published in 1897, must bear another name: **Tridens carolinianus** (STEUD.) HENR. nov. comb., based on *Festuca caroliniana* STEUDEL from the year 1854. STEUDEL's name was already taken up by Mrs. A. CHASE, who unites *Triodia* and *Tridens.* The latter, however, is a member of the *Eragrosteae,* whereas the former is to be placed in the tribe of the *Festuceae.* The other North American

species of *Tridens* are already placed in that genus by NASH and others. The South American ones are treated by PARODI.

On account of JEDWABNIK's name that of ROSHEVITZ is invalid in *Eragrostis* and the latter must receive another name. Many authors have accepted *Eragrostis collina* as a member of the genus *Poa* and there is great disagreement as to its true taxonomic position. ASCHERSON and GRAEBNER place this species in their Synopsis, under *Poa* in a separate section *"Psilantha"*, together with the annual *Poa persica* TRINIUS. This *Poa persica,* however, is better distinguished as a member of a distinct genus (*Eremopoa*), whereas *Eragrostis collina* is to be accepted as a species of *Eragrostis.* ASCHERSON and GRAEBNER accept the earlier name *Poa tatarica* FISCHER (1816) in which case its name under *Eragrostis* becomes **Eragrostis tatarica** (FISCH.) HENR. nov. comb.

Recently the genus *Avenastrum* being invalid is now accepted under the name of *Helictotrichon* BESSER. This is a well-defined genus especially represented in Europe and in Tropical and South Africa. The genus was studied in detail by HUBBARD and by SCHWEICKERDT. The island of Java has but a single species, described by BUSE. This species becomes **Helictotrichon Junghuhnii** (BUSE) HENR.. nov. comb. It is much allied to *Avena aspera* MUNRO ex THWAITES, from British India and Ceylon.

The synonymy of the latter is as follows: in *Avena,* MUNRO's name, given in THWAITES, Enum. Pl. Zeyl. (1864) p. 109 has priority although STEUDEL described this species already in the year 1854 as *Trisetum virescens* NEES. The epithet *virescens* in *Avena,* however, is not applicable on account of the already existing different species *Avena virescens* REGEL. In transferring MUNRO's species to the genus *Helictotrichon* we are, however, forced to accept STEUDEL's name as being the earlier one and the British Indian species becomes thus **Helictotrichon virescens** (NEES) HENR. nov. comb. based on *Trisetum virescens* NEES ap. STEUDEL.

Another species from the Nilghiri Hills belongs to the same genus and is proposed here as **Helictotrichon polyneurum** (HOOK. F.) HENR. nov. comb., based on *Avena polyneura* HOOK. F.

Avena virescens REGEL, accepted as being a species of *Trisetum* and named therefore *Trisetum virescens* (REGEL) FEDTSCH. ought to be renamed on account of the already existing *Trisetum virescens* NEES. I propose for this species of REGEL the new name **Trisetum Fedtschenkoi** HENR. nov. nom. based on *Trisetum virescens* (REGEL) FEDTSCH. (1914) non NEES ap. STEUDEL (1854).

Avena aspera MUNRO, as it is treated by HOOKER, in his Flora of

British India, is a very variable species and it consists in my opinion of a mixture of quite distinct minor groups, which are to be accepted as separate species. This is already evident from the various alternative characters mentioned by HOOKER and it is from all the data given by HOOKER not very easy to establish the various species, concealed under his *Avena aspera, proper.*

I have seen plants from the Khasia Hills and from Sikkim besides others from the Nilghiri Hills and also specimens from Yunnan. Striking differences are present in the form of the panicle and in the length of the spikelets, moreover also in the length of the ligules. This last mentioned character is of great importance in the genus *Helictotrichon* and together with characters of the blades, used with succes for the discrimination of various much allied, although quite distinct species. Recently a fine treatment of the grasses was published in the Flora of the U. S. S. R. by KOMAROV and his co-operators. The study of such a work, how interesting it may be, is greatly hampered on account of the Russian language in which the flora is written. We learn from it only the genera with the various species and the synonyms. The keys for the species cannot be consulted by botanists who are not familiar with that language.

Another recent work where MUNRO's species in treated is HANDEL-MAZZETTI's Symbolae sinicae. Here (l. c. p. 1293) *Avena aspera* is treated as *Avenastrum asperum* (MUNRO) HAND.-MAZZ., a combination invalid on account of the much earlier *Trisetum virescens* STEUD. At the same time a var. *Roylei* (HOOK. F.) HAND.-MAZZ. is given with *Avena Delavayi* HACK. as a synonym. I examined *Avena Delavayi* HACK. from Yunnan published in HACKEL's Neue Gräser (Oest. Bot. Zeit., 1902, No. 5, p. 189). HACKEL gave a long description and compared his species with the European *Avena versicolor* VILL.

We fully agree that HACKEL's *Avena Delavayi* and VILLAR's *Avena versicolor* are two quite distinct species; as to his *A. Delavayi,* HACKEL observed in his own herbarium afterwards that his species was a small narrow-leaved variety of *Avena aspera* MUNRO, mentioned by HOOKER as var. *Roylei.* The material from British India seen by me and cited above has very short ligules, scarcely ½ mm long, in HACKEL's species the ligules are 1½ mm long and very distinct, in one of my specimens from DELAVAY even 2 mm in length. The spikelets are much smaller than commonly in *Avena aspera* MUNRO and in my opinion these plants from Yunnan are not at all only a small narrow-leaved highland form of MUNRO's species. Such an interesting "form" is moreover not a variety,

but by its striking characters, so often used in the genus with great profit, to be accepted as a distinct species.

I do not hesitate to accept for this species the name **Helictotrichon Delavayi** (HACK.) HENR. nov. comb., based on *Avena Delavayi* HACK. It may be that HOOKER's variety *Roylei* belongs to HACKEL's species, although some characters in HOOKER's description do not point to HACKEL's species. HOOKER says: panicle glabrous (or puberulous), flowering glumes 2-fid almost to the awn into acuminate or long-awned lobes (or split into 3—4 short unequal bristles). The characters given inter parenthesis do not apply to HACKEL's species, and HOOKER's variety is a mixture of different things. However this may be, the existence of HOOKER's earlier variety does not invalidate at all the standing of HACKEL's plant as a species.

HACKEL's species is in its habit more allied to the plants from the Nilghiri Hills. These plants were published by HOOKER as var. *Schmidii* with the observation: Possibly a distinct species. This variety differs from HACKEL's species in the very short ligules and in the chiefly radical tuft of leaves, more contracted panicle, short rachis and branches and very short pedicels. The spikelets are of the same length. For this endemic species from the Nilghiri Hills I propose the name **Helictotrichon Schmidii** (HOOK. F.) HENR. nov. comb., based on HOOKER's varietal name under *Avena aspera* MUNRO.

Helictotrichon as a genus is always easily recognizable, but the treatment of the about 80 species all over the world is not an easy task and ought to be undertaken by a monographer on the basis of the modern species concept. This inquires renewed investigations from the types which are scattered through the various institutes of the world and at the moment cannot be brought together. Such a work was undertaken by SAINT YVES in a paper: Contribution a l'étude des Avena sect. Avenastrum, published in the year 1931 in Candollea Vol. IV. p. 353—498.

In this work I am disappointed. Being a pupil of the histotaxic school of DUVAL-JOUVE, SAINT YVES has given much weight to the anatomical characters of the blades. Although SAINT YVES says that he tried "à connaître les ressemblances dans les choses diverses et les différences dans les choses semblables", his method for a monographical study is wrong. For histotaxic investigations it is in my opinion, wrong to rely on material in our collections and on the current names given to that material. To be sure that our conclusions are correct, we have in the first place to look for the actual types of all the species supposed to belong to a genus that we wish to disentangle. All the types are to be checked with

the authentic descriptions and localities and the various data ought to be ascertained. After this work, all the other material at hand ought to be carefully studied and identified and deviations from the type material are to be fixed. A monographical study should be prepared first of all on morphological foundations. When such a work is done we can pass on to anatomical investigations and execute them first on the types of the various species. Only in such a case we are absolutely safe that anatomical characters found by us correspond to the correct species. SAINT YVES treated 21 species, many types were not seen by him and in other cases material named in herbaria was studied in the supposition that it was correctly identified. A great many species are thrown together, neglecting the constant and important differences. Many good and characteristic species are by this treatment concealed under the innumerable amount of varieties and are thus practically lost. A next investigator is thus forced to do once more a great amount of work and has to execute once more all the anatomical work on the basis of the type specimens. If in such a work, as prepared by SAINT YVES, various correct conclusions are obtained, without being verified with the types, it is more by hit than by wit; but in monographical work we can leave nothing to chance. SAINT YVES's method, at present still often propagated is putting the horses behind the carriage.

TRABUT, who did not neglect the anatomical structure of the leaves of various grasses of North Africa, demonstrated clearly that the leaf structure of various species of *Stipa* as *Stipa gigantea, Stipa juncea, Stipa Lagascae* and *Stipa capillata* is completely realized in various perennial species of *Avena* from the section *Avenastrum*, such as *Avena convoluta* and *Avena filifolia*. Their anatomical structure is so uniform that without inflorescences these plants cannot be distinguished although in this case they belong to two quite different genera. TRABUT has demonstrated this with figures in Bull. Soc. bot. de France Tom. XXXVI (1889) p. 404—412.

The anatomical structure in *Avenastrum* shows two principal types, one with flat leaves, the other with junciform ones. In these two groups the anatomical differences are at once distinct although the differences are at first sight also obvious to a taxonomist. To divide those two groups TRABUT was, however, forced to use in an analytical key, only characters taken from the floral parts as glumes and lemmata, hairs on the callus, number of flowers etc., all used already with succes by taxonomists for an incorporation.

An interesting species was described by Miss CAMUS from Madagas-

car with only two flowers per spikelet. It is **Helictotrichon Humbertii** (CAMUS) HENR. nov. comb., based on *Avenastrum Humbertii* CAMUS.

There are three species of *Helictotrichon* in North America. For the incorporation in our herbaria they have to bear the following names: **Helictotrichon pubescens** (HUDS.) PILGER; **Helictotrichon Hookeri** (SCRIBN.) HENR. nov. comb., based on *Avena Hookeri* SCRIBNER and **Helictotrichon Mortonianum** (SCRIBN.) HENR. nov. comb. based on *Avena Mortoniana* SCRIBNER. The South American *Avena scabrivalvis* TRIN. is according to SWALLEN an *Amphibromus*.

Other interesting species of the genus *Helictotrichon* are the following:

Helictotrichon Fedtschenkoi (HACK.) HENR. nov. comb. based on *Avena Fedtschenkoi* HACK. from Turkestan.

Helictotrichon Schellianum (HACK.) HENR. nov. comb. based on *Avena Schelliana* HACK. in the Ural.

Helictotrichon asiaticum (ROSHEV.) HENR. nov. comb. = *Avenastrum asiaticum* ROSHEV.

Helictotrichon tianschanicum (ROSHEV.) HENR. nov. comb. = *Avenastrum tianschanicum* ROSHEV. from Turkestan.

Helictotrichon albinerve (BOISS.) HENR. nov. comb. = *Avena albinervis* BOISS. from Portugal and Spain.

Helictotrichon adzharicum (ALBOV) HENR. nov. comb. = *Avena adzharica* ALBOV in Acta Horti Tifl. Suppl. I (1895) p. 257.

Helictotrichon armeniacum (SCHISCHK.) HENR. nov. comb. = *Avena armeniaca* SCHISCHK.

Helictotrichon asiaticum (ROSHEV.) HENR. nov. comb. = *Avenastrum asiaticum* ROSHEV. This is the *Avena versicolor* of the Asiatic authors which is different from the European species.

Helictotrichon dahuricum (KOMAR.) HENR. nov. comb. = *Avena dahurica* KOMAR. This is the *Avena planiculmis* of TURCZANINOV as mentioned in his Fl. baic. dahur. III (1856) p. 322, not *Avena planiculmis* SCHRADER from Central Europe. I had an authentic specimen of TURCZANINOV at my disposal from the Leningrad herbarium. We have here the case that the differences between two much allied species are supported by a very distinct geographical distribution as has already so often been demonstrated by me.

Helictotrichon compressum (HEUFF.) HENR. nov. comb. = *Avena compressa* HEUFFEL from Southern Europe and North Africa.

Helictotrichon bromoides (GOUAN) HENR. nov. comb. = *Avena bromoides* GOUAN from Southern Europe and North Africa.

Allied to this is **Helictotrichon Letourneuxi** (TRAB.) HENR. based on *Avena Letourneuxi* TRABUT from Tunis.

Helictotrichon Hackelii (HENRIQUES) HENR. nov. comb. = *Avena Hackelii* HENRIQUES from Spain.

Helictotrichon setaceum (VILL.) HENR. nov. comb. = *Avena setacea* VILLARS, French Western Alps.

Helictotrichon compactum (BOISS. et HELDR.) HENR. nov. comb. = *Avena compacta* BOISS. et HELDR. in Greece.

Helictotrichon agropyroides (BOISS.) HENR. nov. comb. = *Avena agropyroides* BOISS. in Greece.

Helictotrichon filifolium (LAG.) HENR. nov. comb. = *Avena filifolia* LAGASCA from Southern Spain and North Africa.

Much allied is **Helictotrichon convolutum** (PRESL) HENR. nov. comb. based on *Avena convoluta* PRESL from Italy.

Helictotrichon decorum (JANKA) HENR. nov. comb. = *Avena decora* JANKA from the Carpathians.

Helictotrichon sulcatum (GAY) HENR. nov. comb. = *Avena sulcata* J. GAY from Spain, Portugal and Western France.

Helictotrichon montanum (VILLARS) HENR. nov. comb. = *Avena montana* VILLARS from Spain, Central and Western France.

Helictotrichon macrostachyum (BALANSA) HENR. nov. comb. = *Avena macrostachya* BALANSA, pl. alg. exsicc. no. 718, is a very fine North African species.

Helictotrichon breviaristatum (BARR.) HENR. nov. comb. = *Avena breviaristata* BARRATTE ap. BATTANDIER et TRABUT Fl. de l'Algérie (1895) p. 184 is a curious North African species, characterized by its very short included awns..

Helictotrichon pruinosum (HACK. et TRAB.) HENR. nov. comb. based on *Avena pruinosa* HACKEL et TRABUT and

Helictotrichon Requienii (MUTEL) HENR. nov. comb. based on *Avena Requienii* MUTEL, are two species from Oran.

Helictotrichon Neumayerianum (VIS.) HENR. nov. comb. = *Avena Neumayeriana* VISIANI from Albania and Dalmatia.

Helictotrichon Blauii (ASCH. et JANKA) HENR. nov. comb. = *Avena Blauii* ASCHERSON et JANKA (1877). This species from the Balkan is indicated by ASCHERSON and GRAEBNER in their Synopsis as occurring in Tirol (l. c. p. 257). This is, however, wrong as the genuine *Avena Blauii* does not occur in Tirol. The plant from the latter locality is a variety of **Helictotrichon pratense** (L.) PILGER accepted by me as var. **pseudolucidum** (HAUSM.) HENR. nov. comb.

Helictotrichon alpinum (SM.) HENR. nov. comb. = *Avena alpina* SMITH (1811).

Helictotrichon Krylovii (PAVL.) HENR. nov. comb. = *Avenastrum Krylovii* PAVL. in Animadv. syst. Herb. Univ. Tomsk. no. 5—6 (1933) p. 1.

Helictotrichon hissaricum (ROSHEV.) HENR. nov. comb. = *Avenastrum hissaricum* ROSHEV. in Bull. Jard. Bot. Acad. Sc. U. R. S. S. XXX (1932) p. 770.

Helictotrichon mongolicum (ROSHEV.) HENR. nov. comb. = *Avena mongolica* ROSHEV. in Bull. Jard. Bot. Princip. XXVII (1928) p. 96.

For a new treatment of the grasses of Java, I have once more studied the genera *Brachiaria* and *Urochloa*. These two genera are well established, although the position of the spikelets being adaxial or abaxial is not always at once evident, especially in dried material. Here we have at first the common *Panicum reptans* L., accepted by STAPF as an *Urochloa* and very recently by GARDNER and HUBBARD as a *Brachiaria*. American authors although accepting the genus *Brachiaria* are still going on to accept this species as a true *Panicum*, because they limit the genus *Brachiaria* not only to those species, where the spikelets are placed with the back of the fruit turned away from the rhachis of the racemes, but also being at the same time solitary. Compare *Brachiaria extensa* CHASE, *Brachiaria plantaginea* (LINK.) HITCHC. etc. In STAPF's treatment of the African species of *Brachiaria* there are many species with binate spikelets, in which case one of them is sometimes rather long pedicelled.

For *Panicum reptans* L., occurring also in Java, we had therefore to take a decision, and I studied the case once more, going over all the material available. In the sessile spikelets of each pair the situation is clear, the first small glume is adaxial, turned towards the rhachis, but in the pedicelled spikelets it seems that they are abaxial, turned away from the rhachis. Now this character, abaxial or adaxial, is not always sharply to determine in dried material on account of a torsion of the pedicel after drying or pressing the plants and the character is therefore more evident in fresh material. By soaking inflorescences in water we observe, however, that the true position is better to understand, as the spikelets are then coming in their old true position. I now agree with Mr. HUBBARD that several species formerly placed in the genus *Urochloa* indeed belong to the genus *Brachiaria* and that our javanese

Panicum reptans L. must therefore bear the combination *Brachiaria reptans* (L.) GARDN. et HUBBARD.

The genus *Urochloa* is thus hitherto not represented in Java. At the same time a number of species are grouped together where the spikelets have more agreement as to form and outline. Mucronate or awned lemmata occur in both genera.

Among the species of *Brachiaria* is also the *Brachiaria epaleata* STAPF, published in the year 1919, as a new name for RICHARD's *Panicum nudiglume,* which is different from the true *Panicum nudiglume* HOCHSTETTER published earlier (in 1844). STAPF overlooked that his species was already described in the year 1917 by MEZ as *Panicum secernendum* HOCHSTETTER, a manuscript name validated by MEZ and published with a description. Hence this species becomes **Brachiaria secernenda** (HOCHST.) HENR. nov. comb.

Another interesting species of *Brachiaria* was formerly received by me from my late friend Prof. A. S. HITCHCOCK, who collected it in grassland near Eldoret in Kenya. It was accepted by him as *Brachiaria soluta* STAPF, but although belonging to the section of the "*reticulatae*", it differed by the not herbaceous and not ribbonlike rhachis of the racemes and by other characters of the spikelets.

Not having sufficient material for comparison at my disposal, I asked Mr. HUBBARD at Kew for his opinion. I have to thank him for his valuable advice and his willingness to compare my new species with other members of the group of the *reticulatae.* This new species is proposed here as

Brachiaria keniensis HENR. nov. spec. — Caespitosa, sine stolonibus. Culmi erecti, paucinodes, infra nodis barbati sed nodi ipsi glabri. Vaginae foliorum glabrae, leviter scaberulae, marginibus pilosis, ligula brevissima, ciliolata, pilis stipata. Laminae planae, ad 7 mm latae, 10 cm vel plus longae, caulinae ad 4 cm tantum longae. Pedunculus leviter pubescens, inflorescentia pinnata, 6—7 cm longa, axis communis triqueter, dense setigera, rami 3—4, 1.5—2.5 cm longi, dense floriferi, circa ½ mm lati, dense pubescentes, pilis setigeris intermixtis; spiculae dense agregatae, subsessiles, subsecundae, circa 4½ mm longae; gluma I scaberrima, spicula $^1/_5$ brevior, lata, purpurea, multinervosa, nervis circa 13, parallelis; gluma II superior 8—9-nervia, hyalina, albida, nigropunctata, subacuminata, pilis longis hyalinis sparsis obtecta, reticulata; flos inferior neuter vel masculina, 4 mm longa, bipaleacea, palea inferior hyalina, reticulata, 5—7-nervia, ut in gl. II pilis obtecta, acuminata, palea superior hyalina, glabra, acuminata, circa 5(—7)-nervia; flos superior

hermaphrodita, lemma obtusa sed mucronula distincta praedita, longitudinaliter punctulata vel leviter subreticulata, albidula, subnitens, coriacea.

