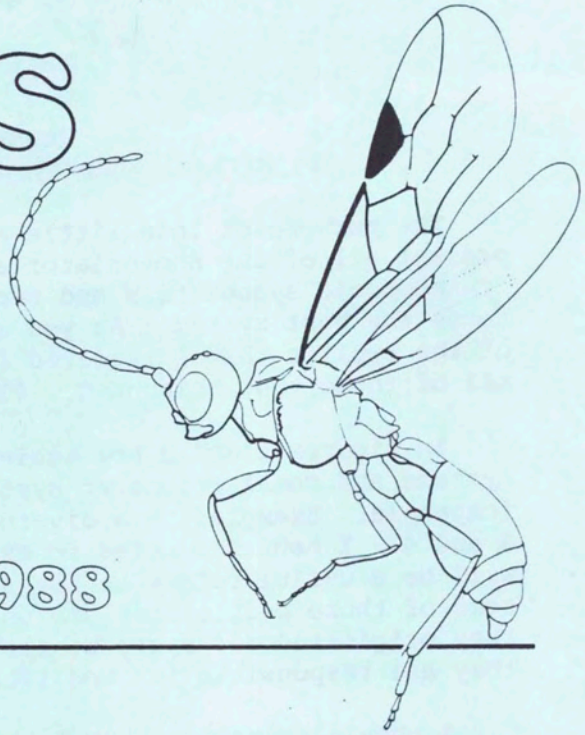
ICHNEWS



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EDITORIAL

This is getting ridiculous; here it is the end of 1988 and the 1987 Ichnews is just getting out. I'm not sure who to blame but if I can find anyone besides myself I'll let you know. I have enclosed with this issue the questionnaire for Ichnews 1988. The prompt return of this questionnaire should ensure that the next issue is published before March 1, 1988. Please return these to Paul Marsh before February 1, as he is the next editor.

Speaking about enigmas, I have a little quiz for our readers. To what family does the specimen illustrated above belong? Those who answer correctly will get the next two issues of ICHNEWS absolutely free.

We would like to know if there are any other topics that are of general interest to our readers. The questionnaire on wing venation nomenclature seemed to elicit a good response (thanks for the suggestion Bob Wharton), what next?

Many of us had the opportunity to meet this July in Vancouver on the occasion of the XVIII International Congress Of Entomology. Most agree that it was a success, especially those who found out about Wreck Beach! The Internation Society Of Hymenopterist's met and announced the new executive: President, (our own) Paul Marsh; Vice President, Z. Boucek; Secretary, J. Carpenter; Treasurer, G. Gibson. Readers will note that, once again an **ICHMAN** has been called upon to lead Hymenopterists out of the wilderness of their own confusion. Paul Marsh, as the president, will be trying to get the Hymenopterist's Journal off the ground. I believe that he is also trying to solicit support for an international meeting of Hymenopterists every four years, falling two years after each International Congress Of Entomology. Great idea Paul and good luck in getting the next issue of this newsletter out on time.

ICHNEUMONOID WING VENATION

by Michael Sharkey with much help from readers of ICHNEWS

The purpose of this little article is twofold; first I would like to present all of the nomenclatorial schemes that are in current use in ichneumonoid systematics and secondly I would like to present what I believe to be the best system. As you are all aware this article is the result of all of the replies that I recieved from the last questionnaire and I wish to thank all of those that responded. (There were many).

In figures 1 and 2 and tables 1 and 2, I have summarized some of the systems and combinations of systems that are presently being used by ichpeople. Examples of a diversity of these schemes are presented in figures 3 and 4. I have not tried to explain them or justify them but hopefully they will be a useful reference for all of you. I have named the systems after some of those people that are using them; this is not meant to infer that they originated the systems, although in some cases (no pun intended Kees) they are responsible for modifications.

I should point out that I had some difficulty reading some of the systems sent in, also the wing that I use here is not the same as the one that I handed out so there may be some errors in my extrapolation. I ask all interested readers to check for errors in this presentation and with your collective permission I would like to publish a modified version of this whole thing, when complete, in a journal with a larger audience.

Fig.1

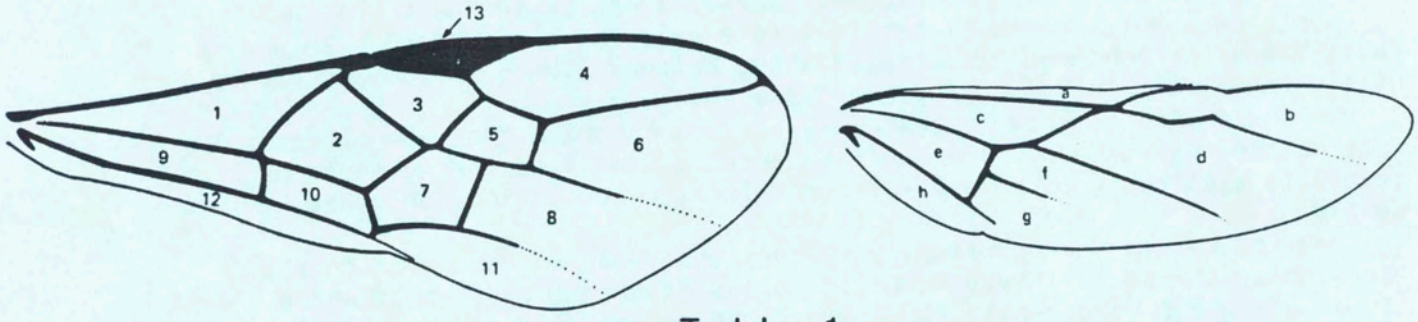


Table 1

Forewing

Van Achterberg		Rasnitsyn	Penteado Dias		Boucek acc Gardenfors	Tobias	Capek	Beyarslan	Tremblay & Pennachio
1 basal	B	1rm	Median	M	basal	medial	SCF 1	M	B
2 discal	D	1mcu	1st disoidal	D1	1st median	discoidal	MF 1	D1	1M
3 submarginal	SM	1+2r	cubital	C1	1st radial	1 radiomedial	RF1	CU1	1R
4 Marginal	M	3r	radial	R	pterostigmal	radial	PTF	R	Pterostigmal
5 submarginal	SM	2+3rm	2nd cubital	C2	2nd radial	2nd radiomedial	RF2	CU2	2R
6 submarginal	SM	4rm	3rd cubital	C3	3rd radial	3rd radiomedial	RF3	CU3	3R
7 discal	D	2mcu	2nd discoidal	D2	2nd median	-	MF2	D2	2M
8 discal	D	3mcu	3rd discoidal	D3	3rd median	-	MF3	D3	3M
9 subbasal	SB	1cua	submedial	SM	1st cubital	submedial	CF1	-	1CU
10 subdiscal	SD	2cua	1st brachial	B1	2nd cubital	brachial	CF2	B1	2CU
11 subdiscal	SD	3cua	-	-	3rd cubital	-	CF3	B2	3CU
12 plical	P	1a + 2a	anal	A	-	anal	AF	A	-
13 pterostigma	Pt	pterostigma	stigma		pterostigma	-	paf	-	pterostigma

Hind Wing

a costal	C	costal space	-		subcostal		COH	-	SC
b marginal	M	r	radiellan	RL	-	radial	PTH	R'	-
c basal	B	1rm	mediellan	ML	basal	medial	SCH	M'	B
d submarginal	SM	2rm	cubtellan	CL	-	-	RH	CU'	-
e subbasal	SB	1cua	submediellan	SML	-	submedial	CH1	SM'	-
f discal	D	mcu	discoidellan	DL	-	-	MH1	-	-
g subdiscal	SD	2cua	brachiellan	BL	-	-	CH2	-	-
h plical	P	a	anallan	AL	-	-	AH	A'	-

Fig.2

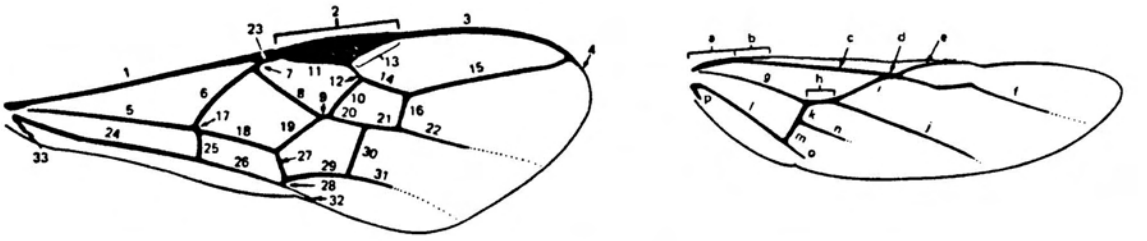


Table 2

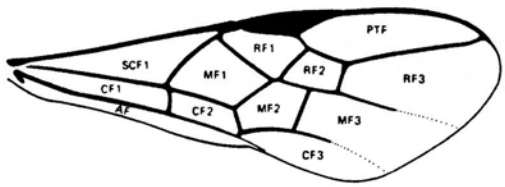
Other Systems (Veins)

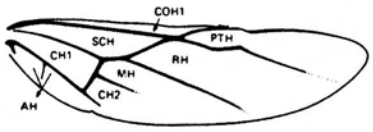
Fore Wing

	van Achterberg	Rasnitsyn	Penteado Dias	Boucek	Tobias	Capek	Beyarslan	Tremblay & Pennacchio
1	C+SC+R	C+R	c	C+Sc	C	cof + scof	c	C+Sc
2	pt	pt	stig	Pt	-	ptf	-	PT
3	1-Rl	Rl	met	Mc	met	mcf	mc	MC
4	2-Rl	Rl	-	-	-	-	-	-
5	M+CUl	M+Cu	m	Cul	MCu	cuf1	m	Cul
6	1-M	M	b	B	B	mcf1	b	B
7	1-SR	RS	-	-	-	-	-	-
8	1-SR+M	RS+M	cul	Ml	M	mcf1	cul	Ml
9	2-SR+M	RS+M	-	-	M	-	cu2	-
10	S-SR	RS	-	Irl	1r-m	rmf1	-	Irl
11	-	-	-	-	-	-	-	-
12	r	2r-rs	rl	Rl	R	raf1	rl	Rl
13	-	-	-	-	-	-	-	-
14	3-SR	RS	r2	R2	R	raf2	r2	R2
15	SRl	RS	r3	R3	R	raf3	r3	R3
16	r-m	3r-m	-	Ir2	2r-m	rmf2	-	Ir2
17	1-CUl	Cu	-	-	Cu	-	-	-
18	2-CUl	Cu	dl	Cu2	Cu	cuf2	dl	Cu2
19	1m-cu	1m-cu	n.rec.1	1m	1-rec	mcf2	-	Im2
20	2-M	M	cu2	M2	M	mcf2	cu3	M2
21	3-M	M	cu3	M3	M	mcf3	cu4	M3
22	4-M	M	cu4	M4	M	mcf4	cu5	M4
23	pa	pa	-	Pr	-	paf	-	-
24	1-1A	1A	sm	Al	A	anf1	sml	Al
25	cu-a	cu-a	n	Icl	nv	caf1	nv	Icl
26	2-1A	1A	sm	A2	A	anf2	sm2	A2
27	3-CUl	Cu	d2	-	-	caf2	n-rec	Cu3
28	CUlb	-	d3	Ic2	-	caf3	-	Ic2
29	1-CUla	Cu	n.par	Cu3	par	cuf3	s	Cu4
30	2m-cu	2m-cu	n.rec.2	-	2-rec	mcf3	-	Im2
31	2-CUla	Cu	n.par	Cu4	par	cuf4	s	Cu5
32	3-1A	1A	sm	A3	A	caf	sm3	A3
33	3A	2A	-	-	-	-	-	-