Kenya Colony: Eldoret, Sept. 20. 1929 in grassland leg. A. S. HITCHCOCK No. 24998. Typus speciei in Herb. Lugd. Bat. sub No. 932.28—150.

This species is most allied to *Brachiaria dictyoneura* (FIG. et DENOT.) STAPF, but differs in the wider 13-nerved lower glume, the smaller spikelets and the distinct mucro at the summit of the fertile lemma, also allied to *Brachiaria viridula* STAPF from which it differs in the larger 13-nerved lower glume and slightly larger spikelets and in the longer mucro of the punctulate, not smooth lemma. *Brachiaria humidicola* (RENDLE) SCHWEICK. has a different habit, being a stoloniferous perennial.

To *Brachiaria keniensis* HENR. belongs also a specimen from Nyassa, Kyimbila, collected by A. STOLZ in 1912 (no. 1091). It was placed by MEZ under *Panicum jubatum* FIG. et DENOT. (*Brachiaria jubata* STAPF) and is a certainly much allied species from Kordofan. It differs according to the figures, given by FIGARI and DENOTARIS in the very long hairs of the racemes, which are as long as the spikelets.

There is another puzzling question as to the place of a common species of *Panicum* in the system of the *Panicoideae*. It is the species commonly known as *Panicum barbinode* TRIN.. *Panicum purpurascens* RADDI from the year 1823 also described from Brazil is an earlier name, but not accepted on account of the earlier *Panicum purpurascens* OPIZ (1822). HITCHCOCK has demonstrated that OPIZ's name is a nomen nudum and therefore RADDI's name is the valid one. American agrostologists have accepted this name. STAPF identified this species with LAMARCK's *Panicum numidianum* and also with FORSKAHL's *Panicum muticum*. BLATTER, in his Revision of the Flora of the Bombay Presidency, accepting *Brachiaria mutica* (FORSK.) STAPF says that "in adopting FORSKAHL's name "*muticum*" for this species, STAPF, according to his own words, has relied on ASCHERSON's identification of the type with the Algerian *P. numidianum*". Now in so much allied plants such identifications ought to be given by good figures of the spikelet characters, as is done by HITCHCOCK and CHASE in their beautiful study of the American species of *Panicum* and *Paspalum*. Now the species of LAMARCK was examined by HITCHCOCK in the LAMARCK herbarium at Paris. He found that this type did not agree in all respects with the type of *Panicum barbinode* TRIN.

HITCHCOCK gives as the most important differences, that the lower glume in LAMARCK's plant is longer and 3-nerved instead of 1-nerved, the pedicels of the stalked spikelets are longer, and the rhachis lacks the long hairs of *P. barbinode*. If we look at the material in our herbaria we find that specimens agreeing with LAMARCK's type exist, especially the 3-nerved, longer, lower glume is noticeable.

As to FORSKAHL's plant HITCHCOCK and CHASE observe that the identity of this species is uncertain, the description is insufficient to identify it. The type, collected at Rosetta and said to be allied to *Panicum colonum* is represented in FORSKAHL's herbarium at Copenhagen, but STAPF did not indicate that he verified this type. So far as our knowledge goes at the moment, there are two much related, but distinct species, the one is *Panicum numidianum* LMK. and the other *Panicum purpurascens* RADDI. Only the latter occurs in Java, it is a native of Brazil, cultivated throughout subtropical and tropical regions as *"Para grass"* and is often escaped from cultivation. Placed by HITCHCOCK and CHASE in the group of the *"geminata"* it does not belong there but is a member of the genus *Brachiaria,* whereas the two other species of the *"geminata"*, *Panicum geminatum* and *P. paludivagum* are members of the genus *Paspalidium* and have to bear the names of **Paspalidium geminatum** (FORSK.) STAPF and **Paspalidium paludivagum** (HITCHC. et CHASE) HENR. nov. comb. based on *Panicum paludivagum* HITCHC. et CHASE (North America, in Florida and Texas, to Mexico and Guatemala. South America, Uruguay and Argentina).

The two species of *Brachiaria* may be accepted as **Brachiaria numidiana** (LMK.) HENR. nov. comb. for the Egyptian plant and **Brachiaria purpurascens** (RADDI) HENR. nov. comb. for the well-known Para grass. Very recently HITCHCOCK has once more, and sharper published his opinion about these two species in his Manual of the grasses of the West Indies. In HITCHCOCK's opinion *P. purpurascens* is different from *P. numidianum* to which *P. muticum* should probably be referred. The Egyptian plant differs in having pubescent, but not villous nodes, more acute spikelets, no long hairs on the rhachis and pedicels, and a larger first glume. I agree perfectly with this opinion, having compared North African material. The renewed exact examination of FORSKAHL's type is necessary to solve this problem. At the moment we have no access to this valuable type.

Having seen the type and duplicates from HACKEL's interesting *Panicum Venezuelae* (EGGERS no. 13471), which was placed by the emi-

nent agrostologist already in the subgenus *Brachiaria,* I wish to make the combination **Brachiaria Venezuelae** (HACK.) HENR. for the incorporation of this species in our herbarium.

The orientation of the spikelets in *Brachiarias* with undivided branches and shortly pedicelled spikelets is readily ascertained as is clearly demonstrated by HUBBARD; in many other members of this genus, the adaxial arrangement is obscured and difficult to determine. In *Brachiaria Venezuelae* we have a quite similar case as in *Panicum reptans.* Most of the spikelets of the groups along the branches have a lower glume turned towards the rhachis, at least the shortly pedicelled ones; in the longer pedicelled spikelets at the end of the branchlets and at the summit of the branches it does not show this position so clearly, because these spikelets are protruding above the axis. In the dried material the position of the spikelets is somewhat altered by torsion. An exact examination demonstrates, however, the same position as in so many other species of the genus *Brachiaria.* The general form of the spikelets in *Brachiaria Venezuelae* and especially the fertile lemma, agree better with other members of this genus and do not fit among the characters of the genus *Urochloa.* For these reasons I placed the species of HACKEL in the genus *Brachiaria.*

In New Caledonia there occurs another species of this genus, which was described by MEZ as *Panicum patulum,* a name which is not valid on account of the earlier *Panicum patulum* (SCRIBN. et MERR.) HITCHC. For the species of MEZ I propose the name **Brachiaria Balansae** HENR. nom. nov. based on the species as described by MEZ.

Another species from New Caledonia was described by MEZ as *Panicum elegantulum.* This plant belongs to the genus *Paspalidium,* for which I make the new combination **Paspalidium elegantulum** (MEZ) HENR. nov. comb.

Panicum glabrinode HACK. in Annuaire du Conservatoire et du Jardin botaniques de Genève, Vol. XVII. p. 284 and compared by him with *Panicum numidianum* LAMK. and *Panicum barbinode* TRIN., is a member of the genus *Brachiaria,* for which the name **Brachiaria glabrinodis** (HACK.) HENR. nov. comb. is to be accepted.

Panicum oligobrachiatum PILGER was described from the Lower Congo near Bonga and was collected by SCHLECHTER (no. 12663). I saw this number and the species is certainly a member of the genus *Brachiaria.* STAPF treated it in the Flora of Tropical Africa but did not transfer it to the genus *Brachiaria,* probably on account of the wanting lower parts of the existing type material. For the intercalation of the species

it has to bear the name **Brachiaria oligobrachiata** (PILGER) HENR. nov. comb. It is not mentioned by ROBBIJNS in his Flore Agrostologique du Congo Belge, II, Panicées.

A few other species of *Panicum* from South Africa, already placed by its author in the section *Brachiaria,* are here transferred to that genus.

Brachiaria bulawayensis (HACK.) HENR. nov. comb. based on *Panicum bulawayense* HACK.

Brachiaria melanotyla (HACK.) HENR. nov. comb. based on *Panicum melanotylum* HACK.

Brachiaria glomerata (HACK.) CAMUS (Bull. Soc. Bot. France, T. 77, 1930, p. 640) based on *Panicum glomeratum* HACK. is omitted in Index Kewensis.

Panicum pubifolium MEZ is invalid on account of the earlier valid combination *Panicum pubifolium* NASH in 1894. I propose for MEZ's species the name of **Brachiaria ukambensis** HENR. nom. nov. based on HILDEBRANDT'S type from Ukamba (no. 2665).

In the genus *Cyrtococcum* there is still much confusion and the various species ought to be studied and revised on a new basis. The genus as a whole is very distinct and always easily recognizable. It therefore seems rather bold to accept a new species in this genus as did HACKEL in describing his *Panicum Schmidtii* from Siam where other species of this genus are abundant. Miss CAMUS accepted HACKEL's species as a variety of the very variable *Cyrtococcum patens* (L.) CAMUS. But here I cannot follow her. *Panicum Schmidtii* is distinguished from all the other members of the genus *Cyrtococcum* by the very curious indumentum of the spikelets, the latter are moreover the smallest in the genus and scarcely 1½ mm long, they are provided with extremely characteristic verrucas, which resemble a small toadstool. This character is very exactly expressed in the author's description as "verrucis crebris elevatis breviter piliferis obsita". This species is not limited ti Siam. I saw it also from British India in the Bombay Presidency, collected by YOUNG in Southern Maratha County and North Canara. It is certainly overlooked as it occurs also eastward to Indo-China. Belonging to the genus *Cyrtococcum* we have to place it there as **Cyrtococcum Schmidtii** (HACK.) HENR. nov. comb.

There occur in Java two species of *Agrostis* of the group where the palea is wanting. Both were exactly described by BUSE and they are well recognizable. Their synonyms are the following: REINWARDT named in his herbarium a species as *Agrostis montana,* a name he did

not publish. His specimen with an authentic label in our herbarium reads: "Pontjac gedée, Agrostis montana RWDT". VAN HALL added to this specimen: "non R. BR." and named this specimen *Agrostis Reinwardtii* v. HALL mss. Meanwhile BUSE, who had no access to this plant, described the same species as *Agrostis stricta* BUSE (Feb. 1854) p. 341 in Plantae Junghuhnianae from good specimens collected by JUNGHUHN, but overlooked that there was already a species of this name by TRINIUS. (There is moreover also an *Agrostis stricta* by WILLDENOW from the year 1797). BUSE received afterwards the authentic specimen of REINWARDT with VAN HALL's manuscript name. This specimen bears also a label by BUSE reading: "Agrostis Reinwardtii H. L. v. HALL mss. BUSE in Pl. Reinw. p. 98. Agr. stricta Buse in Pl. Jungh. p. 341. Speciei auctor. Specimina auth. Pl. Reinw. p. 1." MIQUEL published these data in his Addenda to the 3th volume of his Fl. Ind. Batavae p. 750 with a reference to *Agrostis stricta* BUSE on p. 377 of his Flora, as follows:

"Agrostis stricta BUSE, sed hon TRIN. Agrostogr. II p. 97 = Agrostis Reinwardtii H. C. v. HALL. in sched. herb. Reinw. — BUSE in Pl. Reinw. p. 98 (A. montana REINW. herb. non R. BR.)".

From these citations it is evident that BUSE's second publication was known to MIQUEL, a publication given in the year 1856 by G. H. DE VRIESE, Plantae Indiae Batavae orientalis. Fasc. I et II Gramineae auct. L. H. BUSE. This publication has therefore priority above MIQUEL's data.

BUSE gave in this publication the full data as follows:

"Agrostis Reinwardtii H. L. v. HALL in schedula mss. BUSE. Agrostis (Trichodium) stricta BUSE in Pl. Jungh. p. 341, speciei auctor. Non Agr. stricta TRIN. agr. II. p. 97. Agr. montana RWDT. in sched. herb. mss. Non Agr. montana R. BROWN Prod. Fl. Nov. Holl. p. 171. Habitat insulam Javae ubi in planitie centralo montium Gedeh prima vice ao. 1818 legit RWDT. Simili loco montis Mandalawangi postea Jungh. l. op. 1. Speciem descripsi in pl. Jungh. l.l. At nomen "strictae" non fauste adhibui qua scilicet denominatione jam TRINIUS antea plantam designaverit Chilensem."

The name *Agrostis Reinwardtii* v. HALL therefore is a substitute for BUSE's *Agrostis stricta* and is the valid name of this Javanese grass, therefore the citation of this name in the Index Kewensis is incorrect. This species is easily recognizable from BUSE's very good description by its perfectly smooth panicle branches and pedicels and by its larger spikelets, from BUSE's *A. infirma*, which has very distinctly scabrous panicle branches and smaller spikelets. We know how accurate an ob-

server BUSE was. I have explained these data here more in detail, not only for a new treatment of the grasses in BACKER's Handboek, but also because there is still another difficulty. We know that MIQUEL has taken up in his well-known Flora a third species of *Agrostis*, which has been described by STEUDEL in the year 1854 (posterior of BUSE) as *A. rigidula*, giving as his type a plant collected by ZOLLINGER (No. 2589). MIQUEL indicates that he did not see it.

This is quite correct, because the plant of ZOLLINGER is wanting in our collections. But KOORDERS accepted STEUDEL's species, which is described as having scabrous panicle branches but with a distinct palea, a character given also by MIQUEL. KOORDERS identified plants found by him as *Agrostis rigidula* STEUDEL. These plants are in our herbarium, but a new examination proved that in KOORDERS's plants the palea is totally wanting and his plants do not differ from BUSE's *Agrostis infirma*. I do not know how KOORDERS could determine his plants as STEUDEL's species, without having an authentic specimen at hand. It may be that he consulted only MIQUEL's Flora and did not verify the character of the wanting or present palea. Nevertheless we do not know exactly at this moment what species STEUDEL described. There are two possibilities. STEUDEL had one of the specimens of BUSE and overlooked the wanting palea, or he had indeed an *Agrostis* with a distinct palea before him. Because the lemmata in *Agrostis* are rather small, it not rarely occurs that in the dissections the thin lemma tears and without utmost care, a small part of the true lemma may be taken for the palea, as the lemma splits lengthwise rather easily. Fortunately the name *Agrostis infirma* BUSE is quite safe as given in 1854 before the publication of that part of STEUDEL's work, where *A. rigidula* is issued. But if STEUDEL's *A. rigidula* proves to be the *Agrostis stricta* of BUSE, then *A. rigidula* has priority above *Agrostis Reinwardtii* V. HALL. There is, however, another possibility that STEUDEL's species had indeed a well-developed palea, in which case it may belong to the European *Agrostis stolonifera* L.

This *Agrostis stolonifera* L., as sharply limited by PHILIPSON in his important recent revision of the British species of the genus *Agrostis*, is known from Java, where it was found on the West slope of Mount Tengger between 1300—1600 m above sea-level, according to Dr. BACKER, probably escaped from cultivation in the year 1907 from Mr. BUYSMAN's garden. There is no indication that this *Agrostis stolonifera* was an inhabitant of Java in earlier times, when ZOLLINGER collected in Java. The study of the type of STEUDEL may solve this problem and we have for

the moment to accept the names *Agrostis infirma* BUSE and *A. Reinwardtii* v. HALL. The former is only seen by me from Java, while the latter was collected by CLEMENS in British North Borneo.

These Bornean plants do not differ from the Javanese ones; they have the glabrous panicle-branches and larger spikelets of *A. Reinwardtii* v. HALL.

HITCHCOCK mentions *Agrostis Reinwardtii* v. HALL in his paper on Papuan grasses collected by L. J. BRASS (Brittonia Vol. 2, 1936, p. 117) as common in forest glades on Mount Albert Edward in the Central Division (BRASS 4203). I did not see this plant which should be compared with BUSE's type material.

KUNTH described and figured two species of *Arundo* in the same year, *Arundo madagascariensis* KUNTH which is *Donax Thouarii* P. B. from Madagascar and *Arundo Reynaudiana* KUNTH from Pegu. HOOKER did not accept these two species, when he based his new genus *Neyraudia* on the former making the combination *Neyraudia madagascariensis* (KUNTH) HOOK. F. The genus and the species were extensively described by him in the Flora of British India, Vol. VII (1897) p. 305. There was, however, an earlier name for the species *Donax Thouarii*, given by BEAUVOIS. Since I found that *Aristida arundinacea* L. was congeneric with *Neyraudia* HOOK. F., the species bears the name *Neyraudia arundinacea* (L.) HENR., as given in my monograph of *Aristida*.

BUSE described in the year 1854 an *Arundo Zollingeri* from Java which was accepted by HOOKER as a variety of his *N. madagascariensis*. At the same time HOOKER gave *Arundo Reynaudiana* KUNTH as a synonym of this variety *Zollingeri*. Recently *Arundo Reynaudiana* KUNTH was accepted by KENG as a distinct species and he made for it the new combination *Neyraudia Reynaudiana* (KUNTH) KENG. If we agree with HOOKER's opinion that both names of KUNTH belong to but one species, we have to accept HOOKER's variety *Zollingeri* for KENG's *Neyraudia Reynaudiana*; HOOKER's variety, when transferred to *Neyraudia arundinacea* (L.) HENR., retains its name, as the citation of an earlier synonym (*Reynaudiana*) has no influence on the choice of the name of the variety, according to art. 48 of the international rules of nomenclature. Hence the plant so common in Java must bear the name **Neyraudia arundinacea** (L.) HENR. var. **Zollingeri** (BUSE) HENR. nov. comb.

One of the most puzzling groups of grasses concerns *Paspalum scrobiculatum* L. as it is accepted in BACKER's "Handbook". The des-

cription there is a mixture of at least 5 minor groups which must be accepted as distinct species. It is rather easy to recognize the *Paspalum longifolium* ROXB. by its small, pubescent, commonly 4-ranked spikelets, its many racemes on an elongate axis and its long leaves.

Another distinct species is the very broad-leaved, robust *Paspalum auriculatum* PRESL. which occurs also in Africa and was sufficiently treated by STAPF in the Flora of Tropical Africa.