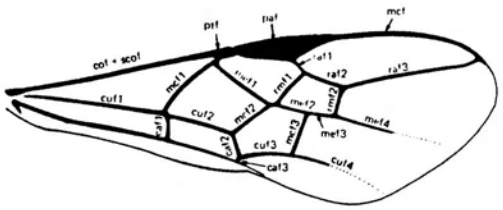
Hind wing

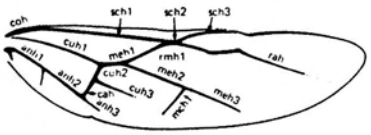
a	C+SC+R	C+R	-	Co-Sc	C	coh	c'	C+Sc
b	C	C	-	-	C	-	-	-
c	1-SC+R	R	subc	Scl	C	sch1	c'	Scl
d	2-SC+R	R	-	-	-	sch2	-	-
e	Rl	Rl	metl	Sc2	-	sch3	mc'	Sc2
f	SR	RS	rad	R	R	rah	r'	R
g	M+CU	M+Cu	medl	Cul	MCu	cuh1	m'1	Cul
h	1M	M	med2	-	-	meh1	b'	-
i	1r-m	1r-m	bas	B	B	rmh1	b'	B
j	2-M	M	cub	Cu2	Cu	meh2	cu'	Cu2
k	1-CU	Cu	-	-	-	cuh2	-	-
l	1-1A	1A	subm	-	A	anh1	sm'	Al
m	cu-a	cu-a	nv	-	nv	cah	-	Icl
n	2-CU	Cu	dis	-	2Cu	cuh3	-	-
o	3-1A	1A	brac	-	A	anh2	-	-
p	3A	2A	-	-	-	-	-	-



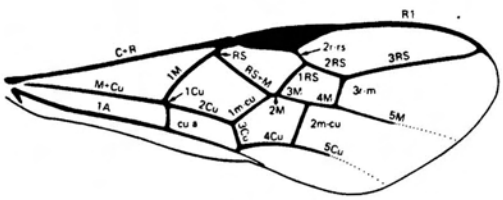


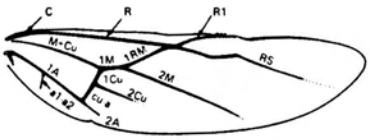
A. Capek, CELLS



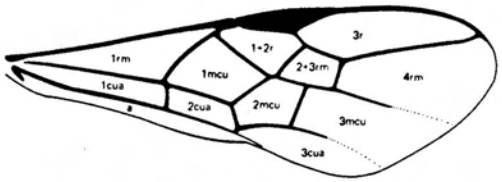


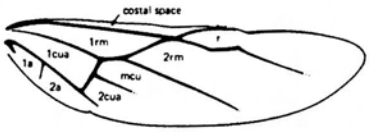
B. Capek, VEINS





C. Rasnitsyn, VEINS





D. Rasnitsyn, CELLS

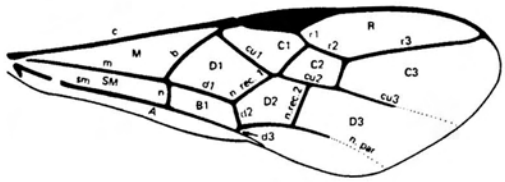
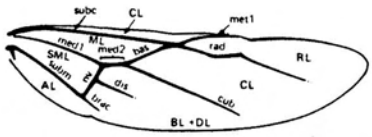
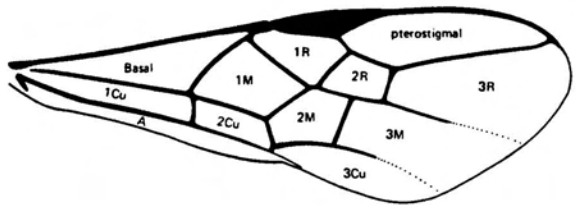


Fig.3

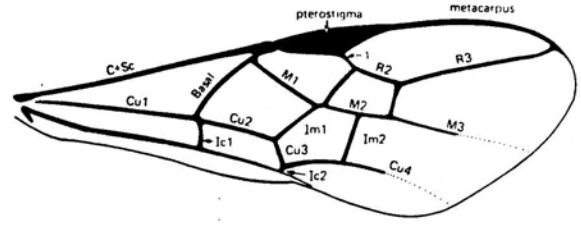


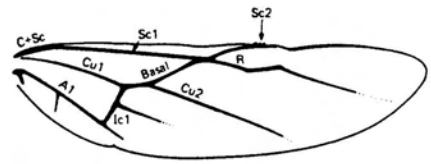
E. Penteado Dias, CELLS and VEINS

Fig.4

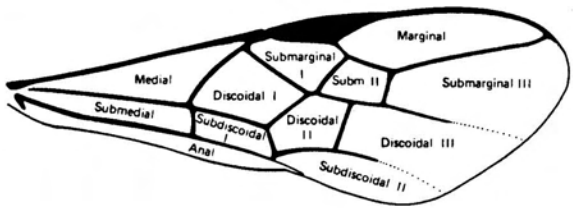


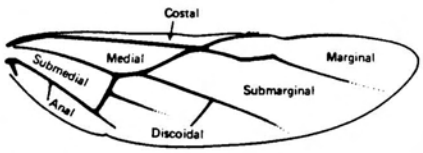
A. Trembley and Pennacchio, CELLS



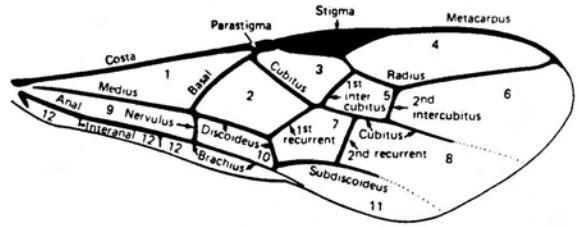


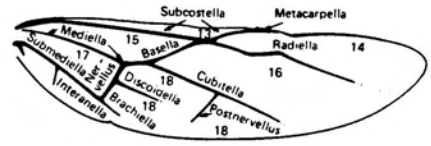
B. Trembley and Pennacchio, VEINS





C. Carpenter (Aculeata), CELLS





D. Marsh, CELLS, veins presented in table

Marsh, CELLS	
1. Medial	10. 1st brachial
2. 1st discoidal	11. 2nd brachial
3. 1st cubital	12. Anal
4. Radial	13. Costellan
5. 2nd cubital	14. Radiellan
6. 3rd cubital	15. Mediellan
7. 2nd discoidal	16. Mediellan
8. 3rd discoidal	17. Submediellan
9. Submedial	18. Discoidellan

Explanation of the Redtenbacher (Comstock-Needham) System

The system used here for naming wing veins is the Redtenbacher system, sometimes referred to as the Comstock-Needham system. Refer to figure 5 and 6 and table 3 for an illustration and explanation of the veins and figure 7 and table 4 for the cells described below. The Redtenbacher system recognizes six major veins. Starting from the costal (anterior) margin of the wing these are: costal vein (C), subcostal vein (Sc), radial vein (R), medial vein (M), cubital vein (Cu), and anal vein (A). Some of these veins are often missing in any one hymenoptera wing.

When a vein is branched the most anterior branch is usually given the postscript 1 and the more posterior branches 2, 3, etc. Thus the most anterior branch of the medial vein is M1 and the second most anterior is M2 etc.. This is true for all veins except the radial (R). When the radial vein branches, the most anterior branch is termed R1 as in most veins. However, the second branch of the radial vein is termed the radial sector (RS). Subsequent branches in the radial sector are named according to the general system, i.e., RS1 Radial Sector 1, RS2 Radial sector 2, etc.

A vein may have many abscissa (sections). These segments of a vein are delimited by the intersection of other veins, often cross veins. Thus a vein that is intersected by two veins will have three abscissa, if the two intersecting veins don't meet the vein at the same point. (Note that this often renders abscissae that have the same name non-homologous). If the cubital vein (Cu) has three abscissa they are referred to as follows, 1st Cu, 2nd Cu and 3rd Cu. The 1st Cu is the most proximal abscissa, these are abbreviated to 1-Cu, 2-Cu and 3-Cu. To my knowledge the dash between the number and the abbreviated vein was first used by Van Acterberg (in Tijdschrift Voor Entomologie, 122(7):241-479, 1979), and I find it a convenient way to remember that it refers to an abscissa and not a branch. It is also necessary when dealing with the nomenclature of the anal veins, more on that later.

As apparent from above, longitudinal veins are abbreviated in capital letters. Cross veins are also present on the wing and lower case letters are used to represent these. Cross veins take on the name of the veins that they connect. For example if a cross vein connects the radial (R) and the medial (M) veins it is abbreviated r-m. If there are several r-m crossveins they take on numerical values as well. The most proximal would be 1r-m and those further away from the body would be 2r-m, 3r-m, etc. If a cross vein joins two branches of the same vein, the crossvein simply takes on the name of the major longitudinal vein and is abbreviated in the lower casse. For example, a cross vein between R and RS is simply referred to as r.

Two veins may fuse and run parallel to each other thereby appearing as one vein. The resulting vein takes on the name of both component veins joined by a plus (+) sign. For example, in the Hymenoptera the radial sector (RS) and the medial vein (M) are often fused for portions of their lengths. This

composite vein is called Rs+M. Also, veins often fuse along the costal margin of the wing. For example, in the Ichneumonoidea the costal and radial veins fuse and are termed C+R.

QUIZ. If the radial vein is called the radius and the medial vein is called the medius, what is the corresponding term for the anal vein?

Two veins may also run into one another such that they appear as one vein (serial fusion). This is the case in all Ichneumonidae and many Braconidae that have lost 1-RS+M. In these groups it is often difficult to know where 1-RS and 1-M meet therefore the entire vein is referred to as 1-RS&1-M or simply RS&M since these two have serial fusion only once in any ichneumonoid wing. Note that the names of the two veins are joined by & to denote serial fusion instead of + which denotes lateral fusion.

Wing cells also have names though these are less used. Cells take the name of the vein lying anterior to them and are abbreviated using capital letters. If several fused veins form the anterior boundary of a cell, the cell takes the name of the vein that is theoretically most posterior. (This is equivalent to the last vein named in the series of letters composing the vein). For example, the cell posterior to C+R is the radial cell (R). There may be many cells lying directly behind any vein. In such cases the cells take on numerical values. If there are three medial cells (and the medial vein is not branched) the most proximal is 1-M, the next is 2-M, etc..

MY PROPOSAL FOR WING VEIN NOMENCLATURE IN THE ICHNEUMONOIDEA

See figures 5 and 6 and table 3 for cells and figure 7 and table 4 for veins.

Costal Vein. The costal vein runs along the fore (costal) margin of the wing. Basally (up to the stigma) it lies immediately anterior to the Radial vein such that the cell between them (C) has all but disappeared. The costal vein then runs along the fore margin of the stigma and at the apex of the stigma fuses with R1 (which forms the posterior margin of the stigma) to form C+R1. I prefer to abbreviate this to R1 as it is traditionally called. If one looks at the stigma of a xyelid or almost any ichneumonoid with light illuminating the stigma from below one clearly sees the costal vein as a thickening of the anterior margin of the stigma. Similarly the posterior margin of the stigma is thickened and this thick portion represents the first abscissa of R1.

Ross (1936) suggested that the costal vein ended before the stigma, presumably because in all Hymenoptera there is a break (bulla) at the base of the stigma. This break simply marks the point where a wing fold crosses the vein and as most of the other longitudinal veins have breaks it can't be considered evidence that the vein has terminated.

Despite all of the arguments presented above, for the purposes of stability and simplicity I prefer to name the various parts of the costal vein as follows: 1. <u>C+R</u> for the fused costal and radial veins basal to the stigma. 2. <u>Anterior margin of the stigma</u> for that portion of the costal vein

in said location. 3. Rl for the portion of the costal vein which is fused with Rl distad the stigma .

Subcostal Vein. As far as I can tell the subcostal vein is not present in the Ichneumonoidea. Some suggest that it has fused with the Costa or Radius or both and therefore they label the conglomeration of veins along the base of the fore margin of the front wing as C+Sc+R. There is no evidence in the Symphyta that Sc fused with either C or R. It is either present and relatively weak as in the Xyelidae or apparently completely absent. I suppose it is possible that it is fused to either C or R but why complicate the nomenclature when there is no evidence to support the idea anyway. For this reason I prefer to name the fused veins on the basal portion of the fore margin of the wing simply C+R.

Stigma. As mentioned earlier I believe this to be a cell that has "filled in" with sclerotized tissue. The costal vein forms the anterior margin and Rl forms the posterior margin. The stigma may therefore be referred to as 2-C or the 2nd costal cell (the first being greatly reduced but usually partly visible between C and R just basad the stigma). Of course, it seems best just to refer to it as the stigma or pterostigma as you wish. If any one doubts the 2-C origin of the stigma one need simply view the character in a number of Symphyta.

Radial Vein. The radial vein lies posterior to the costal vein and is more or less fused to it for most of its length. Basal to the stigma the radial vein branches. The anterior branch is Rl, which is roughly equivilant to that short, often swollen portion, basal to the stigma, which is refered to as the parastigma; Rl then forms the posterior border of the stigma. Distad the stigma, Rl fuses with C and forms C+Rl which for convenience and stability I prefer to call Rl.