After the elimination of these two species, the remaining group is still a mixtum, but not so easy to disentangle. At first we must call attention to *Paspalum orbiculare* FORSTER, very shortly and insufficiently described in the year 1786 from the Society Islands. Not having seen the type of this species we are totally dependent on HITCHCOCK's treatment of this species in this Grasses of Hawaii (Mem. of Bishop Mus. VIII, No. 3, 1922, p. 179) where the species is more fully described and a plate is given. In the description the small, 2 mm long spikelets are characteristic. It is a pity that no figure of the spikelet is given by HITCHCOCK. Fortunately, I received a good specimen from him, collected by himself on the island of Oahu, from which I could recognize the species which is rather dispersed in the tropical Asiatic regions, although apparently much rarer than the wild form of *Paspalum scrobiculatum* L. In this specimen the small green spikelets are distinctly apiculate and not rounded at the summit, as is the case in *Paspalum scrobiculatum* L. and both glumes are 3-nerved. We are thus able to separate this species which occurs rather plentiful in the Lingga Archipelago. This very distinct species, as STAPF already indicated, was placed in FLUEGGE's Monograph (1810) under *Paspalum scrobiculatum* L., citing also WILLDENOW's description. From FLUEGGE's citations we do not know that he has seen an authentic specimen of FORSTER's species and FORSTER is not mentioned among the "Loci Natales" nor under the persons who communicated specimens to him. Therefore, it may be that FLUEGGE did not recognize the true *Paspalum orbiculare* FORST. as a distinct species. This is very probable, because FLUEGGE gave some "Observationes" after his description of *Paspalum scrobiculatum*. In Observatio IV (p. 93) he says "Clarissimus Willdenowius jam Paspalum orbiculare Forsteri singularem a Paspalo Kora diversam esse speciem censet: in quo equidem viro doctissimo non assentior, propterea quod nervorum in glumis calicinis numerus non magis quam pedicellorum natura in hac specie sibi constat. Variat haec planta omni parte mirum in modum, neque ullum fere exemplar alteri plane respondet, quod ex diversa loci natura enevire videtur."

Thus, although WILLDENOW recognized two species, FLUEGGE could not follow him and the reason is, in my opinion, that FLUEGGE did not recognize FORSTER's species which he identified as WILLDENOW's *Paspalum Kora* (which is most allied to the true *P. scrobiculatum*). He had probably a wrong specimen before him, and therefore described the true *Paspalum orbiculare* as a new species, when he received a specimen collected by FORSTER in New Caledonia and communicated to him by MEYER as *Paspalum undulatum,* under the name of *Paspalus Forsterianus* FLUEGGE. This new name is without doubt based on *Paspalum undulatum* SPRENGEL in Mantissa prima Fl. Halensis (1807) p. 30. E. nova Caledonia. Forst. He changed the name on account of the existing *Pasp. undulatum* POIRET (1804).

In his Observatio IV FLUEGGE added the following sentence: "Forsterus eam Paspali venusti nomine insignitam amicis mittebat, antequam descripserat." FLUEGGE mentioned for his *Pasp. Forsterianum* the "spiculae elliptico-lanceolatae, acutiusculae subtrifariam imbricatae", and the five-nerved glabrous glumes with the stramineous lemmata. In BALANSA's Herbarium I have seen specimens collected by him in New Caledonia with his note: "confer Pasp. Forsteriano Fluegge". This very good material agrees with HITCHCOCK's plants and has always 3-nerved glumes, in contradiction with FLUEGGE's statement.

For these reasons I accepted *Pasp. orbiculare* FORST. and *Pasp. Forsterianum* FLUEGGE as belonging to the same species, reasons which are, however, only based on the specimens at my disposal. In the group of the *Paspalum scrobiculatum* L. this *Paspalum orbiculare* FORST. is at once recognizable by the small, glabrous, acuminate, greenish, 3-nerved spikelets, which most agree with those of *Pasp. longifolium* ROXB. The remaining group after the elimination of this species has to bear a name and being much related to the type of *Paspalum scrobiculatum* L., many authors have assigned this name to it. Now, field studies have proved that specimens described by LINNÉ as *Paspalum scrobiculatum* do not occur in a wild state, and STAPF considers LINNÉ's plant as the cultivated form of the species *Paspalum scrobiculatum* in a broad sense. I think that it is better to accept these wild forms as a distinct species. It was already described by LAMARCK as *Paspalum Commersonii,* found by COMMERSON in Mauritius. I have seen an authentic specimen in BALANSA's fine collection labeled "Paspalum Commersonii (Ile de france) Commerson". STAPF accepts this species as a variety under *Paspalum scrobiculatum* L. in the Flora of Tropical Africa, with *Paspalum Kora* WILLD. as a synonym. As is already said by me, I prefer to take up this plant

as a distinct species under LAMARCK's name. Its spikelets are much smaller than those of the type of LINNÉ and much larger than those of *Paspalum orbiculare,* brownish at maturity with dark brown lemmata, they are rounded and obtuse at their summit and the glumes are 5—7-nerved. The type of LINNÉ's *Paspalum scrobiculatum* is accepted by STAPF under the varietal name *frumentaceum,* a name which goes back to *Paspalum frumentaceum* ROTTB. ex ROEM. et SCH., Syst. II, 296.

There is still another species in this group, the *Paspalum cartilagineum* PRESL. It is characteristic by its lemma of the lower floret being cartilaginous instead of membranous. It is considered by American authors as a distinct species, but by others as a variety of *Paspalum scrobiculatum* L., sometimes also regarded as a monstrosity. The material at hand proves, however, that the form and outline of the spikelets is quite different in other species of the group of *Pasp. scrobiculatum* L. They are never so rounded, distinctly obovate and slightly broader above the middle and they are about 2 mm long. Studied in connection with the other species of this group, this species suggests a closer affinity to *Paspalum orbiculare* FORST., where the spikelets are oval, broadest at the middle and distinctly apiculate. On account of the affinity of the two species SUMMERHAYES and HUBBARD, in their study on the grasses of the Fiji Islands, have united them, placing PRESL's species as a variety under *Paspalum orbiculare* FORST.. The quite different form of the spikelets and the striking differences in the nervation of the glumes, given by me above are, however, to be regarded as important, if we study the genus *Paspalum,* as it is treated by Mrs. A. CHASE. For quite the same reasons as in other difficult groups of *Paspalum* in North and South America it is better to keep them separate.

Going over the whole material at hand, a discrimination is not very difficult, although there are always a few specimens which do not fit exactly in one of the groups accepted. It may be that there occur hybrids here between so much related species, which not rarely grow together in many localities. All factors considered, it seems better to recognize the various groups as distinct species and on the whole specimens may be segregated with relatively few intermediates. In this matter I fully agree with Mrs. A. CHASE, who recently divided the puzzling complex *Axonopus compressus P. B.* into two distinct species.

HITCHCOCK, who had a great skill in pointing out various good characters for discrimination of many troublesome groups, has more recently given a new idea for the wild forms of *Paspalum scrobiculatum.* He put it forward in ALSTON's treatment of the species in the Supplement

to the Flora of Ceylon by TRIMEN. A key is given for the various species of *Paspalum* on p. 313. Besides the name *Paspalum scrobiculatum* L., restricted to the cultivated plant, we find there *Paspalum Commersonii* LAMK., *Paspalum longifolium* ROXB. and a new one named *P. Metzii* STEUDEL. *Paspalum longifolium* ROXB. is not characterized by the puberulous spikelets but by the spikelets in three or four rows, with numerous racemes and with a tuft a white hairs in their axils. We further learn from the description on p. 315 that the spikelets are glabrous. The two other species *P. Commersonii* and *P. Metzii* are distinguished by: styles white, racemes usually paired, inflorescence shortly pedunculate in *P. Metzii* and styles dark purple, racemes usually 3—4, inflorescences long pedunculate in *P. Commersonii.*

However, *Paspalum Metzii* STEUD. is described on p. 314 as having spikes 1—4, usually 2. It seems to me that it is not easy, even rather impossible, to divide a large material on such grounds. The number of racemes is variable even in the same plant and from other characters of the inflorescence the same can be said. The colour of the stigmas, white versus dark purple, important in fresh material, cannot be checked in the various old types, nor in the other dried material. ALSTON says that *Paspalum Metzii* STEUD. appears to be the wild form of *Paspalum scrobiculatum* rather than *P. Commersonii.* The identification of this species was given by HITCHCOCK. For the adoption of the name *Paspalum Metzii* STEUD. there ought to be found better and more practical characters to separate it from the older *Paspalum Commersonii* LAMK. after a more careful examination of the types in the future, tested with abundant exsiccatae and living material.

It is noteworthy that in ROXBURGH's description of *Paspalum longifolium* nothing is said about the pubescent spikelets which is in accordance with ALSTON's treatment; as this pubescence is sometimes rather scanty, it may be overlooked by ROXBURGH, at the other hand we may not pretend that glabrous spikelets do not exist in *Paspalum longifolium.*

Various types of ROXBURGH are only known from his drawings but we know that TRINIUS described species of ROXBURGH in 1826. In his Dissertatio botanica altera, *Paspalum longifolium* ROXB. is described from a Javanese specimen received by TRINIUS from NEES. TRINIUS mentions the many alternate racemes (10—20), the foliaceous axis, broader than the spikelets and the 4-ranked mucronate, pubescent spikelets, all characters agreeing with the material from Java which was rather abundantly seen by me.

Recently Mrs. AGNES CHASE, in her article on the Papuan grasses, collected by L. J. BRASS II (Journal of the Arnold Arboretum, Vol. XX, 1939, p. 309), has given a new name *Panicum cruciabile* to the plant commonly known as *Panicum caesium* NEES, which was based in 1850 on CUMING 652 from the Philippines. This name, *Panicum caesium*, was already much earlier applied by him to a quite different species of the genus *Echinochloa* and is therefore to be rejected. *Panicum cruciabile* CHASE is indicated by CHASE as found in Ceylon, Burma, the Philippines and New Guinea. She overlooked that the species, with such a large distribution, was described already by BALANSA in 1890 as *Panicum cambogiense*. This species was taken up but not studied by Miss A. CAMUS in her treatment of the grasses of Indo China, because the plants of BALANSA were not represented in the Paris Herbarium. BALANSA's types are, however, in his own herbarium, which after his death came in the possession of the Rijksherbarium and these plants in BALANSA's script are, of course, the actual types so far as they are described by BALANSA himself. BALANSA's species is a large coarse grass, with pubescent nodes and strongly tuberculate-hispid sheaths, quite as in the specimens mentioned by Mrs. CHASE and is an annual plant too. It is allied to *Panicum luzonense* PRESL, a smaller, annual species with smaller spikelets. BALANSA's description is short but valid and is supported by his good material. The species which is also, although rarely, observed in Java, has to bear BALANSA's specific name. The very long branches of the very large panicles are characteristic for the species. The true *Panicum luzonense* PRESL was in BALANSA's hands, but described by him as a new species *Panicum oryzetorum* (l.c. p. 141). All the much shorter branches of the panicle have about the same length and they are reiterately branched, hence the form and outline of the panicle in *P. luzonense* is entirely different from that of *Panicum cambogiense* and the two species, although much allied, may be recognized at first sight.

Another plant mentioned by BALANSA is his *Panicum Munroanum*. It was given as a substitute for MUNRO's variety β, spiculis glabris of *Panicum Helopus* TRINIUS, published by THWAITES in his well-known Enumeratio plantarum Zeylaniae (1864). We have here the case that in reality *Panicum Munroanum* BALANSA is not effectively described. But BALANSA gave various data and proposed to accept MUNRO's variety as a distinct species and his name is a substitute for MUNRO's variety and therefore a valid name. *Panicum Munroanum* belongs, however, to the genus *Acroceras* and being the same as MERRILL's *Panicum crassiapiculatum*, it has to bear the epithet of BALANSA and thus becomes **Acroceras**

Munroanum (BALANSA) HENR. nov. comb. All the specimens cited by BALANSA were studied by me.

Acroceras is a small genus with about 8 species, 4 of them are enumerated in the Flora of Tropical Africa and one of them, *Acroceras zizanioides* (H. B. K.) DANDY is widely distributed in the New World from Argentina and Paraguay to Brazil and Guiana, going northward to the West Indian Islands and Mexico. The material of the New World is rather uniform and always characterized by its totally glabrous nodes. The material seen from Tropical Africa (Congo, French Sahara and Kamerun) agrees perfectly with the material of the New World and belongs to the same *Acroceras zizanioides*. *Panicum zizanioides* H. B. K. is also mentioned by BACKER from Java. The Javanese material seen by me is, however, very distinct by its characteristically hairy nodes and the material seen from Soembawa and Banka is quite uniform as to this character. There are moreover many other differences in habit, leaf shape and in the spikelets. This Asiatic material represents a different species and in my opinion the true *Acroceras zizanioides* does not occur in our region. BACKER's description is excellent as he mentions the hairy nodes.

This Asiatic species of *Acroceras* was not overlooked by HACKEL, who named it *Panicum Ridleyi*, a name which is to be found in HOOKER's Flora of British India with the indication "name only". Indeed, in the Trans. Linn. Soc. Ser. 2, Bot. III p. 401, this name is mentioned as a nomen nudum. HACKEL distinguished the species, which was collected by RIDLEY near Pulau Besar in Malaya. STAPF, when he treated the genus in 1920 in the Flora of Tropical Africa (l.c. p. 623) copied the data from HOOKER and mentioned HACKEL's species as a nomen nudum too. STAPF overlooked however that the great agrostologist published his *Panicum Ridleyi* already in 1901 in SCHMIDT's Flora of Koh Chang, Part. III. This is a contribution to the knowledge of the vegetation in the Gulf of Siam and a preliminary Report on the botanical results of the Danish expedition to Siam (1899—1900). We find this publication in Botanisk Tidsskrift Vol. 24 (1901), where on p. 98, *Panicum Ridleyi* HACK. is more fully treated with a latin diagnosis, indicating the differences with *Panicum oryzoides* SW., which is HOOKER's *Panicum latifolium* but not that of LINNAEUS. On account of an earlier *Panicum oryzoides* ARDUINO, we have to accept for SWARTZ's name *oryzoides* the name *zizanioides*, given by the authors of the Nova Genera. HACKEL's description of *Panicum Ridleyi* perfectly applies to the Asiatic plants, hitherto confounded with the American species and the former ones have to bear HACKEL's name; we are inclined to accept for them the name *Acroceras Ridleyi* STAPF based on *Panicum Ridleyi* HACK.

The species, described by HOOKER as *Panicum latifolium* is as to the characters given by him, a mixture of HACKEL's species and another one, described by MERRILL as *Panicum crassiapiculatum*, a much more common species with a larger distribution, being known from Ceylon and British India, extending westward to Indo China and the Philippines. It occurs also in Java. We therefore have in our region two species of *Acroceras*; they differ not only in the characters of the spikelets but they are already recognizable in the vegetative parts.

The study of the various species of this small genus is hampered by the many contradictions found in the various treatments of the species in our manuals. Even HACKEL, when he diagnosed his *Panicum Ridleyi*, mentioned for the allied species a wrong character. He indicated that the lower glume is half as long as the spikelet in *P. oryzoides* SW. (our *zizanioides* of the New World). HITCHCOCK and CHASE described and figured *Panicum zizanioides* in their well-known work: "The North American Species of Panicum" in Contributions from the U. S. National Herb. Vol. XV (1910) p. 326. We find here a lower glume about two-thirds the length of the spikelet, quite in accordance with fig. 367 and with the large material I could verify. From HACKEL's description we may accept that *P. Ridleyi* has a lower glume $^2/_3$ or $^3/_4$ the length of the spikelet. This is also mentioned by RIDLEY (Flora of the Malay Peninsula, Vol. V, 1925, p. 230), but his description of *A. Ridleyi* and his plate agree with *A. Munroanum*. For *A. Ridleyi* he gives as the type "Pahang River". But HACKEL indicates as his type "Pulau Besar" which is according to him the same as a specimen from Koh Chang in Siam. This specimen from Pulau Besar is now placed by RIDLEY (or STAPF?) under a new species *Acroceras sparsum* STAPF ap. RIDLEY l. c. p. 229, which is a tall scandent (not dwarf and prostrate) grass with spreading panicles up to 14 in. long with up to 6 in. long distant scabrid branches, longer spikelets (ca 3 mm) and lower glume half as long as the spikelet. We do not learn what is the type of this *Acroceras sparsum* STAPF, given with so many localities, but according to RIDLEY it is his *Panicum oryzoides* RIDL. Mat. III, 138 (not of SW.). Nothing is said by RIDLEY about the fine character of the hairy nodes.

From all the data in RIDLEY's descriptions at hand we learn that the dwarf prostrate grass with 6 in. tall stems, lanceolate leaves 5 cm long and 6—7 mm wide, short, up to 5 cm long panicles with a few short, not spreading branches each with about 4 spikelets and with glume I more than half as long as III, is the same as *A. Munroanum*. This is also evident from fig. 223.

How to explain the differences between HACKEL's description and type with RIDLEY's description? This is rather clear from HACKEL's own statements. HACKEL, after having given a latin diagnosis, tells us that the species was established by him on specimens received from RIDLEY and collected by him near Pulau Besar in Malacca. HACKEL says that these specimens are identical with the plants collected near Koh Chang in Siam. These plants are certainly in HACKEL's own herbarium at Vienna. HACKEL further says, that afterwards RIDLEY communicated to him also specimens from Pekan, which he determined as forma minor of *Panicum Ridleyi*. HACKEL says of this Pekan plants: "I see at the moment however that they better belong to P. latifolium, they belong to the, in India diffused, form of this species, which is perhaps to split as a variety". This forma minor from Pekan is now placed by RIDLEY under *Acroceras Ridleyi* STAPF, although HACKEL exactly indicated that it is not his *Panicum Ridleyi*. The conclusions are therefore that RIDLEY communicated to HACKEL various plants of the genus *Acroceras,* but RIDLEY did not receive them back, but wrote HACKEL's names, communicated to him by letter, on the labels of the duplicates he had at hand. RIDLEY did not control HACKEL's statements of 1901, because he cited only HACKEL in Trans. Linn. Soc. p. 400, where the name is a nomen nudum. RIDLEY now gave HACKEL's names to the wrong specimens and these were sent to Kew, where STAPF without verifying HACKEL's statements of 1901 too, accepted the determinations as correct. STAPF gave the manuscript names *Acroceras sparsum* STAPF and *A. Ridleyi* STAPF; the latter is, properly speaking, based on the nomen nudum *Panicum Ridleyi* HACK. in the Transactions. STAPF nor RIDLEY were acquainted with HACKEL's description and treatment afterwards given in 1901 and therefore RIDLEY is responsible for the difficulties which have arisen if the two species mentioned in his flora are to be recognized. It is a fact that STAPF's *Acroceras Ridleyi* is based on a nomen nudum and not on the description which was unknown to STAPF. *A. Ridleyi* STAPF is therefore without any doubt a synonym of *Panicum crassiapiculatum* MERR. (our *Acroceras Munroanum*) and *Acroceras sparsum* STAPF ap. RIDLEY is HACKEL's true *Panicum Ridleyi* as described in 1901. Both names are in this case misleading. There are now two conclusions. *Acroceras Ridleyi* STAPF is based on a nomen nudum and described and figured in RIDLEY's Flora. The description and plate apply to an already described species. Hence *Acroceras Ridleyi* STAPF is a synonym.

Second conclusion: the true *Panicum Ridleyi* as described by HACKEL

himself in 1901 cannot bear the name *Acroceras Ridleyi* on account of the existing name by STAPF for a quite different species. Hence it has to bear another name. *Acroceras sparsum* STAPF may therefore be accepted for this species because the description points to the species which HACKEL published as *Panicum Ridleyi* in 1901. HACKEL's type is moreover mentioned by STAPF under the localities. In this description nothing is said about the hairy nodes of the true *Panicum Ridleyi,* but we find among RIDLEY's plants also Perak, Goping, a plant cited by HOOKER as var. *major* of his *Panicum latifolium.* This plant is mentioned by HOOKER as having a stout, 4—6 ft high stem, rigid internodes, tomentose nodes and leaves $^3/_4$ inch broad, margins thickened, base narrowed, panicle nearly 12 in. long: Malay Peninsula, at Goping, KING's collector. All these data agree perfectly with HACKEL's description of *Panicum Ridleyi.*

All these observations give us the following synonymy of the two Javanese species of *Acroceras.*

Acroceras Munroanum (BALANSA) HENR. = *Panicum Munroanum* BALANSA (1890) = *Acroceras crassiapiculatum* (MERR.) ALSTON (1931) = *Panicum crassiapiculatum* MERR. (1906) = *Acroceras Ridleyi* STAPF ap. RIDLEY (1925), non *Panicum Ridleyi* HACKEL (1901).

Acroceras sparsum STAPF ap. RIDLEY (1925) = *Panicum Ridleyi* HACKEL (1901) non *Acroceras Ridleyi* STAPF ap. RIDLEY (1925).

It is noteworthy that ALSTON in the Supplement of the Hand-book to the Flora of Ceylon by Trimen, Part. VI. (1931) p. 324, arrives at the same conclusions, as he placed *Acroceras Ridleyi* STAPF ap. RIDLEY as a synonym under his *Acroceras crassiapiculatum,* quoting RIDLEY's Fl. Mal. Pen. V. (1925) p. 229.

So we have here the curious fact that STAPF and RIDLEY, by applying a name to the wrong plants, overlooking a valid description and working only with a nomen nudum, are responsible for the elimination of a validly published species by HACKEL, the more so because at the same time they transferred the name to another genus. If STAPF and RIDLEY had published the combination in the Flora of Malaya, as it was given by HACKEL, the overlooked description of HACKEL, given earlier, had been valid, and this fact recognized we would have been able to make a valid combination under *Acroceras* with HACKEL's specific name. The discovery that both STAPF and RIDLEY were unacquainted with HACKEL's valid description and dealt only with an earlier nomen nudum, brought the nomenclature of the Javanese species in a quite

different position and gave rise to the disappearance of a valid name proposed by its author.

From the above-mentioned facts I wish not to pretend that the true *Acroceras zizanioides* (H. B. K.) DANDY does not occur on the Asiatic continent, although it is not yet found in one of the islands of the Malay Archipelago. In BALANSA's herbarium I saw this true *A. zizanioides* from Tonkin, where it was collected near Tu Phap, in 1887 (BALANSA no. 1643). This is very good material, perfectly agreeing with the American plants. The same species was also found in GRIFFITH's herbarium (distributed at the Royal Botanic Gardens, Kew (GRIFFITH no. 6517). Here the species was mixed with *Acroceras Munroanum*. This species therefore seems to be rather rare, as these two plants are the only ones seen from the Asiatic continent.

Miss CAMUS has confounded two species of *Acroceras* in the Flore générale de l'Indo-Chine (p. 423—424), as appears from her description, the synonymy and the cited material. We know at present how distinct *Acroceras Munroanum* and *A. zizanioides* are.

Recently the genus *Acroceras* was also collected in Borneo on Mount Kinabalu by CLEMENS (no. 29694) and distributed as *P. zizanioides* H. B. K. The material seen by me agrees, however, perfectly with other plants from Java, Sumatra and Soembawa and therefore belongs to *Acroceras sparsum* STAPF.

In the course of the investigations in this very interesting little genus of grasses there are two other species, which are noteworthy. There occurs in South America a very curious and striking grass, which was described as *Panicum paucispicatum* MORONG. It was already treated by me, when I studied the grasses from Bolivia in HERZOG's collection and HITCHCOCK and CHASE indicated it as closely related to *Panicum zizanioides* H. B. K. This *Panicum paucispicatum* is distinguished by the pubescent spikelets with a more pronounced crest to the fertile lemma. This easily recognizable species is here transferred to the genus *Acroceras* as **Acroceras paucispicatum** (MORONG) HENR. nov. comb., based on *Panicum paucispicatum* MORONG. This beautiful species was seen by me from Argentina (PARODI no. 8471); Bolivia (HERZOG no. 1524) and Paraguay (BALANSA no. 35, FIEBRIG no. 632). The species has finely pubescent nodes and very characteristic leaves, pectinately ciliate along the much thickened margins.

We have now dealt with seven species and the eighth one is a somewhat aberrant one. Being described by BALANSA as *Panicum tonkinense* it was placed by Miss CAMUS in a new genus *Neohusnotia* in the year

1920. *Acroceras* STAPF is from the same year, but has priority by several months. I had at my disposal the exceedingly good and rich complete material of BALANSA's *Panicum tonkinense* and although I agree with Miss CAMUS in accepting BALANSA's species, I must confess that already at first sight it proved to be a member of the genus *Acroceras*. Let us first of all compare the vegetative parts. A coarse grass with hairy nodes, broad lanceolate blades with much thickened margins, the rounded base with hairs on tubercles, long effuse panicles, with long distant spreading branches. All these characters agree perfectly with the material seen from Borneo, Java, Sumatra and Soembawa, cited by me above and accepted as *Acroceras sparsum* STAPF. Now we must verify the characters of the spikelets, upon which the genus *Neohusnotia* is differentiated. In form and outline these spikelets agree with those of *Acroceras*, especially with *A. zizanioides* and *A. sparsum*.

Miss CAMUS treated the differences between the genera *Acroceras* and *Neohusnotia* in her Key in the Flore générale de l'Indo-Chine (l. c. p. 211) as follows: Inflorescence formée d'épis souvent penchés, ni en panicule lâche, ni en panicule contractée en un seul épi: épillets ordinairement disposés sur un rachis dorsi-ventral. *Acroceras* is placed in this group next to *Paspalidium, Urochloa, Brachiaria, Echinochloa* etc. The other group is characterized by: Inflorescence en panicule lâche ou contractée en un seul épi cylindrique; rachis ordinairement non dorsi-ventral. *Neohusnotia* is placed in this group next to *Panicum, Sacciolepis, Cyrtococcum* and *Hemigymnia* (= *Ottochloa*).

From this discrimination it is evident that Miss CAMUS had an incorrect idea of the structure of the panicle in the genus *Acroceras*; its type being the American *Panicum zizanioides* H. B. K. It may be that American material was not studied by her and that she formed her ideas of the panicle in *Acroceras* from *Panicum Munroanum* or from *Panicum crassiapiculatum*, both cited by her. Moreover material of BALANSA and MERRILL was certainly at her disposal. We know that this *Panicum Munroanum* agrees rather well in the characters of the inflorescences with such genera as *Brachiaria, Urochloa* and *Paspalidium*, whereas *P. zizanioides* in its inflorescence is more deviating. It is, from all the facts hitherto known, absolutely impossible to find in CAMUS's key a single character to separate the genera *Acroceras* and *Neohusnotia*.

Let us now look at the various characters Miss CAMUS gave to both genera. *Acroceras* is characterized by her as follows: "Épillets à pointes courtes, obtuses, calleuses, comprimées latéralement", *Neohusnotia* as "glume 2 et glumelle 1 de la fl. inf. brièvement laineuses au sommet,

à appendice court, obtus, aplati latéralement, peu dur; gl. 1 très longue; glumelle 1 de la fl. inf. assez dure." Between these two distinctions there is not a single character that points to two different genera, the shortly hairy summits of gl. 2 and 3 are characteristic but still more hairy spikelets are present in the South American *Acroceras paucispicatum*. Both *Acroceras* and *Neohusnotia* have a very distinct laterally compressed crest of the fertile lemma, hence the name *Acroceras* of STAPF's genus. The only difference between the two genera is in my opinion that the sterile lemma (gl. III) is more cartilaginous in *Neohusnotia* and more papery in *Acroceras*. This, however, cannot be accepted as a generic character. A quite analogous case is *Paspalum cartilagineum* PRESL versus other allied species of *Paspalum*. Here the second glume and often also the sterile lemma have nearly the same texture as the fertile lemma. This case is quite parallel to *Neohusnotia*.

BALANSA's description of *Panicum tonkinense* agrees with his material, the types in his script being preserved in his own herbarium at the Rijksherbarium. Miss CAMUS's description of *Neohusnotia* is also very good, although there is some difference in the length of the lower glume, as is the case in other members of the genus *Acroceras*. After the study of BALANSA's rich material it was impossible to separate it from the genus *Acroceras* and therefore it is accepted as a member of that genus under the name of **Acroceras tonkinense** (BALANSA) HENR. nov. comb. based on *Panicum tonkinense* BALANSA.

After all the data given above it may appear that this *Acroceras tonkinense* is the same as *Acroceras sparsum* STAPF, at least as far as the material from Java, Sumatra, Borneo and Soembawa as seen by me is concerned. This material has spikelets also shortly pubescent upwards, the same more or less indurated sterile lemma, the same form of the spikelets, moreover the same pubescent nodes and the dark blades with the strongly thickened margins with their auriculate undulate base with its hyaline hairs. If indeed both species ought to be united, the name *Acroceras tonkinense*, having priority, is to be accepted for the Javanese species. RIDLEY's description of *Acroceras sparsum* is very insufficient, as nothing is said about the nodes and the various characters of the spikelets. Material from Malaya was not available and we must therefore wait until this can be studied more in detail so as to disentangle the case.

Miss CAMUS noted that her new genus was intermediate between *Lasiacis* and *Acroceras*. The former is a distinct American genus with a curious woolly tuft at the summit of the fertile lemma, moreover with

a bamboo-like habit. The vegetative parts of the genus *Neohusnotia*, however, are quite the same as in the genus *Acroceras*.

In the New World there occurs a species of *Oryzopsis*, which was described as *Oryzopsis Seleri* PILGER from Guatamala and which is allied to the North American *Oryzopsis fimbriata*. Both belong, as to the important character of the rigid palea with two much approximate keels and a narrow sulcus between them, to the genus *Piptochaetium*. *Oryzopsis fimbriata* was already transferred to it by HITCHCOCK. The other species mentioned, has to bear the combination **Piptochaetium Seleri** (PILGER) HENR. nov. comb., based on *Oryzopsis Seleri* PILGER.

In HACKEL's famous monograph of the *Andropogoneae* the great agrostologist accepted for a large genus the name of *Pollinia* TRINIUS, although he was acquainted with the fact that there was an earlier name *Pollinia* by SPRENGEL, which belongs to the genus *Andropogon*. According to our present rules of nomenclature the genus *Pollinia* TRINIUS is to be considered as invalid and now substituted by KUNTH's name *Eulalia* from 1829. It was OTTO KUNTZE who already transferred a great many species of HACKEL's genus *Pollinia* to *Eulalia*. HACKEL had in his work two large subgenera; for the first one he accepted *Eulalia* of KUNTH and for the other one the name *Leptatherum* NEES, described in 1841 as a genus in Proc. Linn. Soc. I. p. 92, with *Leptatherum Royleanum* NEES as the only species. Such a generic description, including the description of the only species mentioned, is, as we know, valid according to the rules of nomenclature. The same genus was described as *Microstegium* NEES ap. STEUDEL in his Synopsis (1854), moreover also as *Nemastachys* STEUDEL in the same Synopsis, earlier on p. 357 from Taiti. Without further investigations, one is inclined to accept the name *Leptatherum* NEES as being the earliest one, if we study only the data given in HACKEL's monograph. ROBIJNS used this name for the only species which occurs in the region of the Belgian Congo; cf. Flore Agrostologique du Congo Belge I (1929) p. 88—89, where *Eulalia* and *Leptatherum* are diagnosed. It appeared, however, that the genus *Microstegium* was already described in 1836, but it was incorrectly cited in the Kew Index and recently also by HITCHCOCK in his grasses of Canton and vicinity (Lingnan Science Journal Vol. 7, March 1931, p. 234).

The citation in both is *Microstegium* NEES ap. LINDLEY Intr. Bot. ed. 2. 1836. Such a second edition does not seem to exist. There is, however, a book of LINDLEY entitled: A natural system of Botany or a

systematic view of the whole vegetabile Kingdom (1836). This is certainly the book HITCHCOCK meant, *Microstegium* NEES was described there as a genus with *M. Willdenovianus* NEES as the type (Nepal in Herb. WILLD.). This is the correct date of the genus *Microstegium,* and the earliest one. Miss CAMUS accepted this name, making in the "Flore générale de l'Indo-Chine" various new combinations for the species represented within that region. The tendency to establish smaller genera, which are sharper limited, is a method, more and more accepted in modern times; accepting this method we have, however, to take the priority into account. Thus the only species from the Congo is **Microstegium Bequaerti** (DE WILLDEM.) HENR. nov. comb., based on *Pollinia* or *Eulalia Bequaerti* DE WILLDEM., only known from Katanga.

Both genera *Eulalia* and *Microstegium* are found in Java. *Eulalia* is represented there by 4 species, *Eulalia contorta* (BRONGN.) O. K., *Eulalia quadrinervis* (HACK.) O. K., *Eulalia fimbriata* (HACK.) O. K. and *Eulalia argentea* BRONGN., which was described in 1830. The synonymy of the latter is somewhat entangled and there is an earlier valid name for the species. ROXBURGH described the same species in 1820 as *Andropogon tristachyus,* an invalid name because there was already an *Andropogon tristachyus* H. B. K. from 1816. SCHULTES recognized this and renamed ROXBURGH's species into *Andropogon trispicatus* in Mantissa II (1824) p. 452. Hence the valid name for this species becomes **Eulalia trispicata** (SCHULTES) HENR. nov. comb.

A species of *Pollinia,* found in New Guinea, belongs to the genus *Eulalia,* its name is **Eulalia leptostachys** (PILGER) HENR. nov. comb. based on *Pollinia leptostachys* PILGER in ENGLER, Bot. Jahrb. Bd. 52 (1914) p. 170.

Let us now pass to the genus *Microstegium.* For Java we have at first **Microstegium dispar** (STEUD.) HENR. nov. comb., which is based on *Pollinia dispar* STEUDEL. *Pollinia geminata* MERR. is the same species. Another species is **Microstegium nudum** (TRIN.) CAMUS. BACKER described from Java a *Pollinia clavigera,* for which I propose the combination **Microstegium clavigerum** (BACK.) HENR. nov. comb.

Various species, treated in HACKEL's monograph, were united by BACKER in his "Handboek" under the name of *Pollinia ciliata* TRINIUS (sensu valde ampliato). I wish to accept this name only for the species as it was accepted by its author, in which case it must bear the combination *Microstegium ciliatum* (TRIN.) CAMUS, which is based on *Pollinia ciliata* TRINIUS from 1833. It is very probable that this species is the same as *Andropogon fasciculatum* L., Sp. Pl. ed. 1, p. 1047, for which the combination **Microstegium fasciculatum** (L.) HENR. is to be given.

We know that THELLUNG accepted *Andropogon fasciculatum* L. as a *Chloris* and based upon this name his *Chloris fasciculata* (L.) THELL., a name, invalid on account of the existing *Chloris fasciculata* SCHRAD. in SCHULTES Mantissa II (1824) p. 339, which is *Chloris distichophylla* LAGASCA (1816); cf. THELLUNG's article in FEDDE, Repertorium X (1912) p. 289. HITCHCOCK pointed already to the incorrectness of THELLUNG's combination, but also to the fact that the species described by LINNAEUS, certainly did not belong to the genus *Chloris*. LINNAEUS gave a description of his own and two references. The second reference from SLOANE is followed by a question-mark, showing that it was a doubtful synonym. It is certainly not the basis of LINNÉ's name, therefore it has to be eliminated. The first reference to MORISON refers to a plant from India with villous spikes and has to be eliminated too, because LINNÉ's description expressly states that the spikes are glabrous. Hence we have only to do with LINNÉ's own description in connection with his type specimen.

MUNRO stated that there are two specimens marked *Andropogon fasciculatum* L. in the Linnaean herbarium. One is *Eleusine indica* (L.) GAERTN., described by LINNÉ himself and the other is *Pollinia ciliata* TRIN. To the latter, LINNÉ's description points with certainty, even the "flosculis utrinque aristatis"; *Pollinia ciliata* has awns 2—5 times longer than the spikelets, a shortly ciliate axis of the racemes and glabrous spikelets, pectinately ciliate only along the keels of the lower glume. LINNÉ's description therefore, perfectly agreeing with the specimen in his herbarium, is to be accepted as valid and to be applied to the specimen of *Pollinia*. I therefore accepted this combination under *Microstegium*. We know from HACKEL's monograph that this author pointed out this question quite sufficiently in his work on p. 177 under *Pollinia ciliata* TRIN. and we quite agree with HITCHCOCK's treatment of this question in FEDDE, Rep. X (1912) p. 461.

At the same time I accept as distinct, some other species, notwithstanding BACKER's statement that they are not separatable by sharp characters and that they are connected, as he says, by many intermediate forms. The intermediate forms (accepted that they occur in reality) do not invalidate the standing of various allied species. In the modern school of taxonomy, under the influence of British systematic botanists, we feel more and more inclined to limit the species more sharply and small characters, not always at once to understand, are often of great importance for the identification and the delimitation of allied species. I therefore do not agree with BACKER's opinion to accept his *Pollinia ciliata* in such an amplified sense as is given in his Handboek.

I accept the following species:

Microstegium eucnemis (NEES) HENR. nov. comb. based on *Pollinia eucnemis* NEES ap. STEUDEL.

Microstegium Stapfii (HOOK. F.) HENR. nov. comb. based on *Pollinia Stapfii* HOOK. F. (1897).

Microstegium rufispicum (STEUD.) HENR. nov. comb. based on *Andropogon rufispica* STEUD. in ZOLL., Syst. Verz. p. 59. nom. nud. Synops. p. 379. (descriptio). Endemic in Java.

Microstegium vagans (NEES) HENR. nov. comb. based on *Pollinia vagans* NEES ap. STEUDEL Synops. p. 410.

Another species was collected in Java by JUNGHUHN and described by STEUDEL as *Pollinia montana* in 1854. HACKEL described it as *Pollinia grata* and this name was transferred to *Microstegium gratum* (HACK.) CAMUS. Being a plant from Java it has to bear its earlier epithet and becomes **Microstegium montanum** (NEES) HENR. nov. comb. based on *Pollinia montana* NEES ap. STEUDEL.

Microstegium delicatulum (HOOK. F.) HENR. nov. comb., based on *Pollinia delicatula* HOOK. F. (1897).

For *Polytrias*, a monotypic genus (spiculis ternatis, racemis solitariis) the name of the only species is given in the Index Kewensis as *Pollinia praemorsa* NEES ex STEUDEL Synops. p. 409. BUSE's name *Andropogon amaurus* given in the same year has priority, being already published in Febr. 1854. Hence OTTO KUNTZE named the species *Polytrias amaura* (BUSE) O. K.. Under this name the species occurs in BACKER's "Handbook". HACKEL named the species *Polytrias praemorsa* (NEES) HACK. and based his species on NEES's name found in STEUDEL's Synopsis. But NEES described his *Pollinia praemorsa* already in 1850 in an article: Gramineae Herbarii Lindleyani, published in HOOKER's Journal of Botany and Kew Garden Miscellany Vol. II, p. 98. NEES's name given in the year 1850 has thus priority above all other names hitherto known for this species and HACKEL's combination is therefore the valid one. Recently STAPF placed this species in the genus *Eulalia* as *Eulalia praemorsa* (NEES) STAPF ap. Ridley Fl. Mal. Penins. *Andropogon diversiflorus* STEUDEL ap. ZOLLINGER Syst. Verz. p. 58 is a nomen nudum, this name was afterwards validly published by STEUDEL in 1854 in his Synopsis. STEUDEL did not see NEES's *Pollinia praemorsa* also taken up by him in 1854 p. 409. On p. 370 of the same Synopsis STEUDEL described the same species under two different names *A. firmandus* and *A. diversiflorus*.