The posterior branch is the Radial Sector. Primatively it has a short free abscissa before fusing with the medial vein to form 1-RS+M. Sometimes there is a short second section (2-Rs+M) and then RS bends anterad to form the anterior margin of the RS cells of which there are usually two (1-RS and 2-RS). Van Acterberg (1979) called the last abscissa of RS 'RS1'. The reason for this appears to be that in Xyelidae the radial sector branches into RS1 and RS2. Presumeably Van Acterberg believes this was not a synapormorphy for the Xyelidae but ground plan for the Hymenoptera. There are four explanations for what I call the last abscissa of RS (V.A's RS1): 1. RS1 was lost. 2. RS2 was lost. 3. RS1 and RS2 fused. 4. The formation of RS2 is a synapomorphy of the Xyelidae and not part of the ground plan of the Hymenoptera. Since there is little evidence to support any of these hypotheses I suggest that RS is the most neutral, simple and traditional term. One may suggest that certain Braconidae i.e. some Agathidinae have a second branch of the radial sector and this is evidence that the branch anterior to it is in fact RS1. Outgroup analysis clearly and unequivically demonstrates that what we see in the Agathidinae is a secondary vein not homologous with RS2.

Medial Vein. The medial vein is fused basally with the cubital vein forming M+Cu these then split with 1-M forming the anterior branch which passes anteriorly to meet RS. It then travels distally and then fuses to RS as RS+M, finally they split and M forms the posterior margin of the RS cells and the anterior margin of M cells.

Cubital Vein. The cubital vein is fused with the medial vein basally. It then splits from the medial vein and proceeds toward the wing margin without branching. The cubital vein shares two crossveins with the anal vein. There has been some unnecessary complication in the nomenclature of the cubital vein in the Hymenoptera, specifically the second cu-a crossvein has been called Culb and the portion of the cubital vein distal to this crossvein has been termed Cula. Mason (in prep) has examined the evidence to support this complicated system and has found it to be lacking. Perhaps the biggest piece of evidence suggesting that Culb is a crossvein is that it crosses the claval furrow and cubital veins do not cross this furrow in panorpoid fore wings (Wootton 1979). I therefore prefer to simplify the nomenclature referring to the cubital vein as unbranched with two cu-a crossveins. Mason (in prep) supplies much more evidence in favor of this terminology and I'll incorporate this in the next version pending publication of Bill's ideas.

Anal Vein. The ground plan for the Ichneumonoidea calls for two anal veins. These are not branches, rather they are two separate veins 1A and 2A. Note that there is not a dash between the vein number and the vein. This differentiates these numbers from those that denote vein abscissae (segments). There are sometimes one or two spurious veins in the fore wings of Braconidae but these are obviously secondarily derived, not being found in any other Apocrita. They will be discussed in the next section with all other secondary veins.

Figs.5&6

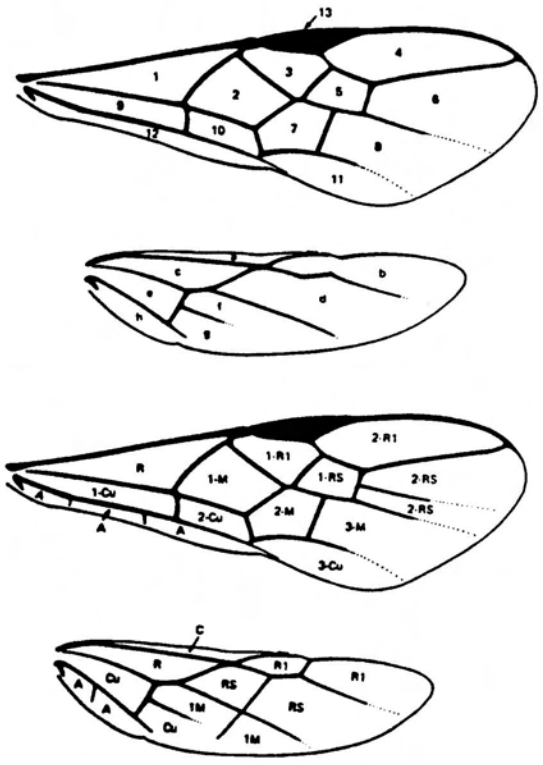


Table3

Complete Name	Cells: Suggested Name	Cells: Abbreviatio
Fore wing		
1. Radial	1. Radial	1. R
2. 1st Medial	2. 1st Medial	2. 1-M
3. 1st + 2nd Radial 1	3. 1st Radial 1	3. 1-Rl
4. 3rd Radial 1	4. 2nd Radial 1	4. 2-Rl
5. 1st + 2nd Radial Sector	5. 1st Radial Sector	5. 1-RS
6. 3rd Radial Sector	6. 2nd Radial Sector	6. 2-RS
7. 2nd Medial	7. 2nd Medial	7. 2-M
8. 3rd Medial	8. 3rd Medial	8. 3-M
9. 1st Cubital	9. 1st Cubital	9. 1-Cu
10. 2nd Cubital	10. 2nd Cubital	10. 2-Cu
11. 3rd Cubital	11. 3rd Cubital	11. 3-Cu
12. Anal	12. Anal	12. A
13. 2nd Costal	13. Stigma	13. Stigma
Hind wing		
a. Costal	a. Costal	a. C
b. Radial 1	b. Radial 1	b. Rl
c. Radial	c. Radial	c. R
d. 1st + 2nd Radial Sector	d. Radial Sector	d. RS
e. 1st Cubital	e. 1st Cubital	e. 1-Cu
f. Medial	f. Medial	f. M
g. 2nd Cubital	g. 2nd Cubital	g. 2-Cu
h. Anal	h. Anal	h. A

Fig.7

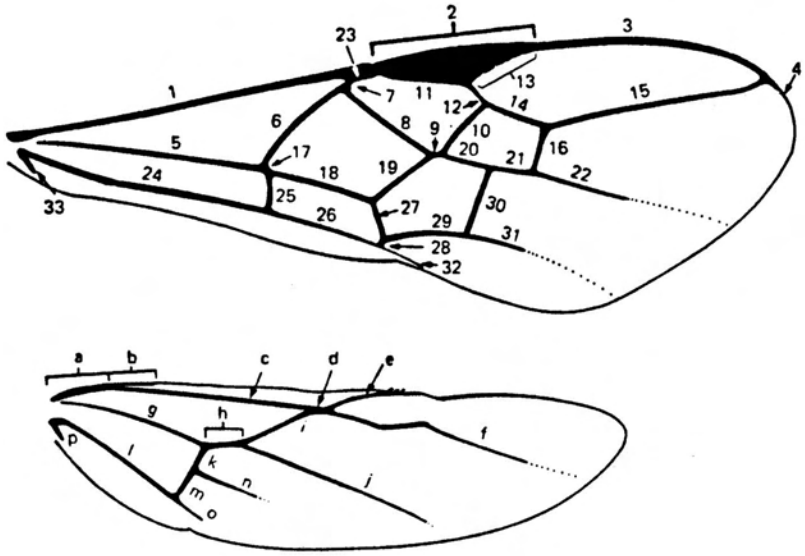


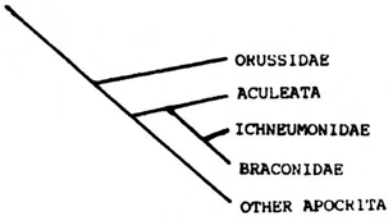
Table 4

	Complete Name	Suggested Name	Abbreviation
		Veins	
Fore wing			
1.	Costal + Subcostal + Radial	Costal	C
2.	Costal	anterior margin of stigma	-
3.	1st Costal + Radial 1	1-Radial 1	1-R1
4.	2nd Costal + Radial 1	2-Radial 1	2-R1
5.	Medial + Cubital	Medial + Cubital	M+Cu
6.	1st Medial	1st Medial	1-M
7.	1st Radial Sector	1st Radial Sector	1-RS
8.	1st Radial Sector + Medial	1st Radial Sector + Medial	1-RS+M
9.	2nd Radial Sector + Medial	2nd Radial Sector + Medial	2-RS+M
10.	2nd Radial Sector	2nd Radial Sector	2-RS
11.	2nd Radial 1	basal-posterior section of stigma	-
12.	2nd radial 1 - radial sector crossvein	radial crossvein	r
13.	3rd Radial 1	apical posterior section of stigma	-
14.	3rd & 4th Radial Sector	3rd Radial Sector	3-RS
15.	5th Radial Sector	4th Radial Sector	4-RS
16.	3rd radial-medial crossvein	radial-medial crossvein	r-m
17.	1st Cubital	1st Cubital	1-Cu
18.	2nd Cubital	2nd Cubital	2-Cu
19.	1st medial-cubital crossvein	1st medial-cubital crossvein	1m-cu
20.	2nd Medial	2nd Medial	2-M
21.	3rd Medial	3rd Medial	3-M
22.	4th Medial	4th Medial	4-M
23.	1st Radial 1	parastigma	-
24.	1st 1 Anal	1st 1 Anal	1-1A
25.	1st cubital-anal crossvein	1st cubital-anal crossvein	1cu-a
26.	2nd 1 anal	2nd 1 anal	2-1A
27.	3rd Cubital	3rd Cubital	3-Cu
28.	2nd cubital-anal crossvein	2nd cubital-anal crossvein	2cu-a
29.	4th Cubital	4th Cubital	4-Cu
30.	2nd medial-cubital crossvein	2nd medial-cubital crossvein	2m-cu
31.	5th Cubital	5th Cubital	5-Cu
32.	3rd 1 Anal	3rd 1 Anal	3-1A
33.	2 Anal	2 Anal	2-A
Hind wing			
a.	Costal + Subcostal + Radial	Costal + Subcostal + Radial	C+Sc+R
b.	Costa	Costa	C
c.	1st Radial	1st Radial	1-R
d.	2nd Radial	2nd Radius	2-R
e.	Radial 1	Radial 1	R1
f.	Radial Sector	Radial Sector	RS
g.	Medius + Cubital	Medial + Cubital	M+Cu
h.	1st Medial	1st Medial	1-M
i.	radial-medial crossvein	radial-medial crossvein	r-m
j.	2nd Medial	2nd Medial	2-M
k.	1st Cubital	1st Cubital	1-Cu
l.	1st 1 Anal	1st 1 Anal	1-1A
m.	cubital anal crossvein	cubital anal crossvein	cu a
n.	2nd Cubital	2nd Cubital	2-Cu
o.	2nd 1 Anal	2nd 1 Anal	2-1A
p.	2 Anal	2 Anal	2A

SPURIOUS, SECONDARY OR ADVENTITIOUS VEINS

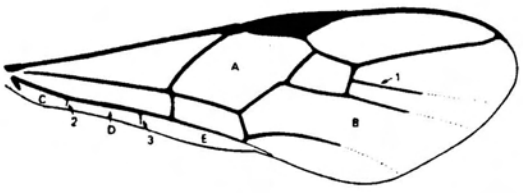
There are seven veins that are found in the Braconidae that are not found in the Ichneumonidae or the Aculeata or any other Apocrita. Given the phylogeny that can be extrapolated from Rasnitsyn (1988), presented in figure 8, then all of these veins are either secondary or they have been independently lost in four other groups viz. Orussidae, Aculeata, Ichneumonidae and all other Apocrita exclusive of the Aculeata and Ichneumonidae, hardly likely and certainly not the most parsimonious decision.

Fig.8



Given that these veins are not homologous with other veins what shall we name them? They could be given new names, but in my opinion this would be unnecessarily complicated. We could give them more or less traditional names, or finally, we could refer to them as secondary veins and describe them in terms of their location. I prefer the use of more or less traditional names for taxonomic descriptions but I am open to debate on this question.

Fig.9



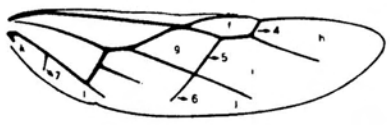


Table 5

Cells			
	Complete Name	Suggested Name	Abbreviation
Fore wing			
A	1st + 2nd Radial 1 + 1st Medial	Radial 1 + Medial	R1+M
B	2nd + 3rd Medial	2nd Medial	2M
C	Anal	1st Anal	1-A
D	Anal	2nd Anal	2-A
E	Anal	3rd Anal	3-A
Hind wing			
F	Radial 1	1st Radial 1	1-R1
G	Radial Sector	1st Radial Sector	1-RS
H	Radial 1	2nd Radial 1	2-R1
I	Radial Sector	2nd Radial Sector	2-RS
J	Medial	2nd Medial	2-M
K	Anal	1st Anal	1-A
L	Anal	2nd Anal	2-A
Veins			
Fore Wing			
1	Secondary vein	2nd Radial Sector	2-RS
2	Secondary vein	1st Anal crossvein	1a
3	Secondary vein	2nd Anal crossvein	2a
Hind wing			
4	Secondary vein	radial crossvein	r
5	Secondarys vein	2nd radial-medial crossvein	2r-m
6	Secondary vein	medial-cubital crossvein	m-cu
7	Secondary vein	anal crossvein	a

(REFER TO FIGURE 9 AND TABLE 5 TO AID IN THE UNDERSTANDING OF THE FOLLOWING ARGUMENTS)

Vein 1. RS2 could also be named a spurious vein on the r-m crossvein. It is widespread in the Agathidinae.

Veins 2. and 3. these could both be called spurious veins of 1A, vein 2 the basal spurious vein and vein 3 the apical spurious vein. I prefer to call them 1a and 2a respectively as this gives us some idea of their location and direction.

Vein 4. r of the hind wing is an adventitious crossvein between R1 and RS.

Vein 5. 2r-m is an adventitious crossvein between R and M of the hind wing. When present it is usually a small stub on RS.

Vein 6. This is a more complicated situation. It is my belief, though not a strong one that this vein is Cu2. It is found exclusively (except Dirrhope and Acampsis which have very weak indications of a fold or stub respectively) in the cyclostome clade of Braconidae (including the Dipterous parasitoids the Alysiinae and Opiinae). In these groups, what is traditionally thought of as Cu2 does not exist. I think that Cu2 has migrated distally in this clade to location 6 in figure 9. TThe same migration of Cu2 is common in the Aculeata. Van Acterberg (1979) and others have referred to this as the m-cu crossvein but such a crossvein is not present in the primary, secondary, tertiary or quaternary outgroups i.e. the Ichneumonidae, Aculeata, remaining Apocrita and Orussidae. Parallel losses would have to be assumed for each of these taxa for m-cu to be truly present in the Braconidae. The only other reasonable possibility is that this vein represents something completely new, an advantitious vein. There is reason to believe this because the angle (the same as that of a crossvein) is not consistent with the Cu2 theory. It also simplifies the nomenclature of the veins and cells in the area if we consider this to be an advantitious vein. In short, I'm really not sure what to call this vein and would like to have the opinion of the readers. I think that the logical choice is between Cu2 and spurious vein of M. As indirectly indicated earlier, calling it Cu2 complicates the vein nomenclature in the area i.e. 1-M becomes of 2-M+Cu and 2-M becomes 3-M+Cu and 3-M becomes 1-M so perhaps spurious vein of M is best. How about postnervellus?

Vein 7. A small vein, rarely found and surely spurious. I propose that it be called a.

REJOINDERS AT VARIOUS QUARTERS

David Wahl and Michael Sharkey

(With apologies to S. Løvtrup for plagiarizing his title)

The response to the invitation for comments on our speculations on ichneumonoid relationships was overwhelming -- all of four people. To those brave souls (Kees van Achterberg, Bill Mason, Scott Shaw, and Bob Wharton), we extend our thanks. Their individual responses will be dealt with below, but a few general confessions and comments are in order.

1) Characters 6, 13, and 14, which are autapomorphies of Ichneumonoidea, were unnecessary for the analysis and seemed to confuse and befuddle some.

2) The paragraph of commentary on character 9 (p. 5) was meant for character 10. Understandably, this caused some confusion.

3) Many of our arguements were aimed at an unpublished opinion of Bill Mason's that Apozyx and Agriotypus are sister-groups, and that this clade is the sister-group of Ichneumonidae + Braconidae. This is especially reflected in the discussion of character 5, regarding the fusion of tergum 1 and sternum 1. Mason believes this to be a strong point in his argument. The subject will be discussed below in more detail. Suffice it to say that two different states are represented here (contra Mason) and the widespread distribution of tergum 1- sternum 1 fusion in the superfamily reduces the reliability of this character. Our arguements would have been less confusing if our opinions concerning Mason's scenario had been made explicit.

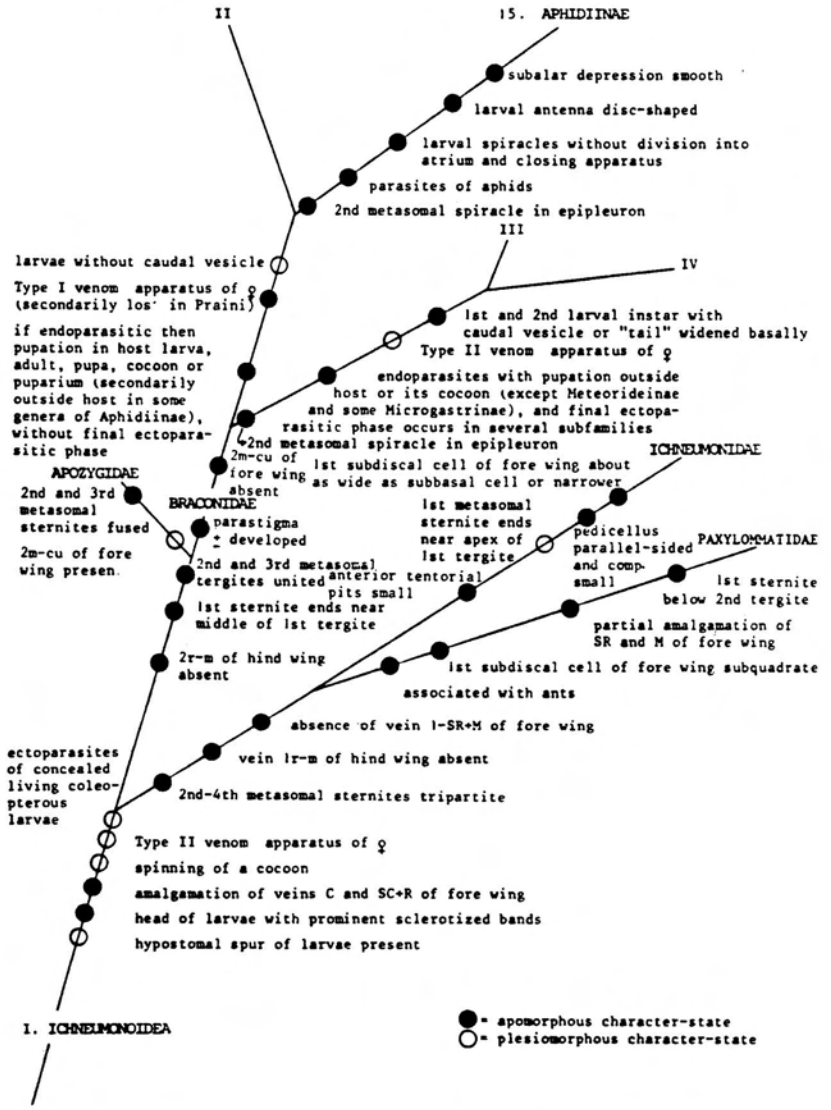
Bob (the priest) Wharton takes us to task for using character 5, as he well should. He also discusses problems with characters 8 (vein Rs+M) and 11 (2r-m of the hind wing). The latter will be discussed in Scott Shaw's section. As to the presence/absence of Rs+M in braconids, we realize that it is absent in many taxa, but overall distribution leads to the inescapable conclusion that it is part of the braconid ground-plan. Bob further notes ambiguity regarding our choice(s) of outgroup(s). To set the record straight, Aculeata was the primary outgroup (sister group), the remainder of the Apocrita was the secondary outgroup, the Orussidae was the tertiary outgroup, the Xyphidriidae was the quaternary outgroup and the Siricoidea was the final outgroup used. Refer to figure 9 of the previous article to visualize part of this cladogram. The use of multiple outgroups is sensible; see Madison, O'Donohugue, and Madison in Systematic Zoology 33:83-103 (1984).

Bob queried us regarding to what "2r-m" in the fore wing refers: "I find 2r-m defined in Richard's 1956 Handbook as the first intercubitus in the Ichneumonidae and the second intercubitus in the Braconidae. So this can't be right . . .should we assume the most distally placed r-m in (Borror, Delong and Triplehorn) is the 2r-m,? It is in some systems, but its 3r-m in others (see Eady 1974 and Ross 1936). So whose, modification of what system are you using? " Our logic was as follows: given the outgroups listed previously, Rs, 2r-m, and 3r-m are the intercubitals. We used Tanychora and braconids to establish vein identities. The outermost r-m is in the right place for 3r-m; there would seem to be little doubt that the first intercubital in both taxa is Rs. Aphidiines are interesting in how they demonstrate the distal shifting of Rs (see Marsh et al, Identification manual for the North American genera of the family Braconidae, figs. 418, 433-438; distal shifting of RS (and partial fusion with 2r-m) is seen in certain Aculeate groups e.g. Larrinae and Nyssoninae. We postulate that the shift of Rs occured in ichneumonids to form the characteristic areolet. We used the Ross system, not Richard's interpretation. On reexamination, it is simpler to refer to this crossvein as r-m since it is homologous in both Ichneumonids and Braconids and since it is the only r-m crossvein in the fore wing (see article in this issue on venation). On the other hand, 3r-m implicitly reveals to the reader our interpretation of the origin of this crossvein.

Kees van Achterberg writes: "It has surprised me too to see that some

colleagues still treat the Agriotypidae and Aphidiidae as separate families, when it is obvious that thet are subfamilies of the Ichneumonidae and Braconidae, respectively; otherwise, both become paraphyletic groups. That the morphology is a bit aberrant is easily understood from the aberrant biology, but the synapomorphies of the groups mentioned are present and clear. "Kees agrees that Hybrizon belongs in the ichneumonids, but believes that we advocate recognition of the Paxylommatidae, thus creating a paraphyletic Ichneumonidae. The layout of the diagrams are somewhat to blame but to avoid confusing other readers, we should point out that the last paragraph on p. 8 explicitly rejects familial status for Paxylommatinae (and Agriotypus, for that matter).

Fig.1



Kees goes on and cites his 1984 cladogram of ichneumonoid relationships (Fig. 1)(reproduced here with some characters and taxa that Kees added) as evidence of a sister-group relationship between Hybrizon and Ichneumonidae, justifying recognition on the former as a family. We disagree with many of his characters. While there is no conflict concerning the loss of 1-Rs+M, the use of tripartite metasomal sternites, and the supposed loss of vein 1r-m in the hind wing are not applicable, for reasons examined in dealing with Mason's arguments. And at least by our lights, his Ichneumonidea s.s. is not a justifiable natural group for the following reasons: 1) The character of 1M (first discoidal) cell about as wide as the 1Cu (subbasal) cell or narrower is found in numerous other taxa (Braconidae, Apozyx, Aculeata, Orussidae). The state found in Hybrizon would seem rather to be an autapomorhpy of that genus; one finds isolated ichneumonids with a similar condition. 2) The size of the anterior tentorial pits is quite variable in ichneumonids, with numerous instances of large pits. Due to its homoplastic nature, the utility of this character seems dubious. 3) The same comments apply to the use of the comparatively small and parallel-sided pedicel.

Although he cites it as a plesiomorphy of Ichneumonidae, having sternum 1 ending near the apex of tergum 1 is certainly not plesiomorphic within the Ichneumonidea. The plesiomorphic condition is what he cites as a synapomorphy of Bracomidae: sternum 1 ending near (or before) the middle of tergum 1. The "plesiomorphic" condition is a state that has evolved within the ichneumonoids on several different occasions. It should also be noted, in passing, that thepresence of a hypostomal spur is not a plesiomorphy of ichneumonoids, but rather a very strong synapomorphy for the superfamily.
In all, Ichneumonidae s.s. is not supported by the cited characters, and Hybrizon is best regarded as a subfamily of ichneumonids. The cited characters of Hybrizon are a combination of autapomorphies in the case of the subquadrate 1-M (first dicoidal) cell and parasitism of ants or synapomorphies shared with neorhacodines (partial fusion of Rs and M of fore wing).