Another genus from the Javanese flora was formerly taken up by NASH as *Amphilopsis*, but has to bear the earlier name of *Bothriochloa* O. K. Besides *Bothriochloa pertusa* (L.) CAMUS and the so-called *Bothriochloa intermedia* (R. BR.) CAMUS there occurs in Java an endemic species described by BACKER as *Andropogon modestus*. For this species the name **Bothriochloa modesta** (BACK.) BACK. et HENR. nov. comb. is proposed.

As to the species *Bothriochloa intermedia* (R. BR.) CAMUS, given by BACKER in his "Handboek" as *Andropogon intermedius* R. BR., I have some objections against the name of this grass. ROBERT BROWN described his *Andropogon intermedius* from Australia. This true *A. intermedius* is a much coarser grass with spikelets 4 mm long, always unpitted glumes and an inflorescence with a short main axis, the lower racemes much exceeding it in length, so that the form of the inflorescence more resembles that of the *Bothriochloa pertusa* (L.) CAMUS, the well-known *Andropogon pertusus* (L.) WILLD. In the Javanese plants, commonly called *Andropogon intermedius*, there is a long main axis to the inflorescence, not rarely up to 20 cm long, the great number of racemes are shorter and the lower ones never overtop the axis. The spikelets are only 3—3½ mm long and pitted or unpitted. These characters correspond to a species, different from the true *Andropogon intermedius* R. BR.; they agree, however, with the characters of *Andropogon glaber* ROXB. (1820) as figured by TRINIUS in his Icones, t. 328 sub *Andropogon punctatus* TRIN. non ROXB. The correct name for the Javanese grass is therefore **Bothriochloa glabra** (ROXB.) CAMUS. In ROXBURGH's species the sessile spikelets are pitted, at the same time the pedicelled spikelets may be unpitted or pitted too. The status with unpitted sessile spikelets was described by PRESL as *Andropogon Haenkei*, but it has lower glumes often slightly depressed at the middle but not with a distinct nectariferous pit. This species of PRESL may be accepted as **Bothriochloa glabra** (ROXB.) CAMUS subsp. **Haenkei** (PRESL) HENR. nov. comb.

In the Caucasus there occurs an allied species of *Bothriochloa* with always unpitted sessile spikelets and a much shorter glume III (half as long only as I). It is accepted as **Bothriochloa caucasica** (TRIN.) HENR. nov. comb. based on *Andropogon caucasicus* TRIN.

Other species of this genus are:

Bothriochloa compressa (HOOK. F.) HENR. nov. comb. based on *Andropogon compressus* HOOK. F.

Bothriochloa Kuntzeana (HACK.) HENR. nov. comb. based on *Andropogon Kuntzeanus* HACK.

Bothriochloa ensiformis (HOOK. F.) HENR. nov. comb. based on *Andropogon ensiformis* HOOK. F.

Bothriochloa concanensis (HOOK. F.) HENR. nov. comb. based on *Andropogon concanensis* HOOK. F.

Bothriochloa Ischaemum (L.) HENR. nov. comb. based on *Andropogon Ischaemum* L.

Bothriochloa Foulkesii (HOOK. F.) HENR. nov. comb., based on *Andropogon Foulkesii* HOOK. F.

Bothriochloa pseudischaemum (NEES) HENR., nov. comb., based on *Andropogon pseudischaemum* NEES ap. STEUD. Synops. p. 380.

Easily recognizable as the genus *Capillipedium* STAPF is, so difficult it is to limit the various species of this genus. Rather common in Java is *Capillipedium parviflorum* (R. BR.) STAPF based on *Holcus parviflorus* R. BR. from Australia. This species has hairy nodes but glabrous internodes and occurs in two different forms, one of which may be accepted as the typical *Capillipedium parviflorum*. It has long branches to the effuse panicle, each branch with 3—5 spikelets, mostly a single triad of spikelets, consisting of one sessile and two pedicelled spikelets or with an accompanying group of 2 spikelets below it. In this plant the branches and branchlets are very slender and pilose in the axils, but otherwise glabrous. STEUDEL described an *Andropogon cinctus* in 1854. This is a *Capillipedium*, accepted by BENTHAM and by HACKEL as belonging to the species we are treating here. BENTHAM named it *Chrysopogon parviflorus* var. *spicigerus* in the Flora Australiensis VII (1878) p. 538 and HACKEL named it *Andropogon micranthus spicigerus* (BENTH.) HACK. in the monograph (1889) p. 489. This is a form, differing in having racemes with more than 5 spikelets, mostly there are 3 to 6 pairs, so that the aspect of the panicle is more dense. The internodes of the rhachis are here like the pedicels, ciliate, not glabrous as in the typical plant. I accept this subspecies as **Capillipedium parviflorum** (R. BR.) STAPF subsp. **capilliflorum** (STEUD.) HENR. based on *Andropogon capilliflorus* STEUD. Synops. (1854) p. 397.

This plant was already mentioned by ZOLLINGER as *Andropogon capilliflorus* STEUD. Herb. Zoll. 564; in arenosis M. Tengger 7500′ XI, in his Systematisches Verzeichniss Heft 1 (1854), p. 58. It is, however, a nomen nudum. The first description was by STEUDEL in his Synopsis, the beautiful types from Japan in SIEBOLD's collection are at the Rijksherbarium. Years ago they were at his request submitted to Dr. STAPF, who determined them as *Capillipedium parviflorum capilliflorum*.

HITCHCOCK in his "Grasses of Canton and Vicinity", placed this plant under *Andropogon micranthus spicigerus* (BENTH.) HACK. citing HACK. Monogr. (1889), p. 489. This is therefore not another rank of this form and accepting it as a subspecies I could give it its earlier name *capilliflorum*.

Another interesting *Capillipedium* is *Andropogon Hugelii* HACK. STAPF has transferred it in his treatment of the genus *Capillipedium*, in HOOKER's Icones 1922. I noticed, however, that the combination was already given by Miss CAMUS in "Les Andropogonées odorantes des régions tropicales". This study appeared in Revue de Bot. appl. et d'Agricult. col. Vol. I, No. 4 and was issued on 30 December, 1921. The combination was cited on p. 306 as *C. Hugelii* (*Androp. Hugelii* HACK.) d'Asie. Hence the correct name of this plant is **Capillipedium Hugelii** (HACK.) CAMUS.

I noted formerly in the collections at my disposal a very curious and much deviating species of *Capillipedium* from Timor, collected by FORBES. The same species occurs also in Java. It is a much more robust and coarse plant with very characteristic internodes. All the internodes bear a very hirsute coat, consisting of long irregular hairs like a wig. The internodes of the genus *Capillipedium* may be in some cases quite glabrous or have sometimes below the nodes only, a short appressed, rather scanty pubescence, but here the internodes are densely clothed all over, so that I give this species the name of

Capillipedium arachnoideum HENR. nov. spec. Perenne, caespitosum, stricte erectum. Culmi robusti, simplices, multinodes, elati, plus quam 1 m alti, basi squamis villosis praediti, inferne ad 3 mm crassi, teretes, nodis dense lanato- vel stellato-barbatis, internodia omnia longe crispe villosa; vaginae arctae, subcompressae vel leviter carinatae, praesertim intus rubentes, internodiis breviores, multisulcatae, inter sulcis coloratis pilis longis patentibus, basi tuberculatis praeditae, ad margines praesertim ciliatae; laminae anguste lineares, ad 5 mm latae, valde elongatae, sensim angustatae et apice longe setaceo-acuminatae, nervis prominentibus, nervo medio valido, albo, valde prominulo; ligula abbreviata, ciliata, auriculae lanosae; panicula ad 20 cm longa, subcontracta, 2—3 cm lata, haud densa, basi vagina inclusa, axis communis teres, puberulus et pilis longis crebris praeditus; rami verticillati, in axillis pilosi, inaequilongi, subramosi vel simplices, teretes, capillares, glaberrimi, ramulis brevissimis, 3-spiculatis, spiculis subimbricatis, pedicellis apice patellatis; spicula sessilis hermaphrodita, spiculae pedicellatae masculinae vel neutrae, duae, pedicelli applanati, dorso sulco longitudinali profundo exarati, in sulco membranacei diaphani, vix 2½ mm longi, marginibus haud ciliatis, laevi-

bus; spicula hermaphrodita 3½ mm longa, callo breviter barbato, viridula vel rubella, dorso plana, toto breviter sparse puberula, gluma Ima ad carinas leviter ciliolata, apice angustata sed truncatula, IIda primam aequans, IVa aristata, arista perfecta, 16 mm longa, columna brunnea hirtula, subulam flavam aequante; spiculae pedicellatae sessiles aequantes, magis acuminatae haud truncatae, vix ciliatae, haud aristatae.

Java: Residentia Banjoewangi. Idjèn, Sading, prope Asem Bagoes, alt. 100 m 2. III. 1922 leg. V. M. A. BEGUIN no. 184. Typus speciei in Herb. Lugd. Bat. sub no. 924. 11—680.

To this species belongs also a plant collected by H. O. FORBES (1882—1883) in Timor (no. 3463). Herb. Lugd. Bat. sub no. 908.83—1284. It is a somewhat less coarse plant with slightly smaller spikelets but agrees otherwise perfectly with the beautiful type specimen. In the genus *Capillipedium* this very characteristic species with its very striking indumentum of the internodes, is most allied as to the floral characters, to *Capillipedium parviflorum* (R. BR.) STAPF and has the same triads of spikelets as in the typical form of the latter.

The same species occurs also in the Philippines; the specimens at hand were issued by the Bureau of Science as *Andropogon micranthus* KTH., but the number 40508 is not mentioned in MERRILL's "An enumeration of Philippine flowering plants", Vol. I (1925). This number agrees with the new species, described above, in the villous internodes of the culms and in the form of the panicle, but it is a considerably less robust plant, with the habit of *Capillipedium parviflorum*, it is moreover distinguished by triads of spikelets with a second pair below them, the racemes have thus commonly two hermaphrodite spikelets and hence consist of 5 spikelets. There are, however, in the panicles also triads as found in the typical *C. parviflorum*. This form of the new species is quite analogous to the one observed in *C. parviflorum* and mentioned by me already as subsp. *capilliflorum*, and proves that plants with more than three spikelets per raceme, cannot be accepted as a distinct species.

MERRILL mentions *Andropogon micranthus* KUNTH var. *spicigerus* BENTH. in his enumeration (l. c. p. 43) as *Andropogon cinctus* STEUD. and observes that he believes this to be specifically distinct from *Andropogon micranthus* KUNTH. The differences in the number of spikelets per raceme are, however, not constant and both forms are not rare in the same panicle. The above mentioned plant Bureau of Science (no. 40508) is therefore accepted as a subspecies as follows:

Capillipedium arachnoideum HENR. subsp. **luzoniense** HENR. nov. subsp. Differt a typo praesertim statura minus robusta, culmis tenui-

oribus adpresse villosissimis, spiculis haud raro in eadem panicula ternatis vel quinatis et tunc spiculis hermaphroditis aristatis duabus praeditis.

Ins. Philippin. Sub-provincia Luzon. Insula Benguet, Mancayan to Baguio; leg. M. RAMOS et G. EDANO in Oct. 1921. Bureau of Science no. 40508. Typus in Herb. Lugd. Bat. sub no. 923.284—576.

When STAPF in 1922 treated the genus *Capillipedium* in HOOKER's Icones (Tabula 3085), he not only described extensively *Andropogon glaucopsis* STEUDEL as *Capillipedium glaucopsis* (STEUD.) STAPF, but he gave at the same time very valuable information on the synonymy of the other species. We know that HACKEL distinguished besides his *A. Hugelii* only 2 species, *A. micranthus* (now *C. parviflorum*) and *A. montanus* ROXB. The latter does not belong however to the genus *Capillipedium* according to HOOKER, who examined ROXBURGH's drawings and the *Andropogon montanus* as described by HACKEL has to bear another name. HOOKER therefore accepted the name *Andropogon assimilis* STEUDEL, mentioned by ZOLLINGER in Syst. Verz. p. 58 as a nomen nudum (Zoll. no. 859 from Bandoeng) but described in the same year by STEUDEL in his Synopsis, although HOOKER did not see the type or other Javanese specimens and accepted the correctness of HACKEL's identification of the Indian plant with it. But STEUDEL described at least three species of this group, *Andropogon assimilis* STEUD. Syn. p. 397, *Andropogon glaucopsis* STEUDEL p. 397 and *Andropogon subrepens* STEUDEL p. 397. The first one is not accepted by STAPF who gave as a synonym, *Andropogon assimilis* HOOK. F. Fl. Brit. India Vol. VII. p. 179 v i x STEUDEL.

Miss CAMUS however, had already in March 1922 made two combinations in the genus *Capillipedium*. One is *Capillipedium cinctum* (STEUD.) CAMUS based on *Andropogon cinctus* STEUDEL, the other is *Capillipedium assimile* (STEUD.) CAMUS based on *Andropogon assimilis* STEUDEL. The first combination accepted by CAMUS belongs certainly to *Capillipedium parviflorum* (R. BR.) STAPF. The other, however, is the species HACKEL described as *Andropogon montanus*. We have here therefore a contradiction between the opinions of STAPF and Miss CAMUS.

STAPF mentioned Java for his *Capillipedium glaucopsis* and Miss CAMUS too. STAPF says that it is locally abundant, often imitating small bamboos.

BLATTER treated this group also in his Revision of the Flora of the Bombay Presidency Part III Gramineae, in Journal of the Bombay Nat. Hist. Soc. Vol. XXXII, No. 3 (1928) p. 420. He treated three species but overlooked STAPF's combinations in 1922 and that of CAMUS in 1921.

He gave a description of the genus and a key for the three species *C. assimile, Hugelii* and *filiculme.* After the elimination of *C. filiculme* (stems decumbent and interlaced, very weak, filiform) he treated the two others with stems more or less suffrutescent below, stiff, erect. To distinguish the two remaining species he says that *C. assimile* CAMUS has the nodes of the stem glabrous; callus shortly bearded, whereas *C. Hugelii* has the nodes of the stem bearded; callus densely villous. BLATTER could give these differences because the true *Capillipedium parviflorum* (with hairy nodes) does nor occur in the region he treated. *Capillipedium Hugelii* has distinctly bearded nodes (of which I could convince myself), it agrees perfectly with the description of HACKEL and in the spikelet characters with a fragment of the type, formerly received from this mentor. Material seen from localities in the Bombay Presidency and adjacent regions has often glabrous nodes and material from Sumatra exactly matches it. The same species with its bamboo-like habit occurs in Timor (leg. FORBES) so that I am convinced that this species occurs in Java too. STAPF mentioned in his *Capillipedium glaucopsis* that the sheaths are "glabrae vel ad nodos et ad ora barbatae" and delineates a plant with hairy nodes. CAMUS says of her *Capillipedium assimile* "noeuds pubescents". HOOKER says "nodes more or less bearded."

From the data, compared with the material at hand, it is absolutely impossible to recognize the various species in a genus like *Capillipedium* only from the floral characters, because these are in all the species of the same scheme, and by looking only to these characters it is evident that in local floras one could not always distinguish the various species and preferred to accept only one, in a rather broad sense. But here we have, as in so many rather uniform genera, to attribute much importance to the various vegetative characters. Good and complete material is therefore always well to determine, poor specimens or fragments scarcely so. HOOKER said already that it is very difficult to distinguish *A. micranthus* (*parviflorus*) from small forms of *A. assimilis. Capillipedium filiculme* (HOOK. F.) STAPF is in this genus, so far as known, the only annual species, although I could not verify this. I wish to treat here the three species described by STEUDEL, already mentioned above, viz. *Andropogon glaucopsis, Andropogon subrepens* and *Andropogon assimilis,* they are numbered consecutively. The first and the second one are based on plants of WALLICH, *A. assimilis* on ZOLLINGER 859 from Java. As the names in ZOLLINGER's Verzeichniss are nomina nuda, we have only to discuss the 3 species in STEUDEL's Synopsis. *A. glaucopsis*

is based on WALLICH Cat. 8786 and 8787 from Nepal. STEUDEL mentioned the nodes as "villoso-barbatis" which perfectly agrees with WALLICH 8786, seen by me, the other number was not studied. *Andropogon subrepens* based on WALLICH Cat. no. 8789 and *Andropogon assimilis* have glabrous nodes. BLATTER in his key, mentioning *Capillipedium assimile* CAMUS as having glabrous nodes had therefore the true *Andropogon assimilis* before him. Other authors who treated the various species of STEUDEL as a single one mentioned the nodes as hairy or glabrous.

We have now to make the following conclusion. Besides the various species of *Capillipedium* as given by HOOKER and by STAPF there is a perennial species, which in its vegetative characters is very striking and different from all the other ones. Its habit was accurately characterized by HACKEL as follows: "Culmi inferne decumbentes radicantesque a basi ramosi vel ramosissimi, ramis a culmo patentibus; vaginae inferiores a culmo solutae, distantes. Paniculae rami ramulique in axillis longiuscule (etsi interdum parce) barbati." For this species we are inclined to accept the name *Capillipedium glaucopsis* (STEUD.) STAPF as the earlier one, based on *Andropogon glaucopsis* STEUD.. STAPF's description agrees with STEUDEL's description as to the nodes. I am sorry to say that *Andropogon glaucopsis* and *A. assimilis* cannot be maintained as two species, differences other than the hairy or glabrous nodes could not be sharply fixed, as abundant material was not at hand. In the future field studies and a large collection from various parts of its area will help us to solve this problem. Very good material from Sumatra with glabrous nodes is certainly *Capillipedium assimile* CAMUS and I regret that I could not study ZOLLINGER's no. 859 from Java. In my opinion the species, although not mentioned in BACKER's "Handboek", occurs certainly in Java because such eminent agrostologists as HACKEL and STAPF mentioned it so emphatically.

But there are many pitfalls on the paths of nomenclature. The combination based by STAPF on *Andropogon glaucopsis* in STEUDEL's Synopsis is invalid, because there exists an overlooked earlier *Andropogon glaucopsis* by STEUDEL in 1840, based on *Andropogon macrourus* var. *glaucopsis* ELLIOTT and published in 1816. This earlier name applies to a quite different North American grass. The epithet *glaucopsis* can therefore never be used when we accept the three species of STEUDEL as but one more or less variable species. There are no important differences between the two remaining species of STEUDEL, viz. *A. subrepens* and *A. assimilis*, both have glabrous nodes. I therefore propose to call

the species, formerly named *Andropogon montanus* HACK., **Capillipedium subrepens** (STEUD.) HENR. nov. comb. because STEUDEL's *A. subrepens* has priority over *A. assimilis*. STAPF's *C. glaucopsis* with hairy nodes must receive a new name. I propose **C. subrepens** var. **glaucophyllum** HENR. nom. nov. for *Andropogon glaucopsis* STEUD. (1855) non STEUD. (1840).

A very polymorphous group of grasses is represented by the difficult genus *Isachne*. Very distinct as a genus, its members are, however, often confounded and a renewed study of the various types in connection with abundant material is the only way to solve the difficulties. A monographical study of this interesting genus is highly necessary for its further study. For the present I wish only to clear up some points, interesting for a study of the Javanese members of this genus.