Scot Shaw beamed his comments to us from the deck of the USS Schamarvard (Harvard). He states with regard to character 4 (metasomal sterna 2+3): "Basically, there are two possibilities: states 1 and 2 form a transformation series (1-2 or 2-1), which may be a synapomorphy for Apozyx + Agriotypus: or states 1 and 2 are independently derived, thus they represent only synapomorphies of their respective genera and are irrelevant to the analysis. Since none of the trees support a sister-group relationship between Apozyx and Agriotypus, it seems to me that the latter alternative is supported and the character can be rejected as useless at the level of interest. " We concur; nonetheless, we feel that the character should be included in the analysis because it is this analysis that demonstrates that the character is not relevent. We might further add that the different sexual expression of sternal fusion in the two genera (fused in both sexes in Apozyx, fused on in female Agriotypus) can be seen as further evidence that the two characters are not homologous.

Scott also finds fault with the coding of character 11 (2r-m in the hind

wing). His arguments involve both the absence of such a vein in the Aculeata (and our miscoding of it as present there, i.e. outgroup) and the assumption that veins are not easily regained. Given these premises, he further finds that the presence of 2r-m is relevant only within the braconids. We agree with this line of reasoning completely.

Scott ended his letter by saying that our idea "on lumping Hybrizon and Agriotypus in Icheumonidae sounds fine to me, but I think that you should go on to lump Apozyx into Bracomidae. The main point to be made, I think, is that studies of the larger families should include these oddball genera to see if they fit anywhere within Braconidae or Ichneumonidae. " Scott must be prescient or something, as findings since last year indicate that Apozyx is indeed a rogue braconid, a clyclostome as a matter of fact. The most parsimonious explanation of 2m-cu is that it is a reversal. Apozyx cannot be regarded as a seperate family, unless one believes in the reality of paraphyletic groups and similar fables.

Bill Mason had the most difficulty with our analysis; not surprisingly, since we question some of his character interpretations. Bill suggests, "posterior sternite 1 of (Apozyx and Agriotypus) is bipartite, which seems to argue against deriving Agriotypidae from a stem with tripartite sterna." This argument is somewhat vitiated by Bill, noting a few paragraphs later that sternite morphology is variable in ichneumonids, with single or bipartite sternites present as well. This is true, and our blind acceptance of tripartite sternites shows the danger of taking literature statements (Mason, W.R.M. 1981. Canadian Ent. 113: 428) at face value. We might further note that only Apozyx has a bipartite posterior sternite 1 -- the four species of Agriotypus that one of us (DBW) examined had only a single posterior section. While Bill thinks that there is some phylogenetic significance in the plate(s) being short and transverse-lenticular in Apozyx and Agriotypus, it would seem, rather, that having a strongly sclerotized synsternum 2-3 does not allow for much variation in the shape of the posterior half of sternum 1 except for rather restricted small and wide structures.

Bill states, "as far as I can see Apozyx, Agriotypus and Hybrizon all have fused T1 and S1 with the elements distinguishable (state 5-1). Of course this character and also 5-2 occurs frequently in braconids and ichneumonids, lowering its value. The conspicuous lateroventral carinae mark the boundary of T1, S1, especially clearly in Agriotypus . . . Also I don't understand why you use unordered characters states for 5." Our response: Careful inspection of Agriotypus reveals no trace of a T1-S1 suture. Only a prominent carina is present in the probable area and not differing from any of the other longitudinal carina on the first metasomal segment. This is very different form the Apozyx condition. The states were run unordered as we distinguished between a simple fusion that had the T1-S1 suture present (state 1 - Apozyx) and a structure without any trace of a suture (state 2 - Agriotypus), and felt that there was no *a priori* reason why 2 had to arise from 1. As we said before, widespread fusion of tergite 1 and sternite 1 throughout the superfamily considerably weakens the argument, and the only reason we included the character was due to Bill's ideas on phylogeny.

We differ with Bill on the interpretation of the r-m vein(s). While our treatments of outgroups was inconsistent, leading to confused thinking on character 11 (vein 2r-m), we have recanted and agree that 2r-m is absent in Aculeata (and the aculeate-ichneumonoid ancestor) and secondarily present in certain braconids. But what about Bill's hypothesis that ichneumonids have lost 1r-m and retained 2r-m, while braconids habe lost 2r-m and kept 1r-m? If one goes by the figure of Urocerus in Bill's 1981 publication (Canadian Ent. 113: 433-439) in which 1r-m is basad the Rl and Rs seperation, this would seem to be a reasonable interpretaton. This is further supported by his choice of Labena to illustrate the ichneumonoid condition: the r-m vein is far from the Rl and RS separation. But rigorous outgroup analysis shows that our interpretation has much more support. In the sister group of the Ichneumonoidea only one r-m vein is present and this is distal to the Rl and RS separation. The same condition is present in the other Apocrita, e.g. Trigonalidae. The tertiary and quaternary outgroups, the Orussidae and Xyphidriidae, also have the ichneumonoid condition of one distal r-m crossvein Looking at Symphyta, and siricoids in particular, it seems that Urocerus is the only siricoid with a r-m distad the separation of Rl and Rs. The vast majority of symphytes have 1r-m distad the separation, while a smaller number have it opposite (Sirex varies from opposite to distad). The outermost vein is 3r-m, not 2r-m. Thus the ground plan position of 1r-m appears to be distad the Rl and Rs seperation. The condition in Labena is very misleading, as it is a large ichneumonid and generally larger ichneumonids tend to have the r-m vein move distally. The typical condition in ichneumonids is to have r-m crossvein distad the Rl and RS separation by about its length. This is like the condition found in most outgroups (see fig 5, Protosirex , Mason 1981 op. cit.). The best interpretation of the situation is that 2r-m and 3r-m were lost in the ancestor of Orussidae + Apocrita; 1r-m stayed in the usual position in ichneumonids and all other apocritans except the braconids where it shifted to a position basad of the Rl and RS separation. Certain ichneumonids (Hybrizon and Neorhacodes, which are probably sister groups) have 1r-m opposite the Rl-RS separation, but not basad.

Bill commented on the morphology of the propodeum - tergum 1 connection. He notes that both Apozyx and Agriotypus have a modified, " conical -shaped keel on tergum 1, with no median fusion line and that the opening for ther tergo-propodeal tendon is directed longitudinally.

He finds this nowhere else in the aculeates and ichneumonoids, and interprets it as derived from the typical one (which has a median fusion line present and a dorso-ventral tendon opening). This is quite noteworthy, but when the bulk of other evidence is added, it seems to be an instance of parallelism. One wonders whether this is only a functional response to a heavily sclerotized metasoma and the various mechanical considerations involved in its manipulation.

ON THE PHYLOGENY OF THE ICHNEUMONOIDEA
(by D.R. Kasparyan)

In 1988 my paper on the Paxylommatidae from Baltic Amber will be published. Some of the apomorphies that are listed in this paper are also given here. Sometimes Paxylommatidae are considered as part of the Ichneumonidae, but from this family it differs in the following autoapomorphies:

1. Pterostigma and radial cell long and narrow.
2. Base of RS close to base of pterostigma.
3. First part of RS very short.
4. Venation of hind wing much reduced.
5. Thorax very short and high.
6. Coxae very long and not thickened anterobasally.
7. Wide postgenal bridge.
8. Mandible reduced.
9. Palps with reduced number of segments.
10. Second recurrent vein lacking.
11. Brachial cell very wide (in extant species).
12, 13 (Mason, 1981) antennal sensillae specialized.

Editor's Comment: Unquestionably, there are many characters to establish the fact that the Paxylommatinae are a monophyletic group, but I am not convinced by any of those characters that are supposed synapomorphies of the Ichneumonidae exclusive of the Paxylommatinae and therein lies the problem if one decides to elevate the Paxylommatinae to family rank.

Regarding "anyone, who can actually defend the usage of 'Aphidiidae'
By V. Tobias and P. Stary or P. Stary and V. Tobias
(they didn't specify)

Regarding the status of the aphidiids in the system of ichneumonoid parasitoids, we agree that they are related to braconids. There are such proofs as, venation of wings ("braconid type") in the Ephedrinae and the joining of tergites 2-3 of the abdomen. We could even agree that the 2nd recurrent vein in the fore wing dissappeared in the braconoid branch of the evolution of the Ichneumonoids after the fusion of terga 2-3 occurred. (This can be derived partially from cases of appearance of the 2nd recurrent vein in the braconids - Doryctinae; this has been dealt with in a special paper by TOBIAS & BELOKOBYLSKYI, 1983, Entomol. Obozr. 62:341-347. However, we do not see any reason to utilize the aforementioned situation for grouping aphidiids together with the braconids as a subfamily of that group. Excluding the Aphidiidae, all of the subfamilies of the Braconidae can directly, or through doubtlessly related subfamilies, be shown to be related with the most generalized (manifesting many plesiomorphic characters) subfamilies Doryctinae (ectoparasitic branch of braconids + Alysiinae + Opiinae) or Helconinae (endoparasitic branch). To relate aphiidiids to either of these branches causes unsolveable difficulities. Regarding biology, they may be derived only from the Euphorinae which include parasitoids of Hemimetabola. (This approach

was taken by M. Capek who found characters on the mouthparts of the final instar larvae supporting the hypothesis). However, the Euphorinae that parasitize the Hemimetabola are doublessly derived from Euphorines that parasitize Holometabola (beetles)and this relationship is demonstrated by many apomorphic characters in the wing venation. The ground plan biology of the Euphorinae is not one of attacking Hemimetabola. To derive the Aphidiinae from within the Euphorinae would mean that one would have to hypothisize the return of the whole complex of characters in wing venation (not of the particular veins, as demonstrated by TOBIAS in papers published in 1965, 1966, etc. but of all the venation similar to the "braconoid" type). This approach is far from logical. The characters that are similar within the larvae do not lend much support to the putative relationship because they are reductional features and, apparently, they are associated with decrease in body size and, possibly, with some similarity in the biology. Hence, endoparasitism of the aphids has developed independantly in the aphidiids, and very unlike the endoparasitism of the Euphorinae on hemimetabolous hosts. If this model of parasitism on aphids (through adult Hemimetabola) is used in reconstructing the evolutionary origin of the Aphidiidae then it is impossible to relate them either to the ectoparasitic or endoparasitic branches of the Braconidae especially since their most generalized representatives (those with the most plesiomorphic character states) parasitize hosts that live hidden within some substrate. To relate them with morphological characters is also unsuccessful as the similarity with braconid groups that share specialized wing venation are cases of convergence since the ground-plan of the Aphidiidae is obviously similar to that possessed by the Ephedrinae, a very primitive condition.

The logic of all this is that the aphidiids must be classified as the sister group of the braconids, as a group that originated after tergites 2-3 joined (despite the fact that this tendancy occurs also in some ichneumonids), and, apparently, independantly loosing the 2nd recurrent vein owing to a reducion in body size. (This may be observed in the smallest ichneumonids and, independantly, in the Paxylommatidae, which belong to the ichneumonid branch of the Ichneumonoidea). All this has been discussed in the 1965 - 1968 papers by TOBIAS; especially a 1968 paper published in "Tshtenija Pamyati N. A. Cholodkovsky".

Editor's note: At the request of the authors, I did some editing of their text. I am afraid that I may not have represented their ideas accurately. I look forward to hearing from all interested in this subject and if I have misrepresented the author's ideas I will clear it up in the next issue of Ichnews. Has anyone found a shared derived character for the Braconidae exclusive of the Aphidiinae?.....M. Sharkey

PUBLICATIONS OF THE AMERICAN ENTOMOLOGICAL INSTITUTE

Several readers have asked for information on the availability of some of the publications put out by the American Entomological Institute. So, what follows is a list of the publications that are available that are of direct interest to Ichpeople. Orders may be made through Dr. Henry Townes, American Entomological Institute, 3005 SW 56th Ave., Gainesville, Florida, 32608, U.S.A. Phone (904) 377-6458.