In the first place we have *Isachne globosa* (THUNB.) O. K., a well-known species, although its characters are still insufficiently known. This species was described by STEUDEL in 1846 in Flora as *Panicum* (*Isachne*) *lepidotum* from a specimen collected by GOERING. This type is in STEUDEL's own herbarium. Afterwards, during his visit to Leiden, STEUDEL studied the famous collection of Japanese grasses in SIEBOLD's herbarium and saw the same plants there. Among SIEBOLD's plants there are two sheets in STEUDEL's script with his specific name *lepidotum*. Both sheets bear also the name *Milium globosum* THUNB., given by SIEBOLD. STEUDEL's label reads: "*Panicum* (*Isachne*) *lepidotum Steudel. An Milium globosum Thunb.? sed pedunculi infra apicem cingulo luteo notati, vix possunt observavi.*" STEUDEL therefore observed the curious nectariferous spots which are found on the pedicels of the spikelets. These spots are yellowish, oblong inspissations at about half the length of the pedicels, they are not represented if the spikelets are sessile but mostly very distinct in the longer pedicelled ones. These spots are very striking by the contrast with the dark pedicels and are quite analogous with the spots found below the spikelets in various members of *Eragrostis*; in many cases the pedicels seem to be articulated. THUNBERG described his *Milium globosum* as having "*pedicellis cingulo luteo*". So far as is known to me this character was never mentioned in the recent literature as represented in *Isachne* and STEUDEL was the only one who saw it. STEUDEL, however, did not publish this observation. In his description from the year 1846, he says "*nodis sublepidoto-adspersis*, etc., *glumis 7-nerviis, ovatis obtusissimis, paleis flosculi coriaceis glabris, interiore flosculo foemineo vel neutro sterili*". STEUDEL says further that the

species is most nearly allied to *Panicum Isachne australe* R. Br.. A second sheet bears also Steudel's determination in his script reading *"Isachne lepidota Steudel in Flora 1846 p. 19. nomen infaustum; nodi saepe glabriusculi, folia sublepidoto asperula."* The specific name *lepidotum* is deviated from the character of the species. For this species bears in all its vegetative parts curious scattered short scaly or squamiform hairs, especially visible under a strong lens, the nodes of the culms are glabrous and here these hairs are not very conspicuous; so Steudel's note on the label after "nomen infaustum", cited above, is well understandable. Siebold's collection of *Isachne globosa* is very good and large and although these plants are not the actual types of Steudel they are, as identified by him, of great value for one who has to form an opinion of *Isachne globosa*. *Isachne australis* R. Br. described in 1810 from Australia is the same species, as to the material seen from that region.

The characters to recognize this *Isachne globosa*, besides the nectariferous spots on the pedicels, are chiefly the following: the nodes are quite glabrous, that is without any hairs or pubescence, the two glumes are equal in length, many-nerved, glabrous, obtuse, tips rounded and more or less hyaline margined, there are two glabrous flowers per spikelet, unequal in length, the third glume is longer and more acute than the fourth glume which is more rounded and as long as glume I and II. When the spikelet is closed glume III is protruding above it. The spikelets are 2.25—2.5 mm long. Only plants agreeing in these characters are to be accepted as true *Isachne globosa*. The species, defined in this way, has a large distribution, it occurs from Japan westward through China, Indo-China and Central India, always in the hotter parts, and south to Burma and Ceylon and is known from the Philippines (rare), Celebes, Sumatra and Java, Australia and New Zealand. Most of the synonyms given by Hooker f. in his Flora of British India belong to this species with exception of *Panicum nodibarbatum* Hochst., in Plantae Hohenackerianae no. 127, published in 1854 by Steudel. This is a distinct endemic species from the Nilghiri Hills with densely villous nodes, and shorter broader leaves. It is transferred by me to the genus *Isachne* as **Isachne nodibarbata** (Hochst.) Henr. nov. comb. based on Hochstetter's no. 127 as published by Steudel Synops. (1854) p. 95.

Isachne globosa (or *australis*) is not mentioned by Buse in his treatment of the Javanese grasses, collected by Junghuhn. The latter collected *Isachne globosa*, however, in Sumatra near Padang and in Java near Batavia and Djokjakarta. Buse did not recognize them and

regarded them as the allied *Isachne miliacea* ROTH. The plants from Padang were described by him as *Isachne miliacea* ROTH var. *obscura* BUSE, the glumes are upwards, along the nerves, very rough and provided there with long hairs. Under *Isachne globosa* O. K. it is placed therefore as a variety **obscura** (BUSE) HENR. nov. var. based on BUSE's variety under *Isachne miliacea* ROTH.

Isachne miliacea ROTH as described by ROEMER and SCHULTES Syst. II (1817) p. 476 is considered as an earlier name for *Isachne minutula* (GAUDICH.) KUNTH. Under the last name the species was known to BUSE, who described ZOLLINGER's no. 271 as *Isachne minutula* KUNTH var. *javanica* BUSE. But the same number ZOLLINGER 271 was mentioned by MORITZI in Syst. Verzeichniss (1846) p. 102 as *Panicum obliquum* ROTH with a question-mark, and in 1854 by ZOLLINGER in Syst. Verz. Heft 1. (June 1854) the same number 271 as "*Isachne Kuntheana* NEES MS. Ad marginem paludium pr. Tjikoya" on p. 54. The latter is a nomen nudum, STEUDEL mentioned the same number 271 when he described the *Panicum Kunthianum* WIGHT et ARNOTT in his Synopsis (1854) on p. 96 giving *Panicum obliquum* Zoll. herb. 271? and *Isachne Kunthiana* NEES mpt. as synonyms. STEUDEL's description of *Panicum Kunthianum* WIGHT et ARNOTT as published by him, was based on *Isachne Kunthiana* WIGHT et ARNOTT, nom. nudum in WIGHT cat. no. 1659, which therefore becomes the type of *Panicum Kunthianum* WIGHT et ARNOTT ap. STEUDEL Synopsis p. 96. This type, however, is totally different from ZOLLINGER's number 271. *Isachne minutula* KUNTH var. *javanica* BUSE based on ZOLLINGER 271 in the Rijksherbarium is certainly MORITZI's *Panicum obliquum* and differs from the typical *Isachne miliacea* ROTH in the setulose-viscid spikelets, hence its name becomes **Isachne miliacea** ROTH ap. R. et S. var. **javanica** (BUSE) HENR. nov. var.

Miss CAMUS identified *I. miliacea* ROTH as *I. polygonoides* (LAMK.) DOELL. The latter, however, is a different American species characterized by the pubescent very dissimilar flowers of the spikelets and the ovate-clasping blades.

We have now to discuss the species, described by STEUDEL as *Panicum Kunthianum* WIGHT et ARNOTT, based on WIGHT Cat. 1659, from Ceylon. This species is described by HOOKER in Fl. British India p. 21 as *Isachne Kunthiana* WIGHT et ARNOTT but that is a herbarium name and a nomen nudum, placed by THWAITES in Enum. Pl. Zeyl. definitively under *Isachne*, but MIQUEL published *Isachne Kunthiana* NEES in 1855 in his Flora Ind. Bat., Vol. III p. 460. MIQUEL's description was prepared from ZOLLINGER's no. 271, his determination was wrong but he

intended to transfer *Panicum Kunthianum* WIGHT et ARNOTT in Hb. WIGHT, STEUD. l. c. p. 26 to the genus *Isachne*. In such a case, so often occurring in the literature, the combination given from a validly published name but transferred to a wrong species is nevertheless valid. See *Digitaria filiformis* (L.) KOELER, described from a European species but transferred to a different American one. *Panicum Kunthianum* is therefore to be named *Isachne Kunthiana* (WIGHT et ARN.) NEES ap. MIQUEL. THWAITES's combination for the Ceylon plant is given in the year 1864 and invalid on account of the earlier one in 1855.

The true *Panicum Kunthianum* was found by BLUME in Java on Mount Gedeh, Rawa Tjiburrum and is, so far as I could find out a weak annual, procumbent and rooting at the nodes with short, more or less contracted panicles. BLUME's plant agrees with material seen from Sumatra (Padang, Banka, Enggano) and Borneo. At present the definite status of the species cannot be given as the actual type (WIGHT no. 1659) was not at my disposal. We are therefore totally dependant on HOOKER's treatment of this species, which he mentioned from the Nilghiri and Travancore Hills, Singapore, Ceylon, Java and Borneo; HOOKER certainly did not see Javanese material, he cited only MIQUEL's data, but he certainly studied WIGHT 1659 from Ceylon and his description agrees with STEUDEL's *Panicum Kunthianum*.

STEUDEL's description runs as follows: "culmo repente; foliis ovato-lanceolatis subcordatis vaginisque tuberculatis hirsutisque; ligula setosa; panicula parva ovali rigida (vix pollicari) e ramulis alternis 4—5 patentibus sub-6-floris; pedicellis 2 inferioribus subbifloris, 2 superioribus unifloris; spiculis minimis ovatis monoicis, inferiore flosculo hermaphrodito-masculo laevi, superiore stipitato foemineo hirto; glumis flosculos superantibus apicem versus e tuberculis hirsutis."

HOOKER says (l. c. p. 21): "stem 6—10 in. more or less hairy, leaves ovate or ovate-oblong, panicle 2—2½ in., branches few, gl. I and II subacute or subcuspidate 7—9 nerved. Stem ascending, geniculate, branched. Leaves ½—2½ in., striate, spreading, smooth or scaberulous above, base cordate, midrib and nerves obscure; ligule of hairs. Panicle 2—2½ in.; branches short, rather stout, at length horizontal, pubescent or glabrous. Spikelets $^1/_{20}$—$^1/_{16}$ in., very shortly pedicelled; gl. I and II smooth hispid or bristly; III and IV subequal or III rather the largest, glabrous or puberulous." STEUDEL described only one species, but HOOKER's description applies to two species, one of low and another of high elevations. The Javanese specimen form Mount Gedeh is not exactly located as to its altitude. The corresponding specimens were all found

at low altitudes. Banka 100 m, Borneo 700 m, Enggano 100 m.

From HOOKER's *Isachne Kunthiana* we have to exclude the Nilghiri plant (I saw PERROTTET 1353), with pubescent nodes and a more open different panicle. This plant is better considered as a distinct species, it was described by STEUDEL as *Panicum Metzii* HOCHST. which now becomes **Isachne Metzii** (HOCHST.) HENR. nov. comb. based on HOHENACKER's plant no. 1276. *Isachne Metzii* HOCHST. ex HOOK. F. Fl. Brit. Ind. VII. 21 as given in the Kew Index is only a synonym under *Isachne Kunthiana.*

After the elimination of this species there remains a much more homogeneous species agreeing in its chief characters with STEUDEL's description of *Panicum Kunthianum.* This species has tuberculate, cuspidate, equal glumes, much longer than the two flowers, one of them being glabrous, the other pubescent. In other characters it agrees with STEUDEL's description. As long as the various species from Ceylon, as hitherto described are not critically treated, we are not able to establish correct names and we are for the moment forced to accept the name of the grass of Mount Gedeh as proposed by me above. I am not certain as to the identification of STAPF's *Isachne Kunthiana* NEES from Mount Kinabalu, collected by HAVILAND no. 1408 at 8000 feet. This number is cited also by MERRILL in his bibliographic enumeration of Bornean plants. It may be an allied species of the *I. pangerangensis* group.

Another species from rather low altitudes is *Isachne miliacea* ROTH. It was insufficiently described by ROEMER and SCHULTES in 1817 from ROTH's manuscript. The locality is given only as "in India Orientali". The description runs as follows: "panicula subeffusa capillari, ramis subverticillatis ramulisque asperis flexuosis, spiculis ovalibus obtusissimis, mascula corolla femineam supereminente, foliis lineari-lanceolatis asperis, vaginis margine ciliatis. Corolla exterior mascula oblonga, interiore feminea ex subrotundo ovata dorso pubescente paullo longior."

ROTH afterwards (in 1821) gave a new, much longer description, the type was cited as collected by HEYNE ex India orientali, and it may be located, as HEYNE collected near Madras and his large collections were studied and published by ROTH in his Novae Plantarum Species. The diagnosis of ROTH's *Isachne miliacea* agrees verbatim with that of ROEMER and SCHULTES (they copied indeed from ROTH's manuscript). From this diagnosis and from the more exact data given by ROTH we are able to recognize the species. This *Isachne miliacea* is a species with many characters in common with *I. globosa.* From the large material, seen by me, it is evident that in the spikelet characters there are no

striking differences, the spikelets are only much smaller, only 1.8 to scarcely 2 mm long, the equal lower glumes are, however, faintly nerved and subpubescent on the back, the lower oblong masculine glabrous floret is longer than the glumes and the upper hermaphrodite one is pubescent, ovate and obtuse and as long as the glumes. These characters agree with *I. globosa,* which has a different panicle and larger spikelets. The diversity between the two flowers in each spikelet is, however, much more striking in *I. miliacea,* the latter is, moreover, very distinct in the vegetative parts, being a much more elegant and smaller species with thinner culms and short broad ovate-lanceolate blades. The affinity with *Isachne globosa* is much expressed also by the same nectariferous spots, found on the pedicels, especially at maturity.

Panicum adstans STEUD., (type CUMING 2288 from Malacca) belongs in all its characters to *Isachne globosa* and is therefore wrongly placed by MIQUEL and by BACKER under *I. miliacea,* but correctly placed by HOOKER.

Panicum Benjamini published by STEUDEL is merely a superfluous name for ROTH's species, the description of ROTH was copied and *Isachne miliacea* ROTH cited as a synonym.

A most puzzling complex was accepted by BACKER in his "Handboek" as *Isachne pangerangensis* ZOLL. et MOR. sensu ampliato. This is indeed the first valid name for a very distinct species, most insufficiently described by MORITZI in his Syst. Verz. (1845—46) p. 102. It was based on ZOLLINGER's no. 1917, collected in graminosis siccis udisque montis Pangerango 8—9000′ s.m. Febr. 1844, and published with the following description: "caespitosa foliis distychis lanceolatis acuminatis concinne multisulcatis duris margine setoso-ciliatis panicula simplici pauciflora (4—8 fl.)". This description is, indeed, insufficient to recognize the species as nothing is said about the various important characters of the spikelets.

When STEUDEL treated the species in 1854, he gave a longer description, but is is not quite certain that he saw the actual type of ZOLLINGER and MORITZI, which is probably in the Vienna Herbarium. STEUDEL, however, cited the number 1917 of ZOLLINGER as being his *Panicum pangerangense* and I take it for granted that he treated the same species as did MORITZI. STEUDEL's description runs as follows: "Radice subrepente caespitifera; culmis humilibus simplicibus vel ramosis (1—2-pollicaribus vix longioribus) undique vaginis hirsutis tectis; foliis distichis lanceolatis acuminatis duriuscule rigidis concinne nervosis, margine setoso-ciliatis, post lapsum setularum denticulatis ($^1/_2$—$^3/_4$″ longis,

1—2‴ latis); paniculae simplicis radiis solitariis vel binis pauci-(2—6-)-floris; spiculis brevi-pedicellatis obovatis obtusis; glumis floseulos subaequantibus (non patulis) glabris striatulis vix mucronulatis; hermaphroditis subaequalibus glabris obtuse mucronatis. Forsan P. Zollingeri Steud. (nr. 797) var.?" From this good description the plant is indeed recognizable by the short, up to 5 cm long stems, densely obtected by the hirsute sheaths; the distichous acuminate rather rigid blades, setosely ciliate along the margins, the subsolitary branches of the panicle, with few short-pedicelled flowers, the obovate obtuse spikelets, the subequal glabrous glumes, which are scarcely mucronate and the equal glabrous obtusely mucronate lemmata, are important characters given in this description. KOORDERS gave in his Excursionsflora a very short description which applies to that of STEUDEL and said that this species was only known to him from the 3060 m high summit of the Pangerango, but afterwards he mentioned, besides many specimens from the Pangerango, also Mount Papandajan as a locality.

ZOLLINGER's number 1917 is not represented in the herbarium at Leiden; to BUSE, who studied the Javanese grasses from that Herbarium, this plant was unknown, even MORITZI's description, although already published in 1846, is not mentioned in BUSE's Enumeratio from 1854. BUSE had the beautiful collections made by JUNGHUHN at his disposal. He studied them accurately and his misidentifications are principally caused by the lack of material for comparison, especially as to authentic material.

Thus it is well to understand that ZOLLINGER's species, represented in JUNGHUHN's collection was described once more as *Isachne monticola* BUSE from the central plateau of Mount Mandalawangi. The type material was at my disposal and agrees with STEUDEL's description of *Panicum pangerangense* with exception of the pubescent flowers, mentioned by BUSE. BUSE's type material from JUNGHUHN is quite uniform and the material of REINWARDT, mentioned afterwards by him is quite similar. It is therefore rather certain that we know what we have to accept as the typical *Isachne pangerangensis*. Before we treat other varieties of the species, it is noteworthy that this status was also found in the Philippines and described by MERRILL as *Isachne vulcanica* MERR. from Negros. This species belongs as to the description and the material seen (MERRILL no. 6975 duplic. type, and KNEUCKER's exsicc. no. 810) to BUSE's *Isachne monticola*, having sparingly pubescent lemmata, but differs slightly in the tubercle-based hairs on the glumes upwards and in the thickened margins of the blades which are not rigidly long ciliate

as in the true *I. pangerangensis.* All these specimens compared are at once recognized as belonging to but one species, a species very distinct by the *"very shortly pedicelled"* spikelets in much reduced panicles. The so-called *I. pangerangensis* from Borneo f. i., with long pedicelled spikelets, represents a different species. To recognize the true *Isachne pangerangensis* we have therefore besides the curious cushionlike habit, the form of the inflorescence and the characters of the spikelets with their equal or nearly equal glumes, the lower one rather abruptly although very shortly mucronate, the upper one obtuse. In the closed spikelets the two glumes are slightly longer than the two equal flowers. in the open mature spikelets, by the development of the lemmata and paleae, gl. II becomes as long as gl. IV or even slightly shorter, gl. I is but minutely longer than III and becomes somewhat inrolled and more acute. The ripe open spikelets with their much swollen flowers have therefore an aspect different from the younger still closed ones.

There is another plant from Java to treat here, viz. *Panicum rhignon* STEUDEL with *Isachne rigida* NEES mpt. as a synonym. I did not see this plant but the good description of STEUDEL enables us to recognize it. The description says: "Culmis humilibus caespitosis; foliis confertis lanceolatis striatis vaginisque e tuberculis setoso-ciliatis; paniculae parvae racemosae compositae radiis strictis patulis oligostachyis; spiculis alternis brevipedicellatis obovatis; flosculis glabris aequalibus, inferiore foemineo, superiore masculo; glumis patulis, inferiore mucronata, superiore obtusa. Variat: culmo apice simpliciter racemoso."

We learn from this description, that most of the given characters apply to *Isachne pangerangensis,* but we find also some differences, although the vegetative parts perfectly agree; the panicles deviate in being racemose and more compound, with strict, longer, spreading, but few-flowered branches; the shortly pedicelled glabrous spikelets point to *I. pangerangensis,* although the glumes seem to be longer and the lower one more acute. Specimens agreeing with these data occur indeed in the collections at my disposal and represent a distinct status of the species as treated here. The longer, stiffly spreading branches, with the short branchlets, bearing shortly pedicelled, more acute spikelets are the most important and striking characters. If this form is not specifically distinct from the typical *Isachne pangerangensis,* it is certainly worthy to be kept separate as a variety. *Isachne rigida* NEES ap. MIQUEL Fl. Ind. III p. 461 represents the same plant, STEUDEL's description of *Panicum rhignon* was copied and *Isachne rigida* NEES mss. and *Panicum rhignon* STEUD. were given as synonyms. MIQUEL observed already

"Anne eadem ac I. monticola licet diagnosi depugnante?" JUNGHUHN's specimen cited by MIQUEL is indeed BUSE's *I. monticola* and *I. pangerangensis*, the latter was not seen by MIQUEL who only copied the description of STEUDEL.

Isachne rigida NEES as accepted by HOOKER in Fl. Br. Ind. p. 24 is a very different species with a small pyramidal glandular panicle, according to the description, and with few scarcely 1½ mm long, hispid spikelets on long, slender pedicels. This species from Tenasserim and the Nicobar Islands cannot bear the name of *Isachne rigida* on account of MIQUELS' earlier name for a different species. It may be **Isachne pilulifera** (NEES) HENR. based on *Panicum piluliferum* NEES ap. STEUD. Synops. (1854) p. 94. HOOKER said: "I take this to be the Javan *I. rigida* Nees, from Steudel's description. It further agrees well enough with the descriptions of *I. firmula* and *I. monticola* Buse." There are in HOOKER's description as pointed out by me above, very important differences between the Javanese plant and the Indian one, so that we do not at all agree with HOOKER's statement. Accepting STEUDEL's species *Panicum rhignon* as a variety of *Isachne pangerangensis* Z. ET M. its name becomes var. **rhignon** (STEUD.) HENR. nov. var. based on STEUDEL's species of that name.

BUSE described from the "*pangerangensis*" group also another species, viz. *Isachne firmula* BUSE from Mt. Oengaran and Mt. Kawi in Java. A renewed inspection of the types gave as the result that this species is in nearly all its characters a large form of *Isachne pangerangensis*. It is at first sight a very different-looking plant but, as may already be seen from BUSE's description, not with very striking differences. In the spikelets BUSE's plants differ only by the hairy glumes and in the vegetative parts by the glabrous sheaths, ciliate only along the margins, although BUSE described also a very hirsute variety as *β marginata* BUSE. The larger, although contracted panicle, much resembles an enlarged panicle of the true *I. pangerangensis*, of which the var. *marginata* represents a more closely allied form. BUSE's species is certainly not worthy of specific rank and even not as characteristic as STEUDEL's *Panicum rhignon*. BUSE's plants may therefore only be accepted as var. **firmula** (BUSE) HENR. nov. var. of *Isachne pangerangensis* Z. ET M. Recently, HITCHCOCK, in his article on the Papuan grasses collected by BRASS, accepted *Isachne firmula* BUSE and *Isachne pangerangensis* Z. ET M. as two different species. Indeed, with the types only before us we are inclined to accept them as distinct, but they are connected by BUSE's var. *marginata* although I did not find series gra-

dually merging into each other. I did not see the grasses from the BRASS-collection, which are unfortunately not represented in our herbarium.

A different opinion as to these various species is given by Miss CAMUS in Fl. génér. de l'Indo-Chine. Under *Isachne Myosotis* NEES described in 1850, she mentions as synonyms *I. firmula* BUSE, *I. rigida* NEES, *Panicum Rhignon* STEUD. and *Panicum piluliferum* NEES. *Isachne Myosotis* NEES, treated as an annual species, is different from *Isachne Myosotis* BENTHAM. It is, however, evident that Miss CAMUS copied the wrong synonymy from HOOKER.

Some other species of *Isachne* are not yet recognized, viz. *Panicum batavicum* STEUD., published with the name *Isachne javana* NEES as a synonym. STEUDEL's species is probably a large form of *Isachne globosa* O. K. Such a robust state of this species was collected by BALANSA near Batavia. This plant fairy well agrees with STEUDEL's description. HOOKER accepted *Isachne javana* NEES ap. MIQUEL as a member of the Flora of British India. He tells us that it is a much larger plant than *Isachne australis* (*globosa*), but his description differs in various respects from that of STEUDEL and certainly points to another species with ciliolate nodes, lax panicles with very long and slender branches and pedicels and obscurely nerved glumes. Without HOOKER's British Indian material (from Upper Burma, Malacca and Perak), it is however, impossible at present to establish the species and it is impracticable to propose a name for it.

Isachne pulchella ROTH was formerly accepted as being a species of the genus *Sphaerocaryum* NEES. The latter is a monotypic genus with *I. elegans* NEES as the type. On account of HOOKER's statement that *Isachne pulchella* ROTH was a synonym of NEES's species, MERRILL made in 1916 the combination *Sphaerocaryum pulchellum* (ROTH) MERR.. CAMUS made the same combination in 1923, overlooking that of MERRILL. Recently PILGER has pointed out that ROTH's *Isachne pulchella* according to his type at Berlin, does not belong to the genus *Sphaerocaryum* but is a species of *Isachne* with two flowers per spikelet, the lower ones oval-oblong, less indurated and smaller, the upper ones oval, ventricose and pubescent. PILGER's discovery made it necessary to accept a new name for the species of the genus *Sphaerocaryum,* but at the same time ROTH's name *pulchella* became valid for a species of *Isachne.* PILGER proposed for the species of *Sphaerocaryum* the name *S. malaccense* (TRIN.) PILGER. This species, although occurring in our Archipelago is not yet found in Java. It is a pity that PILGER, who studied ROTH's *Isachne pulchella,* did not indicate its synonyms. We therefore do not know at present which species of *Isachne* must bear ROTH's name.

I will try to give a solution. Studying the *Isachne miliacea* of ROTH such as it is generally accepted in the literature, it is a striking fact that there occur in this species two groups, one with larger and one with smaller spikelets. Both have a male flower longer than the female one and these are of a different form and outline. It is probable that both forms were known to ROTH, the form with larger spikelets is the *I. miliacea* ROTH as represented by MERRILL's plants from the Philippines (KNEUCKER's exsicc.). The form with much smaller spikelets is probably STEUDEL's *Panicum bellum,* a new name given to ROTH's *Isachne pulchella.* STEUDEL consequently accepted both species of ROTH as two distinct species. In KUNTH's Enumeratio (1833) we find *I. miliacea* and *I. pulchella* maintained as two different species. As to the plants occurring in Java we know that ZOLLINGER's No. 271 is such a small-flowered specimen which agrees in its characters with ROTH's description of *I. pulchella.* I am inclined to accept the two species of ROTH as valid ones, not only on account of the differences in length of the spikelets but also on account of the statements in the literature that the "nodes of stem are glabrous or ciliate". This is mentioned by HOOKER, and BACKER mentions quite independently from HOOKER that the leaf sheaths are often hairy all-round at the base on the nodes. Now it is possible that the character of the nodes (hairy or not) runs parallel with the length of the spikelets, in which case we have a good support for the diversity of both species.

In the genus *Digitaria,* which has for many years been extensively studied by me and of which a big manuscript with all the critical data is almost finished, we had formerly for the Javanese flora 7 species, which are treated in BACKER's well-known "Handboek voor de Flora van Java", Afl. 2 (1928). My own investigations have brought this number to 16 species. In BACKER's book we find on p. 125 *Digitaria Perrottetii* BACKER, a species which occurs between 1200 and 2300 m above sealevel in various localities from West to East Java. I had found it already in our herbarium at Leiden and recognized it as a very distinct species which I named *Digitaria remota* HENR.. It is evidently very distinct from KUNTH's *Panicum Perrottetii,* which was described from West Africa and is a totally different species. It is more allied to the so-called *Paspalum Perrottetii* HOOK. F. from British India; the latter is, however, also a different species, which has to bear the name *Digitaria Wallichiana* STAPF. *Digitaria Perrottetii* BACKER is, of course, invalid on account of STAPF's earlier combination for the African species.

I give here the following description of the new species.

Digitaria remota HENR. nov. spec. Perennis, culmi tenues, partim repentes, partim adscendentes vel erecti, glabri, plurinodes, floriferi ad 50 cm vel plus alti; internodia inferiora haud rariter hirsuta. Vaginae foliorum basin versus pilis longis praeditae, superne glabrae vel sparse pilosae; ligula elongata, scariosa, ad 5 mm longa, laminae 4—8 cm latae, 5—17 cm longae, lineari-lanceolatae, sensim angustatae, marginibus scabris, utrinque vel supra tantum pilis sparsis, patentibus, basi tuberculatis, praeditae. Inflorescentia paniculata, ambitu ovali-oblonga, patula, rhachi communi ad 10 cm vel plus longa, ramis subverticillatis 8—10, interdum ad 20, verticillis distantibus; racemi inferiores paniculae 7 vel interdum ad 10 cm, summi interdum vix 3 cm longi, laxiflori, ad basin breviter nudi. Spiculae binae, remotae, altera breviter pedicellata, pedicello ½—1 mm longo, altera longiter vel longe pedicellata, pedicello 2—3 mm longo, 2—2½ mm longae, purpurascentes, ovato-oblongae vel ovato-lanceolatae; gluma inferior nulla vel rudimentaria, gluma II spicula paulo brevior, lanceolata, acutiuscula, 3-nervis, gluma III spiculam aequans, 7-nervis, nervis prominentibus, plus minusve aequidistantibus, ambae inter nervos et versus marginis pilis albis brevissimis haud raro subobsoletis, appressis, seriatim obsitae, gluma IV (lemma fertilis) spiculam vix aequans, lanceolato-oblonga, breviter acuminata, convexa, chartacea, subtiliter punctulata vel punctato-striolata, ad maturitatem fuscescens. Antherae ad 2 mm longae. Fructus ad 1¼ mm longus.

Java: Soerakarta; Bojolali, leg. BEGUIN in 1918. Typus speciei in Herb. Lugd. Bat. sub no. 920.248—59.

Kediri; Malang, Goenoeng Kawi, west slope G. Boetak, circ. 2300 m. leg. DOCTERS VAN LEEUWEN-REIJNVAAN no. 12425 in 1929.

Besoeki; Ijang plateau, circ. 2300 m. leg. KOORDERS no. 43571 in 1916.

Besides these specimens in the collection of the Rijksherbarium, I saw many other plants from various localities in Java, in BACKER's private collection.

Digitaria longiflora (RETZ.) PERS., although somewhat variable as to the habit of the vegetative parts, is always very characteristical by its verrucose hairs on the spikelets. This character is always the proof against *Digitaria violascens* LINK, which lacks these hairs, although there are other important characters to separate the two species. I demonstrated formerly that the plants with perfectly glabrous spikelets had, moreover, different spikelets and such plants belonged to a distinct species which was already described by BUSE as *Digitaria pseudoischaemum*. I made also the new combination *Digitaria fuscescens* (PRESL)

HENR., which was based on *Paspalum fuscescens* PRESL. Having studied authentic material of PRESL's species I recognized that it is conspecific with BUSE's plant. This Javanese grass has therefore to bear the earlier name *Digitaria fuscescens*. It is noteworthy that this species was known long before PRESL described it, but is was not recognized. FLUEGGE, who in 1810 treated *Paspalum longiflorum* RETZ. in his monograph, described it as having hairy or glabrous spikelets. The plant with glabrous spikelets (our *D. fuscescens*) was collected by DU PETIT THOUARS in Mauritius and was cited by FLUEGGE. Mr. HUBBARD at Kew has seen this plant in the British Museum and recognized it as BUSE's species, which is quite in accordance with FLUEGGE's data and with my own investigations. It is very probable that this *Digitaria fuscescens* was also known to DESVAUX, who described it in his Opuscules in a chapter: Observations sur les Graminées et description de genres et espèces nouvelles de cette famille, as *Paspalum micranthum* DESV. "Crescit in insula Borboniae aut Mauritii." Unfortunately I failed to look for the type when I visited Paris, but DESVAUX's description and his locality are in accordance with our knowledge of *Digitaria fuscescens*. DESVAUX's species was published in 1831, but PRESL's name has priority if the two species are identical.

Concerning the *Digitarias* of Java it is quite certain that the true *Digitaria sanguinalis* does not occur in the tropical regions. What is called *Digitaria sanguinalis* in BACKER's "Handboek", is commonly the tropical *Digitaria adscendens* (H. B. K.) HENR., but often also other more or less allied species, such as *Digitaria timorensis* (KUNTH) BALANSA, *Digitaria microbachne* (PRESL) HENR. and more rarely *Digitaria bicornis* (LAMK.) R. ET SCH. The latter is an earlier name for a species, described by WILLDENOW as *Digitaria barbata,* which was confounded by HOOKER with *Panicum heteranthum* NEES. For the latter I have already proposed the name *Digitaria dispar* HENR. This species was hitherto only known from the Asiatic continent. It was found, however, also on the island of Madoera by Prof. JESWIET. I was so fortunate as to find his good material which was determined as *Digitaria eminens* BACKER which is a totally different species.

Index.

Acroceras 445—451 — *A. crassiapiculatum* (MERR.) ALSTON 448 — **A. Munroanum** (BALANSA) HENR. 444, 446—449 — **A. paucispicatum** (MORONG) HENR. 449, 451 — *A. Ridleyi* STAPF 445—448 — *A. sparsum* STAPF 446—452 — **A. tonkinense** (BALANSA) HENR. 451 — *A. zizanioides* (H. B. K.) DANDY 445, 449, 450 — *Agrostis* 436, 438 — *A. infirma* BUSE 437—439 — *A. montana* REINW. 436, 437 — *A. Reinwardtii* v. HALL 437—439 — *A. rigidula* STEUD. 438 — *A. stolonifera* L. 438, 439 — *A. stricta* BUSE 437, 438 — *A. stricta* WILLD. 437 — *Aira arundinacea* L. 424 — *Amphibromus* 429 — *Amphilophis* 456 — *Andropogon* 452 — *A. amaurus* BUSE 455 — *A. assimilis* HOOK.f. 460—462 — *A. assimilis* STEUD. 460—462 — *A. capilliflorus* STEUD. 457 — *A. caucasicus* TRIN. 456 — *A. cinctus* STEUD. 457, 459, 460 — *A. compressus* HOOK. f. 456 — *A. concanensis* HOOK. f. 457 — *A. diversiflorus* STEUD. 455 — *A. ensiformis* HOOK. f. 457 — *A. fasciculatum* L. 453, 454 — *A. firmandus* STEUD. 455 — *A. Foulkesii* HOOK. f. 457 — *A. glaber* ROXB. 456 — *A. glaucopsis* STEUD. 460—463 — *A. Haenki* PRESL 456 — *A. Hugelii* HACK. 458, 460 — *A. intermedius* R. BR. 456 — *A. Ischaemum* L. 457 — *A. Kuntzeanus* HACK. 456 — *A. macrourus* var. *glaucopsis* ELLIOTT 462 — *A. micranthus* KTH. 459—461 — id. var. *spicigerus* BENTH. 459 — *A. micranthus spicigerus* (BENTH.) HACK. 457, 458 — *A. modestus* BACKER 456 — *A. montanus* HACK. 460, 463 — *A. montanus* ROXB. 460 — *A. parviflorus* 461 — *A. pertusus* (L.) WILLD. 456 — *A. pseudischaemum* NEES 457 — *A. punctatus* TRIN. 456 — *A. rufispica* STEUD. 455 — *A. subrepens* STEUD. 460—463 — *A. trispicatus* SCHULT. 453 — *A. tristachyus* H. B. K. 453 — *A. tristachyus* ROXB. 453 — *Andropogoneae* 452 — *Aristida arundinacea* L. 439 — *A. rhiniochloa* HOCHST. 411 — *Arundo* 439 — *A. madagascariensis* KUNTH 439 — *A. Reynaudiana* KUNTH 439 — *A. Zollingeri* BUSE 439 — *Avena* 425, 428 — *A. adzharica* ALBOV 429 — *A. agropyroides* BOISS. 430 — *A. albinervis* BOISS. 429 — *A. alpina* SM. 431 — *A. armeniaca* SCHISCHK. 429 — *A. aspera* MUNRO ex THW. 425—427 — id. var. *Roylei* HOOK. f. 427 — id. var. *Schmidii* HOOK. f. 427 — *A. Blauii* ASCH. & JANKA 430 — *A. breviaristata* BARR. 430 — *A. bromoides* GOUAN 429 — *A. compacta* BOISS. & HELDR. 430 — *A. compressa* HEUFF. 429 — *A. convoluta* PRESL 428, 430 — *A. dahurica* KOMAR. 429 — *A. decora* JANKA 430 — *A. Delavayi* HACK. 426, 427 — *A. Fedtschenkoi* HACK. 429 — *A. filifolia* LAG. 428, 430 — *A. Hackelii* HENRIQUES 430 — *A. Hookeri* SCRIBN. 429 — *A. Letourneuxi* TRAB. 430 — *A. macrostachya* BALANSA 430 — *A. mongolica* ROSHEV. 431 — *A. montana* VILLARS 430 — *A. Mortoniana* SCRIBN. 429 — *A. Neumayeriana* VIS. 430 — *A. planiculmis* SCHRADER 429 — *A. planiculmis* TURCZ. 429 — *A. polyneura* HOOK. f. 425 — *A. pruinosa* HACK. & TRAB. 430 — *A. Requienii* MUTEL 430 — *A. scabrivalvis* TRIN. 429 — *A. Schelliana* HACK. 429 — *A. setacea* VILL. 430 — *A. sulcata* GAY 430 — *A. versicolor* Auct. asiat. 429 — *A. versicolor* VILL. 426 — *A. virescens* REGEL 425 — *Avenastrum* 425, 428 — *A. asiaticum* ROSHEV. 429 — *A. asperum* (MUNRO) HAND.-MAZZ. 426 — id. var. *Roylei* (HOOK. f.) HAND.-MAZZ. 426 — *A. hissaricum* ROSHEV. 431 — *A. Humbertii* CAMUS 429 — *A. Krylovii* PAVL. 431 — *A. tianschanicum* ROSHEV. 429 — *Axonopus compressus* P. B. 442.

Bothriochloa O. K. 456 — **B. caucasica** (TRIN.) HENR. 456 — **B. compressa** (HOOK. f.) HENR. 456 — **B. concanensis** (HOOK. f.) HENR. 457 — **B. ensiformis** (HOOK. f.) HENR. 457 — **B. Foulkesii** (HOOK. f.) HENR. 457 — *B. glabra* (ROXB.) CAMUS 456 — *id.* ssp. **Haenkei** (PRESL) HENR. 456 — *B. intermedia* (R. BR.)

CAMUS 456 — **B. Ischaemum** (L.) HENR. 457 — **B. Kuntzeana** (HACK.) HENR. 456 — **B. modesta** (BACK.) BACK. & HENR. 456 — *B. pertusa* (L.) CAMUS 456 — **B. pseudischaemum** (NEES) HENR. 457 — *Brachiaria* 431, 432, 434—436, 450 — **B. Balansae** HENR. 435 — **B. bulawayensis** (HACK.) HENR. 436 — *B. dictyoneura* (FIG. & DENOT.) STAPF 433 — *B. epaleata* STAPF 432 — *B. extensa* CHASE 431 — **B. glabrinodis** (HACK.) HENR. 435 — *B. glomerata* (HACK.) CAMUS 436 — *B. humidicola* (RENDLE) SCHWEICK. 433 — *B. jubata* STAPF 433 — **B. keniensis** HENR. 432, 433 — **B. melanotyla** (HACK.) HENR. 436 — *B. mutica* (FORSK.) STAPF 433 — **B. numidiana** (LAMK.) HENR. 434 — **B. oligobrachiata** (PILG.) HENR. 436 — *B. plantaginea* (LINK.) HITCHC. 431 — **B. purpurascens** (RADDI) HENR. 434 — *B. reptans* (L.) GARDN. & HUBBARD 432 — **B. secernenda** (HOCHST.) HENR. 432 — *B. soluta* STAPF 432 — **B. ukambensis** HENR. 436 — **B. Venezuelae** (HACK.) HENR. 435 — *B. viridula* STAPF 433.