Dasch, C. E. 1964. Ichneumon-flies of America north of Mexico: 5 subfamily Diplazontinae. 305pp., 153 figs. Memoir 3.....$25.00

--------. 1971. Ichneumon-flies of America north of Mexico: 6 subfamily Mesochorinae. 376 pp., 462 figs. Memoir 16.....$40.00

--------. 1974. Neotropic Mesochorinae (Hymenoptera, Ichneumonidae) 509 pp., 702 figs.....$40.00

--------. 1979. Ichneumon-flies of America north of Mexico: 8. subfamily Cremastinae. 702 pp., 679 figs. Memoir 29.....$50.00

--------. 1984. Ichneumon-flies of America north of Mexico: 9. subfamilies Theriinae and Anomaloninae. 610 pp., 653 figs. Memoir 36.....$50.00

Gupta, V.K. 1987. The Ichneumonidae of the Indo-australian area (Hymenoptera). 1,210 pp. Memoir 41 (2 vols.).....$68.00

Porter, C. 1967. A revision of the South American species of *Trachysphyrus* (Hymenoptera, Ichneumonidae). 368pp., 148 figs. Memoir 10.....$25.00

Sanborne, M. 1984. A revision of the world species of *Sinophorus* Foerster (Ichneumonidae). 403 pp., 170figs. $31.50

Short, J. 1978. The final larval instars of the Ichneumonidae. 508 pp., 802 figs. Memoir 25.....$50.00

Townes, H. 1983. Revisions of twenty genera of Gelini (Ichneumonidae). 281 pp., 172 figs. Memoir 35.....$28.00

Townes, H. and S. Chiu. 1970. The indo-australian species of *Xanthopimpla* (Ichneumonidae). 372 pp., 465 figs. Memoir 14.....$30.00

Townes, H. The genera of Ichneumonidae
Part 1 (Ephialtinae to Agriotypinae). 300 pp., 135 figs., 1969. Memoir 11.....$30.00
Part 2 (Gelinae). 537 pp., 311 figs., 1970. Memoir 12.....$45.00
Part 3 (Lycorininae to Porizontinae). 307 pp., 185 figs., 1970 Memoir 13.....$30.00
Part 4 (Cremastinae to Diplasontinae). 372 pp., 217 figs., 1971 Memoir 17.....$35.00

Townes, H. *et al.*
Catalogues and reclassifications of the Ichneumonidae of the world
Indo-australian area. 552 pp., 1961. Memoir 1.....$35.00
Neotropic Region. 367 pp., 1966. Memoir 8.....$30.00
Ethiopean Region. 416 pp., 1973. Memoir 19.....$35.00

Townes, H. and M. Townes, 1978. Lissonotini and Banchini. 614 pp., 412 figs. Memoir 26.....$40.00

Townes, H. and V. Gupta. 1962. Ichneumon-flies of America north of Mexico: 4. subfamily Gelinae, tribe Hemigasterini. 305 pp., 116 figs. Memoir 2.....$30.00

Announcement

A new newsletter for Myrmecologists 'Notes from Underground' is being created. Those wishing to contribute or who know others that may be interested should get in touch with Mark W. Moffett, one of the co-editors, at the following address: Entomology Department, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts 02138, U.S.A..

Report on the Braconidae collection at the Bishop Museum in Hawaii

(M. Sharkey)

In January of 1988 I had the opportunity to visit the Bishop Museum. The collection consists of about 52,000 pinned Braconidae; about 2,000 of these are identified, usually to species, and all of the rest are miscellaneous Braconidae sorted to geographic regions. The approximate number of Braconidae from each geographic region is presented below. As you will note, the collection is particularly strong in material from South-East Asia, Papua New Guinea and the Pacific islands.

Much of the material is in poor condition and poorly mounted, however, the recent additions to the collection are in good shape.

I have pulled out all of the Agathidinae from the collection (only about 1,100 specimens or 2% of the Braconidae) and sorted them to genus. However, the remainder of the collection remains unsorted.

Anyone interested in seeing the collection should contact Dr. Gord Nisheda or Dr. Scott Miller at the following address:

Bishop Museum
1525 Bernice Street
P.O. Box 19000A
Honolulu, Hawaii 96817-0916
U.S.A.
Telephone (808) 848-4129

Number of braconid specimens as they are arranged in the Bishop Museum

Samoa	1,000	India-Nepal	500
Tonga	600	Puykyu Island	600
Fiji	1,500	Hong Kong	1,700
New Hebrides	1,000	Cambodia	100
New Caledonia	1,400	China	300

Soloman Islands	2,000	Laos	2,500
New Guinea	13,000	Thailand	2,300
Australia	1,000	Vietnam	3,400
New Zealand	300	Japan	300
Philippines	4,700	New World-Europe	1,000
Borneo	7,000	Hawaii	3,000
Indonesia	600	Taiwan	1,000
Malay Penninsula	800		

OBITUARY
CARL F. W. MUESEBECK

Carl F. W. Muesebeck, a U.S. Department of Agriculture research entomologist and research associate of the Smithsonian Institution who was a pioneer in the description of North American parasitic wasps, especially Braconidae, died of congestive heart failure, Nov. 13, in Schenectady, N.Y.. He was 93.

Mr Muesebeck. born in Medina, N.Y., graduated in 1916 from Cornell University in entomology and botony; he joined the USDA Bureau of Entomology, serving as a scientific assistant in biological studies before returning to Cornell on 1918 as an instructor in entomology.

From 1935-1954, Mr. Muesebeck was in charge of the USDA Division of Insect Identification in Washington, D.C.. One of the foremost authorities on Hymenoptera, Mr. Muesebeck was the author of more than 100 major scientific papers, including large revisions of the following braconid genera for America north of Mexico: Agathis, Apanteles, Bassus, Bracon, Macrocentrus, Meteorus, Microgaster and Orgilus. In 1951, the USDA awarded its distinguished service award to him.

Mr. Muesebeck was a member of the Entomological Society of America (president, 1946), Entomological Society of Washington (president, 1940, and honary president, 1971-1987), Biological Society of Washington, Society of Systematic Zoologists, Washington Academy of Sciences and Sigma Xi. He belonged to the Cosmos Club from 1936 to 1954.

Following his retirement in 1954, he continued his taxonomic research until 1980 as an honorary collaborator and research associate at the Smithsonian Institute. A resident of Hyattsville, Md., he moved to Schenectady in 1982. There are no immediate survivors.

GILBERT NIXON

As most of you are aware Dr. Nixon of the British Museum died in 1987. I have not recieved an obituary to include here but perhaps this will be included in the next newsletter.

COLLECTION AT THE AMERICAN ENTOMOLOGICAL INSTITUTE
by Henry Townes

The Hymenoptera at the American Entomological Institute were counted at the end of 1987. The numbers of ichneumonoid specimens are listed below, by subfamilies.

The nomenclature and taxonomy in the list of Braconidae is according to the recent Catalog of Hymenoptera North of Mexico, without any intention to endorse that system. In the Ichneumonidae, the subfamily nomenclature and taxonomy are according to my own preference.

APOZYGIDAE	2	ICHNEUMONIDAE	(558,821)
BRACONIDAE	(141,395)	Ephialtinae	28,054
Doryctinae	9,712	Tryphoninae	23,771
Braconinae	14,796	Eucerotinae	771
Exothecinae	2,722	Labiinae	1,794
Rogadinae	9,848	Adelognathinae	487
Meteridiinae	37	Xoridinae	2,079
Helconinae	4,430	Agriotipinae	4
Cercobarconinae	10	Gelinae	146,615
Zelinae	843	Lycorininae	347
Macrocentrinae	4,141	Neorhacodinae	8
Amicrocentrinae	6	Banchinae	25,621
Xiphozelinae	3	Scolobatinae	24,958
Agathidinae	9,367	Porizontinae	78,006
Opiinae	5,361	Cremastinae	11,349
Alysiinae	10,093	Phrudinae	668
Sigalphinae	140	Tersilochinae	5,382
Cheloninae	10,322	Ophioninae	14,796
Adeliinae	95	Mesochorinae	9,281
Microgastrinae	45,339	Metopiinae	14,449
Ichneutinae	621	Anomaloninae	2,489
Blacinae	5,234	Theriinae	7,228
Ypistocerinae	4	Acaenitinae	1,455
Neoneurinae	96	Helictinae	19,261
Euphorinae	8,080	Hybrzontinae	125
Mesostoinae	1	Orthopelmatinae	387
New Subfamilies	24	Collyriinae	89
		Orthocentrinae	18,346
APHIDIIDAE	(3,981)	Diplazontinae	12,073
		Ichneumoninae	81,032

The origins of these specimens are worldwide. Loans are made for revisional studies to workers with good reputations for returning specimens.

Specimens have been sorted to genus and are ready for loans. Requests for specimens may be made through Dr. Henry Townes, American Entomological Institute, 3005 SW 56th Ave., Gainesville, Florida, 32608, U.S.A. Phone (904) 377-6458.

WHAT'S HAPPENING

Note. Should probably be called 'What happened' since I'm so late with this thing.

C. van **ACHTERBERG** R.M.N.H., Postbus 9517; 2300 RA Leiden; Netherlands.
Papers in press: 1. Three new genera of Agathidinae. 2. World revision of Blacinae. 3. Revision of W. Palaearctic Phanerotomini. 4. Revisional notes on *Aspilota*.
Current projects: Together with Mark Shaw revising the W. Palaearctic spp. of *Aleidoes*. Reared specimens are welcomed; continuing work in the genera of the Braconidae and a revision of the Macrocentrinae. Kees also offers the following "I hope that there will be colleagual understanding that stability is still far from reached in the taxonomy of the Braconidae and that some change is accepted without interference of the International Commission on Zoological Nomenclature for every case."
Trips: Since 1987 Kees has twice been to Sabah collecting Braconidae with reasonable results. In 1989 he will go to Sulawesi again, this time to the S.E. leg.

Basant K. AGARWALA, Dept. of Life Science, Tripura University, Agartala, 799 004, India.
Papers in press: The host associations, biocontrol potential and distribution of *Trioxys indicus*.
Current projects: He is working on the parasitoid complex of *Cinara atrotibialis*.
Trips: Collecting in parts of North East Asia.

James C. ALLEN, Entomology Department, Comstock Hall, Cornell University, Ithaca, N.Y. 14853-0999, U.S.A.
Current projects: Presently he is a senior undergraduate student at Cornell University studying under W. Brown (ants). He is presently working on a large cooperative project on the chromosomes of the social wasps of the eastern U.S.A.
Trips: Travelled to Hawaii, New Zealand and Australia collecting Hymenoptera and visiting Museums.

Jesus Selfa ARLANDIS, Departamento de Biologia Animal, Biologia Celular, Genética y Parasitologia. Universidad de Valencia, Dr. Moliner, 50. 46100 Burjasot (Valencia), Spain.
Current Projects: Presently a graduate student revising the subfamily Ichneumoninae of Spain in colaboration with I. Izquierdo of the National Museum of Madrid. Would like to borrow Palearctic Ichneumoninae.

Dr. Andrew AUSTIN, Dept. of Entomology, Waite Agricultural Research Institute, University of Adelaide, Glen Osmond, S. Australia 5064.
Papers in press: Revision of the genus *Buluka* de Saeger (Hym: Brac.). Syst. Ent.; The Taxonomy of New World Microgastrine Braconidae Parasitic on *Diatraea* spp. (Pyralidae) (submitted to Bull. Ent. Res.).
Current projects: Revision of Australian *Apanteles s.str.* and *Dolichogenidea* (Braconidae); New species of *Opiuis* (Braconidae) parasitic

on the *Drosophila* spp. associated with bracken fern (*Pteridium esculatum*).
Trips: Museum trips to ANIC (February 1988) and the Brisbane (May 1988); 7 day collecting trip to dryland and rainforest habitats around Townsville, Q'ld. (May 1988); local collecting around Adelaide (October 1987 - March 1988).

Sergej A. BELOKOBYLSKY, Zoological Institute, Academy of Sciences, Leningrad, 199 034, U.S.S.R.
Current projects: Primary area of interest in the East Palaearctic, however, working on braconids in the subfamily Doryctinae (incl. Exothecinae) from the entire Palaearctic. He would be happy to receive specimens of this group from the south and south-eastern Palearctic.

Y. Ahmet BEYARSLAN, Trakya Universitesi, Fen-Ed. Fakultesi Biyologi Bolumu, 22030 Edirne, TURKIYE.
Current Projects: Interested in the braconid fauna of the Thrakien Region of Turkey.

M. CAPEK, Forest research Institute, 96923 Banska Stiavnica, Czechoslovakia.
Papers in press: 1. The status of the knowledge of Braconidae in Slovakia. 2. Braconidae as parasitoids of clearwings.
Current projects: Working on the parasitoids of tortricid defoliatiors of forest trees in Slovakia.

Liang-yih CHOU, Department of Entomology, Taiwan Agricultural Research Institute, 189 Chung-cheng Road, Wufeng, Taichung 41301, Taiwan, Republic of China.
Current projects: At present, I am studying the taxonomy of Agathidinae of Taiwan.

Carolina Doming Berta DE FERNANDEZ, Fundacion Miguel Lillo-Zoologia, Miguel Lillo 251, 4000 San Miguel de Tucuman, Argentina.
Current projects: Continuing work on her revision of neotropical *Cremnops* (Agathidinae).

Carmen Rey DEL CASTILLO, Museo Nacional de Ciencias Naturales (Entomologia), José Gutierrez Abascal no. 2, 28006 Madrid, Espana.
Papers in press: 1. The Glyptini of Spain; 2. The Banchinae of the Canary Islands; 3. A contribution to the knowledge of the Lissonotini in Spain: 4. genera *Alloplasta, Cryptopimpla* and new data on *Syzenctus*.
Current projects: Preparing a revision of the Palaearctic species of *Lissonota* of the subgenus *Loxonota* and would like to have specimens sent. Studying all species of *Lissonota* of Spain and the Canary Islands.

Thelma FINLAYSON, Centre for Pest Management, Department of Biological Sciences, Simon Fraser University, Burnaby, B.C., V5A 1S6.
Current projects: Taxonomy of final-instar larvae of Aphidiidae (Hymenoptera) Worldwide.

Ian GAULD, British Museum (N.H.), London, England.
Papers in press: 1. *Casinaria*, a paraphyletic genus with a revision of Australian species. 2. Revision of Mesoamencan Ophioninae. 3. The Evolution of parasitoid strategies in the Ichneumonoidea.
Current projects: 1. The Pimplinae, Labeninae, Anomalominae and *Cryptophion* of Costa Rica, welcomes reared material of these groups if they have complete host data. 2. The structure and composition of parasitoid faunas of tropical forests.
Trips: Costa Rica, Guanacoste National Park, late April-August.

Milka M. GLAVENDEKIC, Faculty of Forestry, 11030 Beograd, Yugoslavia.
Papers in press: Parasitoids of winter moths in Oak-Forests of Belgrade surroundings.
Current projects: Interested in European Ichneumonidae especially those of the Balkan Penninsula.
Trips: Collecting on Mount Durmitor and Mount Kopaonik.

V.Y. GOKHMAN, Plant Protection Division, Botanical Garden, Moscow State University, Moscow 119899, USSR.
Current projects: The revision of palaearctic *Baeosemus* and *Trachyarus* (Ichneumoninae); sending of the corresponding specimens will be gratefully acknowledged.
Current trips: Collecting trip to the Volgograd region during August 1988 in order to collect parasitic wasps, especially Ichneumoninae.

Erasimas HAESELBARTH, Univeristat Munchen, Lehrstahl fur angew, Zoologie, Amalrenstr. 52Gg., D-8000 Munchen 40.
Papers in press: 1. Zur Braconidengattung *Townesilitus*.

Klaus HORSTMANN, Zoologisches Institut, Rontgenring 10, D-8700 Wurzburg, W. Germany.
Current projects: 1. Revision of western Palaearctic Cryptinae with brachypterous females. 2. Revision of W. Palaearctic *Listrognathus* species and related genera. 3. Revision of some species groups of *Diadegma*. 4. Faunistic research of two small islands off the northern coast of Germany.

H.E. JUNHUA & Chen XUEXIN, Dept. of Plant Protection, Zhejiang Agricultural University, Hangzhou, Zhejiang, P.R. China
Current projects: Current projects include Megalyridae (*Ettchellsia*), Ichneumonidae (*Pseudopimpla, Pachyumelos, Brachyscleroma*) and Braconidae (*Aleiodes, Zele, Fornicia, Homolobus, Phamerotomella*) from China.

Kazuhiko KONISHI, Laboratory of Insect Systematics, Division of Entomology, National Institute of Agro-Environmental Sciences, Kannondai, Tsukuba, Ibaraki 305, Japan.
Current projects: Taxonomy of the genus Netelia of Japan; Taxonomy of the Aulacidae of Japan.

You LAN-SHAO (Insect Section; Hunan Agricultural College; People's Republic of China).

Current projects: Works on Braconid of Ghangxi Zhuang Autonomus Region with Mr. Zhou Zhi-hong (Guangxi Academy of Agricultural Science, Naning, Guangxi). Guangxi lies in the southeast of China, and is all in the subtropics. It is from 20°54' to 26°20' north latitude, from 104°29' to 112°04' east longitude. The Tropic of Cancer goes through its middle. In 1979-1981, a fairly big collection of braconid flies (amounting to 8000 specimens) were accumulated from 86 counties. Fifty species of Braconidae belonging to 8 subfamilies and 23 genera were examined, most of them are Oriental braconids.

Luc **LEBLANC**, Biology Department, Carleton University, Ottawa, Ontario K1S 5B6, Canada.
Current projects: 1. Revision of Nearctic species of Himerta. 2. General interest in Ctenopelmatinae.

John **LUMAN**, Dept. of Entomology, Univ. of California, Riverside, California, 92501.
Current projects: 1. Revisions of Amphibulus and Stilpnina (Ich., Gelini). 2. Catalog of Henrich types in Institute of Zoology, PAN, Warsaw, Poland. 3. Curating part of the University of Minnesota, St. Paul, Ich. collection. Those doing revisionary work of Nearctic groups should note that the collection has about 30,000 specimens of Ichneumonids (1/3 determined to species, mostly from Minnesota and environs, but with some from just about everywhere else.

Dr. Kaoru **MAETO**, Hokkaido Branch, Forestry and Forest Products Research Institute, Hitsujigaoka 1, Toyohira-ku, Sapporo 004, JAPAN
Current projects: Microgastrinae and Doryctinae from Japan, Far East and Oriental Region; braconid parasitoids of *Asphonclylia* spp. (Dip., Cecidomyiidae). Would like to examine any braconid specimens reared from Cecidomyiidae; Braconid fauna of Krakatau Islands.

Dr. **W.R.M. MASON**, Biosystematics Research Centre, Agriculture Canada, Ottawa, Ontario Canada K1A 0C6
Current projects: Phylogeny of Hymenoptera followed by Phylogeny of Braconidae.

Paul **MARSH**, USDA, c/o National Museum of Natural History, Washington, D.C. 20560 U.S.A.
Current projects: 1. Revision of Nearctic *Rogas* (with S. Shaw). 2. Revision of Nearctic *Heterospilus*. 3. Study of Braconidae of Bermuda (any material from Bermuda welcomed). 4. Study of several biotypes of the gypsy moth parasitoid *Cotesia melanoscelus*.

André Maurice **MOUSSA**, 9 cours de la Liberation, 38 100 Grenoble, France
Current projects: Ichneumonidae - Palearctic.

F. **PENNACCHIO**, Dipartimento di Entomologia e Zoologia agraria, Universita di Napoli 80055 Portici (ITALIA).
Current projects: Revision of palaearctic *Aphidius*. Specimens on loan or exchange eagerly desired.

Angelica Maria PENTEADO-DIAS, Universidade Federal de Sao Carlos, Departamento de Ciencias Biologicas, C.P. 676, Rodovia Washington Luiz, Km 235, 13560 - Sao Carlos-SP, Brazil.
Current projects: Interested in Neotropical fauna of the following taxa: Microgastrinae, Cheloninae, Braconinae and Aphidiinae, also interested in neotropical Bethylidae and would like to borrow specimens of this family.

Dr. Donald L.J. QUICKE, Department of Animal Biology, University of Sheffield, Sheffield S10 2TN, ENGLAND
Papers in press: *Digonogastra* Viereck, the correct name for Nearctic *Iphiaulax* of Authors. Proc. Ent. Soc. Wash. 90: 196-200; A new genus and species of Braconinae (Hymenoptera: Braconidae) parasitic on *Diatraea* (Lepidoptera: Pyralidae) in Ecuador. Bull. Ent. Res. 78: 15-18; The higher classification, zoogeography and biology of the Braconinae. In: Advances in parasitic Hymenoptera. (V.K. Compta, Ed.); The division of *Calcaribracon* Quicke (Hym., Braconidae) and the description of three new species. Entomologist's monthly Mag; A new genus and species of Braconinae from Australia (Insecta, Hymenoptera, Braconidae). Zool. Scripta; Reclassification of some Braconinae described by Fabricius (Hym., Braconidae). Entomologist's monthly Mag; Reclassification of some Neotropical Braconinae (Hym., Braconidae). Entomologist's monthly Mag; Four new genera of the *Plesiobracon* Cameron group (Insecta, Hymenoptera, Braconinae). Zool. Scripta; Inter-generic variation in the male genitalia of the Braconinae (Insecta, Hymenoptera, Braconidae). Zool. Scripta; A new Neotropical genus and species of Coeloidini (Hymen., Braconidae, Braconinae). Entomologist's monthly Mag; A new genus and species of Adeshini (Hym., Braconidae, Braconinae) from Thailand. Entomologist's mon. Mag; Two new genera and species of Braconinae (Insecta, Hymenoptera, Braconidae) from Branei. Zool. Scripta; A new Indo-Australian genus of Braconinae (Hym., Braconidae) parasitic on Hispidae (Col.). Ent. monthly Mag (with A. Walker); New host records for genera and species of Braconinae (Hym. Braconidae). Entomologist's monthly Mag.
Current projects: Revision of world genera of Braconinae; Revision of W. Palaearctic *Bracon*; Metasomal scent glands of Braconinae; Higher classification of the Braconidae; Biology of the Braconinae.
Trips: In 1987 visited the CNC, Ottawa, the MCZ, Boston and the USNM, Washington D.C. At each Institution sorted their entire collections of Braconinae to genus. In 1988 will visit the Museum fur Natuurkunde, Berlin, and the major entomological collections of E. Australia to sort their collections.

A.P. RASNITSYN, Paleontological Institute, U.S.S.R. Academy of Sciences, Profsoyuznaya str. 113, U.S.S.R. 117868 Moscow.
Papers in press: (With M. Sharkey) New Eoichnemmidae from Early Cretaceous of Siberia and Mongolia.

Matthias RIEDEL, Dept. of Physiology, University of Texas, Southwestern Medical School, 5323 Harry Hines Blvd., Dallas, Texas 75235 U.S.A.
Current projects: Ichneumonidae of Western Palearctic region, now starting to collect Texanian Ichneumonidae.
Trips: Current museum trip: Dept. of Zoology, Zoologic. Museum, Hamburg, FRG

Christine ROLLARD, Laboratoire d'Entomologie fondamentale et appliquée, Campus de Beaulieu, Avenue du g'Leclerc, 35042 Rennes cedex France.
Papers in press: Revision preliminaire de *Gelis* Thunberg, 1827, arachnophages et entomolophages.

David ROSEN, Dept. of Entomology, Faculty of Agriculture, P.O. Box 12, Rehouot 76100, Israel.
Current projects: Finalizing a series of papers on the Aphidiidae of Israel in collaboration with E. Mescheloff.

G. van ROSSEM, Berkenlaan 25, 6711 RM EDE, The Netherlands.
Current projects: Revision of Palaearctic Oxytorinae, "specimens can be sent (not too many)".
Trips: Collecting trip to Pyrenees (France).

Enrique RUIZ C., Tordillo 2308, Frace. Valle del Huajuco, Monterray, Nuevo Leon, 64820, México.
Current projects: 1. Ichneumonidae and Braconidae in Tamaulipas and Neuvo Leon. 2. Has amassed the Ichneumonidae collection from 13 different Mexican museums with 185 genera identified.
Trips: Collecting trip to diverse places in Nuevo Leon and Tamaulipas.

Michael SANBORNE, Lyman Entomological Museum, Macdonald College, 21 111 Lakeshore Rd., Ste. Anne de Bellevue, P.Q. Canada, H9X 1C0.
Current projects: 1. Revision of Nearctic species of *Campoplex* (Ichneumonidae) - specimens are still being accepted for the revision). 2. Revision of *Sinophorus*. Supp. #1. 3. Revision of *Cymodasa* Supp. #1. 4. Revision of *Cymodusopsis*. Supp. #1.
Trips: 1. Collecting in Venezuela, Dec. 87-Jan. 88, Rancho Grande, Rio Caura, Guri, Manteco, Gran Sabara. 2. Collecting in Burkina Faso (May-June 1988) with second trip in Aug.-Sept.