Capillipedium STAPF 457—462 — **C. arachnoideum** HENR. 458 — *id.* ssp. **luzoniense** HENR. 459 — *C. assimile* (STEUD.) CAMUS 460—462 — *C. cinctum* (STEUD.) CAMUS 460 — *C. filiculme* (HOOK. f.) STAPF 461 — *C. glaucopsis* (STEUD.) STAPF 460—463 — *C. Hugelii* (HACK.) CAMUS 458, 461 — *C. parviflorum* (R. BR.) STAPF 457, 459—461 — *id.* ssp. **capilliflorum** (STEUD.) HENR. 457, 459 — **C. subrepens** (STEUD.) HENR. 463 — *id.* var. **glaucophyllum** HENR. 463 — *Chaetochloa* 412 — *Ch. comosa* (STEUD.) KOIDZ. 412 — *Ch. rigida* SCRIBN. & MERR. 415 — *Chloris* 454 — *Chl. distichophylla* LAGASCA 454 — *Chl. fasciculata* (L.) THELL. 454 — *Chl. fasciculata* SCHRAD. 454 — *Chrysopogon parviflorus* var. *spicigerus* BENTH. 457 — *Cyrtococcum* 436, 450 — *C. patens* (L.) CAMUS 436 — **G. Schmidtii** (HACK.) HENR. 436.

Digitaria 473, 475 — *D. adscendens* (H. B. K.) HENR. 475 — *D. barbata* WILLD. 475 — *D. bicornis* (LAMK.) R. & SCH. 475 — *D. dispar* HENR. 475 — *D. eminens* BACK. 475 — *D. filiformis* (L.) KOELER 466 — *D. fuscescens* (PRESL) HENR. 474, 475 — *D. longiflora* (RETZ.) PERS. 474 — *D. microbachne* (PRESL) HENR. 475 — *D. Perrottetii* BACK. 473 — *D. pseudoischaemum* BUSE 474 — **D. remota** HENR. 473, 474 — *D. sanguinalis* SCOP. 475 — *D. timorensis* (KUNTH) BALANSA 475 — *D. violascens* LINK 474 — *D. Wallichiana* STAPF 473 — *Donax Thouarii* P. B. 439.

Echinochloa 444, 450 — *Eleusine indica* (L.) GAERTN. 454 — *Eragrostis* 416—425, 463 — *E. amabilis* (L.) WIGHT & ARNOTT 423 — *E. arundinacea* JEDWABNIK 424 — *E. arundinacea* (L.) ROSHEV. 424 — *E. bahiensis* SCHRAD. 420 — *E. caroliniana* (SPRENG.) SCRIBN. 417, 418 — *E. chariis* (STEUD.) HITCHC. 420 — *E. cilianensis* (ALLIONI) LINK. ap. VIGN. LUT. 420, 421 — *E. collina* TRIN. 424, 425 — *E. condensata* STEUD. 417 — *E. Damiensiana* BONNET ex THELL. 417, 418 — *E. erythrogona* NEES ap. STEUD. 416 — *E. Feriolana* MASSAL. 417 — *E. Frankii* C. A. MEYER ap. STEUD. 416 — *E. gangetica* (ROXB.) STEUD. 420 — *E. interrupta* BEAUV. 423 — *E. interrupta* (LAMK.) P. B. 423, 424 — *E. interrupta* STEUD. 424 — *E. japonica* (THUNB.) TRIN. 423, 424 — *id.* var. **interrupta** (LAMK.) HENR. 424 — *E. leersioides* (PRESL) GUSS. 421, 422 — *E. major* HOST 420—423 — *E. megastachya* (KOEL.) LINK 421, 422 — *E. mexicana* LINK 418 — *E. minor* HOST 421 — *E. multicaulis* STEUD. 418, 419 — *E. namaquensis* NEES 424 — *E. nigricans* SACCARDO 417 — *E. nigricans* (H. B. K.) STEUD. 417 — *E. Niwahokori* HONDA 419 — *E. parviflora* (R. BR.) TRIN. 418 — *E. pectinacea* (MICHX.) NEES 417 — *E. peregrina* WIEG. 417, 418 — *E. pilosa* (L.) BEAUV. 417—420 — *E. pilosa* STEUD., non P. B. 419 — *E. pilosa* var. *condensata* HACK. 417 — *id.* ssp. *Damiensiana*

(BONNET) THELL. 417, 418 — *id.* var. *Damiensiana* BONNET 417, 418 — *E. plumosa* (RETZ.) LINK 423 — *E. Pringlei* MATTEI 416 — *E. purpurascens* BALANSA 417 — *E. Purshii* SCHRAD. 419 — *E. pusilla* HACK. 416 — *E. pusilla* SCRIBN. 416 — *E. Scribneriana* HITCHC. 416 — *E. spectabilis* (PURSH) STEUD. 417 — *E. stenophylla* HOCHST. 420 — *E. suaveolens* BECKER 418 — **E. tatarica** (FISCH.) HENR. 425 — *E. tenella* (L.) P. B. 423 — *E. unioloides* (RETZ.) NEES 423 — *E. verticillata* (CAV.) P. B. 417, 419 — *E. verticillata* LINK 417 — *Eremopoa* 425 — *Eulalia* KUNTH 452, 453, 455 — *E. argentea* BRONGN. 453 — *E. Bequaerti* DE WILDEM. 453 — *E. contorta* (BRONGN.) O. K. 453 — *E. fimbriata* (HACK.) O. K. 453 — **E. leptostachys** (PILG.) HENR. 453 — *E. praemorsa* (NEES) STAPF 455 — *E. quadrinervis* (HACK.) O. K. 453 — **E. trispicata** (SCHULT.) HENR. 453.

Festuca caroliniana STEUD. 424.

Glyceria 418 — *Gl. airoides* STEUD. 418, 419.

Helictotrichon BESSER 425—427, 429 — **H. adzharicum** (ALBOV) HENR. 429 — **H. agropyroides** (BOISS.) HENR. 430 — **H. albinerve** (BOISS.) HENR. 429 — **H. alpinum** (SM.) HENR. 431 — **H. armeniacum** (SCHISCHK.) HENR. 429 — **H. asiaticum** (ROSHEV.) HENR. 429 — **H. Blauii** (ASCH. & JANKA) HENR. 430 — **H. breviaristatum** (BARR.) HENR. 430 — **H. bromoides** (GOUAN) HENR. 429 — **H. compactum** (BOISS. & HELDR.) HENR. 430 — **H. compressum** (HEUFF.) HENR. 429 — **H. convolutum** (PRESL) HENR. 430 — **H. dahuricum** (KOMAR.) HENR. 429 — **H. decorum** (JANKA) HENR. 430 — **H. Delavayi** (HACK.) HENR. 427 — **H. Fedtschenkoi** (HACK.) HENR. 429 — **H. filifolium** (LAG.) HENR. 430 — **H. Hackelii** (HENRIQUES) HENR. 430 — **H. hissaricum** (ROSHEV.) HENR. 431 — **H. Hookeri** (SCRIBN.) HENR. 429 — **H. Humbertii** (CAMUS) HENR. 429 — **H. Junghuhnii** (BUSE) HENR. 425 — **H. Krylovii** (PAVL.) HENR. 431 — **H. Letourneuxi** (TRAB.) HENR. 430 — **H. macrostachyum** (BALANSA) HENR. 430 — **H. mongolicum** (ROSHEV.) HENR. 431 — **H. montanum** (VILLARS) HENR. 430 — **H. Mortonianum** (SCRIBN.) HENR. 429 — **H. Neumayerianum** (VIS.) HENR. 430 — **H. polyneurum** (HOOK. f.) HENR. 425 — *H. pratense* (L.) PILGER var. **pseudolucidum** (HAUSM.) HENR. 430 — **H. pruinosum** (HACK. & TRAB.) HENR. 430 — *H. pubescens* (HUDS.) PILG. 429 — **H. Requienii** (MUTEL) HENR. 430 — **H. Schellianum** (HACK.) HENR. 429 — **H. Schmidii** (HOOK. f.) HENR. 427 — **H. setaceum** (VILL.) HENR. 430 — **H. sulcatum** (GAY) HENR. 430 — **H. tianschanicum** (ROSHEV.) HENR. 429 — **H. virescens** (NEES) HENR. 425 — *Hemigymnia* 450 — *Holous parviflorus* R. BR. 457.

Isachne 463—466, 472 — *I. australis* R. BR. 464, 472 — *I. elegans* NEES 472 — *I. firmula* BUSE 471, 472 — *id.* var. *marginata* BUSE 417 — *I. globosa* (THUNB.) O. K. 463, 464, 467, 468, 472 — *id.* var. **obscura** (BUSE) HENR. 465 — *I. javana* NEES 472 — *I. Kunthiana* (WIGHT et ARN.) NEES 465—467 — *I. lepidota* STEUD. 464 — *I. Metzii* HOCHST. 467 — **I. Metzii** (HOCHST.) HENR. 467 — *I. miliacea* ROTH 465, 467, 468, 473 — *id.* var. **javanica** (BUSE) HENR. 465 — *id.* var. *obscura* BUSE 465 — *I. minutula* (GAUDICH.) KUNTH 465 — *id.* var. *javanica* BUSE 465 — *I. monticola* BUSE 469, 471 — *I. Myosotis* BENTH. 472 — *I. Myosotis* NEES 472 — **I. nodibarbata** (HOCHST.) HENR. 464 — *I. pangerangensis* ZOLL. et MOR. 467—471 — *id.* var. **firmula** (BUSE) HENR. 471 — *id.* var. **rhignon** (STEUD.) HENR. 471 — **I. pilulifera** (NEES) HENR. 471 — *I. polygonoides* (LAMK.) DOELL 465 — *I. pulchella* ROTH 472, 473 — *I. rigida* NEES 470—472 — *I. vulcanica* MERR. 469.

Lasiacis 451 — *Leptatherum* NEES 452 — *L. Royleanum* NEES 452.

Microstegium NEES 452, 453, 454 — **M. Bequaerti** (DE WILDEM.) HENR.

453 — *M. ciliatum* (TRIN.) CAMUS 453 — **M. clavigerum** (BACKER) HENR. 453 — **M. delicatulum** (HOOK. f.) HENR. 455 — **M. dispar** (STEUD.) HENR. 453 — **M. eucnemis** (NEES) HENR. 455 — **M. fasciculatum** (L.) HENR. 453 — *M. gratum* (HACK.) CAMUS 455 — **M. montanum** (NEES) HENR. 455 — *M. nudum* (TRIN.) CAMUS 453 — **M. rufispicum** (STEUD.) HENR. 455 — **M. Stapfii** (HOOK. f.) HENR. 455 — **M. vagans** (NEES) HENR. 455 — *M. Willdenovianus* NEES 453 — *Milium globosum* THUNB. 463.

Nemastachys STEUD. 452 — *Neohusnotia* 450—452 — *Neyraudia* 439 — **N. arundinacea** (L.) HENR. 439 — id. var. **Zollingeri** (BUSE) HENR. 439 — *N. madagascariensis* (KUNTH) HOOK. f. 439 — *id.* var. *Zollingeri* (BUSE) HOOK. f. 439 — *N. Reynaudiana* (KUNTH) KENG 439.

Oryzopsis 452 — *O. fimbriata* H. B. K. 452 — *O. Seleri* PILG. 452 — *Ottochloa* 450.

Panicoideae 433 — *Panicum* 413, 431, 433, 436, 450 — *P. adhaerens* FORSK. 414 — *P. adstans* STEUD. 468 — *P. Aparine* STEUD. 413, 414 — *P. barbinode* TRIN. 433—435 — *P. batavicum* STEUD. 472 — *P. bellum* STEUD. 473 — *P. Benjamini* STEUD. 468 — *P. bulawayense* HACK. 436 — *P. caesium* NEES 444 — *P. cambogiense* BALANSA 444 — *P. colonum* L. 434 — *P. comosum* STEUD. 411, 412 — *P. crassiapiculatum* MERR. 444, 446—448, 450 — *P. cruciabile* CHASE 444 — *P. elegantulum* MEZ 435 — *P. geminatum* FORSK. 434 — *P. glabrinode* HACK. 435 — *P. glomeratum* HACK. 436 — *P. Helopus* TRIN. var. β MUNRO 444 — *P. heteranthum* NEES 475 — *P. Isachne australe* R. BR. 464 — *P. jubatum* FIG. & DENOT. 433 — *P. Kunthianum* WIGHT & ARNOTT 465—467 — *P. latifolium* HOOK. 445, 446 — *id.* var. *major* HOOK. 448 — *P. lepidotum* STEUD. 463 — *P. luzonense* PRESL 444 — *P. melanotylum* HACK. 436 — *P. Metzii* HOCHST. 467 — *P. Munroanum* BALANSA 444, 448, 450 — *P. muticum* FORSK. 433, 434 — *P. nodibarbatum* HOCHST. 464 — *P. nudiglume* HOCHST. 432 — *P. nudiglume* RICH. 432 — *P. numidianum* LAMK. 433—435 — *P. obliquum* RDTH 465 — *P. obliquum* ZOLL. 465 — *P. oligobrachiatum* PILG. 435 — *P. oryzetorum* BALANSA 444 — *P. oryzoides* ARDUINO 445 — *P. oryzoides* RIDL. 446 — *P. oryzoides* SW. 445, 446 — *P. paludivagum* HITCHC. & CHASE 434 — *P. pangerangense* STEUD. 460, 469 — *P. patulum* (SCRIBN. & MERR.) HITCHC. 435 — *P. patulum* MEZ 435 — *P. paucispicatum* MORONG 449 — *P. Perrottetii* KUNTH 473 — *P. piluliferum* NEES 471, 472 — *P. pubifolium* MEZ 436 — *P. pubifolium* NASH 436 — *P. purpurascens* OPIZ 433 — *P. purpurascens* RADDI 433, 434 — *P. pycnocomum* STEUD. 412 — *P. reptans* L. 431, 432, 435 — *P. respiciens* HOCHST. 414 — *P. rhignon* STEUD. 470—472 — *P. Ridleyi* HACK. 445—448 — *P. Ridleyi* HACK. f. *minor* HACK. 447 — *P. Schmidtii* HACK. 436 — *P. secernendum* HOCHST. 432 — *P. tonkinense* BALANSA 449—451 — *P. Venezuelae* HACK. 434 — *P. verticillatum* L. 413, 415 — *id.* var. *Miquelii* A. BR. 414 — *P. verticillatum* ROTTLER 414 — *P. viride* L. var. *gigantea* FRANCH. et SAVAT. 412 — *P. zizanioides* H. B. K. 445, 446, 449, 450 — *Paspalidium* 434, 435, 450 — **P. elegantulum** (MEZ) HENR. 435 — *P. geminatum* (FORSK.) STAPF 434 — **P. paludivagum** (HITCHC. & CHASE) HENR. 434 — *Paspalum* 433, 442, 451 — *P. auriculatum* PRESL 440 — *P. cartilagineum* PRESL 442, 451 — *P. Commersonii* LAMK. 441, 443 — *P. Forsterianum* FLUEGGE 441 — *P. frumentaceum* ROTTB. 442 — *P. fuscescens* PRESL 475 — *P. Kora* WILLD. 441, 442 — *P. longiflorum* RETZ 475 — *P. longifolium* ROXB. 440, 441, 443 — *P. Metzii* STEUD. 443 — *P. micranthum* DESV. 475 — *P. orbiculare* FORST. 440—442 — *P. Perrottetii* HOOK. f. 473 — *P. scrobiculatum* L. 439—443 — *id.* var. *frumentaceum*

STAPF 442 — *P. undulatum* POIR. 441 — *P. undulatum* SPRENG. 441 — *Paspalus Forsterianus* FLUEGGE 441 — *Piptochaetium* 452 — **P. Seleri** (PILG.) HENR. 452 — *Pollinia* SPRENG. 452 — *Pollinia* TRIN. 452, 453 — *P. Bequaerti* DE WILDEM. 453 — *P. ciliata* TRIN. 453, 454 — *P. clavigera* BACKER 453 — *P. delicatula* HOOK. f. 455 — *P. dispar* STEUD. 453 — *P. eucnemis* NEES 455 — *P. geminata* MERR. 453 — *P. grata* HACK. 455 — *P. leptostachys* PILG. 453 — *P. montana* NEES 455 — *P. montana* STEUD. 455 — *P. praemorsa* NEES 455 — *P. Stapfii* HOOK. f. 455 — *P. vagans* NEES 455 — *Polytrias* 455 — *P. amaura* (BUSE) O. K. 455 — *P. praemorsa* (NEES) HACK. 455 — *Poa* 418, 420—422, 425 — *P. amabilis* L. 423 — *P. caroliniana* SPRENG. 417 — *P. chariis* SCHULTES 420 — *P. chinensis* LINK 417 — *P. chinensis* L. 417 — *P. cilianensis* ALL. 420—422 — *P. elegans* LAMK. 419 — *P. elegans* POIR. 420 — *P. elegans* ROXB. 420 — *P. flava* L. 424 — *P. gangetica* ROXB. 420 — *P. interrupta* R. BR. 423 — *P. interrupta* LAMK. 423 — *P. japonica* THUNB. 423 — *P. megastachya* KOEL. 422 — *P. persica* TRIN. 425 — *P. Purshii* FISCHER, MEYER & A. LALL. 417 — *P. tatarica* FISCHER 425 — *P. tenella* L. 423 — *P. trivialis* L. 422 — *Psilantha* 425.

Sacciolepis 450 — *Setaria* 411—413, 415 — *S. adhaerens* (FORSK.) CHIOVENDA 414, 415 — *S. adhaerens* (FORSK.) LK. 414 — *S. Aparine* (STEUD.) CHIOVENDA 414 — *S. caudata* BEAUV. 415 — *S. comosa* (STEUD.) HONDA 412 — *S. comosa* (STEUD.) MIQ. 412 — *S. gigantea* MAKINO 412 — *S. macrostachya* H. B. K. 415 — **S. Palmeri** HENR. 415 — **S. pycnocoma** (STEUD.) HENR. 412 — *S. rigida* STAPF 415 — *S. Rottleri* SPRENG. 414 — *S. verticillata* (L.) P. B. 412—415 — *id.* ssp. *Aparine* A. BR. 415 — *Sphaerocaryum* 472 — *S. malaccense* (TRIN.) PILG. 472 — *S. pulchellum* (ROTH) MERR. 472 — *Stipa capillata* L. 428 — *S. gigantea* LAG. 428 — *S. juncea* L. 428 — *S. Lagascae* R. & SCH. 428.

Tridens 424, 425 — **T. carolinianus** (STEUD.) HENR. 424 — *T. Drummondii* (SCRIBN. & KEARN) NASH 424 — *Triodia* 424 — *T. Drummondii* SCRIBN. & KEARN 424 — *Trisetum* 425 — **T. Fedtschenkoi** HENR. 425 — *T. virescens* NEES 425 — *T. virescens* (REGEL) FEDTSCH. 425 — *T. virescens* STEUD. 426.

Urochloa 431, 432, 435, 450.