Santiago Bordera SANJAUN, Departamento de Biologia Animal, Biologia Celular, Genética y Parasitologia. Universidad de Valencia, Dr. Moliner, 50. 46100 Burjasot (Valencia), Spain.
Current Projects: A graduate student interested in the taxonomy of Western Palearctic Ichneumonidae, especially those of the Iberian Peninsula. Recently completed the Ophioninae of Spain and plans to begin work on the Gelinae of Spain and, with I. Izquierdo of the National Museum of Madrid to revise the Spanish species of Netelia. Would like to borrow palearctic specimens of Gelinae and Netelia.
Micheal SARAZIN, Biosystematics Research Centre, Central Experimental Farm, Ottawa, Ont. Canada K1A 0C6.
Current projects: Incorporation and rearing of parasites and predators for biocontrol project in Canada.

Martin SCHWARZ, Institut fur Zoologie, Hellbrunnerstr. 34, A-5020 Salzburg, Austria
Papers in press: Die europaischen Arten der Gattung *Idiolispa* Forster (Hymenoptera, Ichneumonidae). - Linzer biol. Beitr.

Current projects: Type studies of Cryptinae (= Phygadeuontinae) from the western palearctic region; revision of *Agrothereutes* and of allied genera. A revision of the genus *Gelis* in Europe is planned. Also working on the distribution of Cryptinae in Austria.
Identification: Yes, Cryptinae from the western palearctic region.
Help: New literature about Ichneumonidae.
Trips: In March 1988 made a collecting trip to Egypt.

Mark R. SHAW, Dept. of Natural History, National Museum of Scotland, Chambers Street, Edinburgh, EH1 1JF, Scotland.
Papers in press: *Pimplina* Ichneumon-flies (Hymenoptera, Ichneumonidae (Pimplinae)). Handbk. Ident. Br. Insects (with M.G. Fitton and I.D. Gauld); Parasitoids of European butterflies and their study. In Kudona, O. (ed.) Butterflies of Europe, Vol. 2. Aula-Verlag, Wiesbade; *Meteorus brevicauda* Thomson (Hymenoptera: Braconidae) reared from larvae of *Zengophora subspinosa* (Fabricius) (Coleoptera: Chrysomelidae). Entomologist's Gaz; The biology, egg & larvae of *Acaenitus dubutator* (Panzer) (Hymenoptera: Acaenitinae). Syst. Ent. (with D.B. Wahl); *Spathius cervicaudis* Ratzeburg (Hym.: Braconidae) new to Britain and parasitising *Agrilus ponnonic* (Piller & Mittepacher) (Col.: Buprestidae).
Current projects: 1. Biology and host association of W. European Ichneumonoidea - general. 2. Revision of W. Palearctic *Aleiodes* (with Kees van Acterberg) - would like to see as much material as possible, especially reared specimens. 3. Introductory handbook to British Braconidae (with Tom Huddleston).

P. STARY, Institute of Entomology, Czechoslovak Academy of Sciences, Branisovska 31, 370 05 Ceské Budejovice, CZECHOSLOVAKIA.
Current projects: 1. *Nothofagus* fauna: Parasitoids of aphids. 2. *Diuraphis noxia*: parasitoids - world. 3. Biocontrol of aphids by parasitoids in Burundi, E. Africa. 4. Parasitoids (Aphidiidae) of aphids: (N&S) Korea.
Trips: Burundi, East Africa.

P.K. SUMODAN, Department of Zoology, University of Calicut 673 635, Kerala, India.
Current projects: Working on "Braconid fauna of Kerala" for Ph.D. thesis of Calicut University (Kerala, India). Kerala State belongs to the south west of Penisular India. It lies west to the great western ghats. It has a very interesting fauna and flora. Would like to have examples of authentically determined specimens of the species already recorded from India and similar geographic regions on loan.

Camille THIRION, Zoologie générale et faunistique, Faculté des Sciences agronomiques, B-5800 Gembleux, BELGIQUE
Papers in press: 1. Diplazontinae Belgique et regions voisines. 2. Hymenoptera - Ichneumonidae, Ichneumoninae, Cratichneumon Belgique et Nord de la France.
Current projects: West-Palearctic.
Trips: Collection Institute royal Sciences naturelles Belgique, Bruxelles,

Belgique; Collection Faculté Sciences Agronomiques, Gemblaux, Belgique; Collection Université de Liège, Belgique.

Henry TOWNES, 3005 SW 56th Ave., Gainesville, FL 32608, U.S.A.
Papers in press: *Cryptus* Fabricius (Insecta, Hymenoptera), protest against conservation. Biol. Zool. Nomenclature.
Current projects: Tryphonini and Eclytini of America north of Mexico. Not borrowing additional specimens.
Trips: Collecting in Texas, May, 1988.

E. TREMBLAY, Dipartimento di Entomologia e Zoologia agraria, Universita di Napoli 80055 Portici (ITALIA).
Current projects: Revision of palaearctic *Aphidius*. Specimens on loan or exchange eagerly desired.

D.B.(Bif) WAHL , American Entomological Institute, 3005 SW 56th Ave., Gainesville, FL 32608, U.S.A.
Current projects: Generic revision of world Alomyini (Ichneumoninae); Revision of world *Benjaminia* (Campopleginae) - just finished; Larvae of Diplatontinae - new completion; Ichneumonidae section of CNC Hymenoptera Manual, incl. subfamily key for Holarctic & Neotropic; Major lineoges within Campopleginae, including relationships of Rhomphoctena and related genera; Phylogenetics of Ichneumonoidea (w/M.J. Sharkey).
Trips: lst 3 weeks of April 1988 in England (BMNH) incl. Germany (visiting Horstmann & Diller) in connection w/alomyine revision; Running Malaise traps in Florida, California and Costa Rica; Will be collecting in Costa Rica & Hawaii in conjunction of USDA/Univ. of Maryland Parasitic Hymenoptera Identification Course.

Annette K. WALKER, CAB Interntional Institute of Entomology, 56 Queen's Gate, London SW7 5BD, England.
Current projects: Identification of Braconidae & Ichneumonidae of the Afrotropical, Indooriental, Australasian and Pacific regions. Will identify insects of importance to agriculture, horticulture and forestry from these regions. Current interests in *Cardiochiles*, Cheloninae and Microgasterinae.

R.A. WHARTON, Dept. of Entomology, Texas A&M University, College Station, Texas 77843, U.S.A.
Papers in press: Classification of the braconid subfamily Opiinae (Hymenoptera). Can. Ent. 120: 28 pp.; A new species of *Bracon* (Hymenoptera, Braconidae) parasitic on *Eoreuma loftini* (Dyar) (Lepidoptera, Pyralidae). Proc. Ent. Soc. Wash. 90(3).
Current projects: Finishing a world revision of *Alysia*; Working on opiine genera and their interrelationships; Studying host specificity in several alysiines and opiines; Basic behavioral work on opiines, braconines, and alysiines, including both field work (oviposition) and lab studies (esp. on gland functions); Long-term project on world genera of Alysiinae (not much progress of late); Isolated species descriptions for biological studies by other researchers actually seems to take up most of my time!

James B. WHITFIELD, c/o Dept. of Biology, Washington University, St. Louis, MO 63130, U.S.A.
Papers in press: Revision of the Nearctic species of the genus *Stiropius* Cameron (= *Bucculatriplex* Auct.) with the description of a new related genus (Hymenoptera: Braconidae). Syst. Entomol. 13.; Patterns in host ranges within the Nearctic species of the parasitoid genus *Pholetesor* Mason (Hymenoptera: Braconidae). Environ. Entomol. 17 (with D.L. Wagner); Two new species of *Paradelius* (Hymenoptera: Braconidae) from North America with biological notes. Pan-Pac. Entomol.
Current projects: Reclassification of tribes of Rogadinae on world level. (No more specimens, please.); Phylogeny of biological aspects of Endoparasitism (Rogadinae, Microgastrinae). (No specimens, please, but any papers relevant to this topic would be welcome). A new interest in this area is parasitoid/symbiotic virus coevolution; Revisions of New World: a) *Stiropius* Cameron, b) *Polystenidea* Viereck, c) Two new related genera (no new specimens unless from Chile/Peru/Ecuador).
Current trips: Was married in May 1988 to Sydney A. Cameron, a specialist on social bees and wasps. They are likely to be taking several trips to various areas of Mexico in pursuit of bumble bees for a molecular systematic study; I will no doubt bring back Ichneumonoidea as well!

Daryl J.M. WILLIAMS, Dept. of Entomology, University of Alberta, Edmonton, Alberta, Canada, T6G 2E3
Papers in press: Classification, Phylogeny and zoogeographic studies of species of *Sathon* Mason (Hymenoptera: Braconidae). Questiones Entomologicae.
Current projects: Currently working on a revision of *Pseudognaptodon* Fischer. The basic specimen-handling stage is more or less finished and is mostly engaged in writing up keys, descriptions, etc. and attempting a phylogenetic analysis which is proving difficult.

C.F. ZWAKHALS, Onderweg 19, NL 4241 XD Arkel, The Netherlands.
Current projects: Palearctic Ichneumoninae, Pimplinae, Diplazontinae.

Publications for 1987

Abbott, B.D. and D.S. Grosch. 1987. Antennal Bud Development in *Bracon Hebetor* (Hymenoptera: Braconidae) by light and electron microscopy during the third and fourth instars. Ann. Entomol. Soc. Am., Vol. 80(3): 353-360.

Achterberg, C. van. 1987. *Coeloides* Wesmael, 1838 (Insecta, Hym.): proposed designation of *Coeloides scolyticida* Wesmael, 1838 as type species. Bull. zool. Nom. 44(2): 105-106.

Achterberg, C. van. 1987. *Disophrys* Foerster, 1862 (Insecta, Hym.): proposed designation of *Agathis caesa* Klug, 1835 as type species. Bull. zool. Nom. 44(2): 105-106.

Achterberg, C. van. 1987. The identify of *Acantholyda populi* auct. (Hym., Pamphiliidae). Ent. Ber., Amst. 48: 162-164.

Achterberg, C. van. 1987. *Chelonus* Panzer, 1806 (Insecta, Hym.) and *Anomala* Samouelle (Insecta, Col.): proposed conservation. Bull. zool.

Nom. 44(3): 172-173.
Achterberg, C. van. 1987. Revision of the European Helconii (Hymenoptera: Braconidae: Helconinae). Zool. Meded. (Leiden), Vol.. 61(18): 263-285.
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Arrigoni, de B., R.A. Zucchi and C. van Achterberg. 1987. Parasitoides (Hym., Braconide, Opiine) de Moscas-das-frutas do genero Ananastrepha (Dipt., Tephritidae). Resumos (2) + 1. Congresso Brasilieiro de Entomologia: 496.
Austin, A.D. 1987. Braconidae: A review of Braconidae (Hymenoptera) that parasitize Limacodidae in South-east Asia, particularly those associated with coconut and oil palm. Slug and Nattle Caterpillars. The Biology and Control of the Limacodidae of Economic Importance on Palms of S.E. Asia. Pp. 139-164.
Babidorich, M.M. and A.A. Sharov. 1987. Association of the seasonal cycles of codling moth *Laspeyresia pomonella* L. (Lepidoptera: Tortricidae) and its parasites in Moldavia, USSR. Entomol. Rev. (Engl. Transl. Entomol. Obozr.), Vol. 66(1): 96-105.
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Belokobylskij, S.A. 1987. A new genus in the subfamily Cardiochilinae (Hymenoptera: Braconidae) from the Soviet Far East USSR. Zool. Zh., Vol. 66(2): 302-304.
Belokobylskij, S.A. 1987. The male genetalia of braconids subfamily Doryctinae (Hymenoptera: Braconidae), its evolution and importance for classification of this group. Proc. All-Union Entomol. Soc.,, Vol. 69: 209-219.
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Belokobylskij, S.A. 1987. To the determination of the braconid wasps of the genus *Streblocera* Westw. (Hymenoptera: Braconidae) from the southern Soviet Far East. Entomol. Obozr., Vol. 66(1): 159-174.

Belokobylskij, S.A. 1987. A new braconid genus of the Supertribe Exothecidii (Hymenoptera: Braconidae). Entomol. Rev. (Engl. Transl. Entomol. Obozr.), Vol. 66(3): 116-120.

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Del Castillo, C.R. 1987. Las Especies Espanolas de *Banchus* Fabricius y *Banchopsis* Rudow (Hym., Ichneumonidae). Graellsia, t. XLIII, p. 79-86.

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