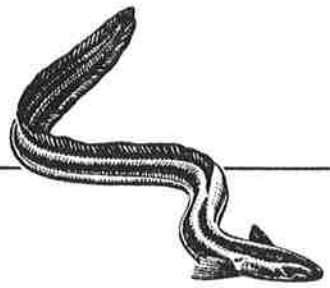

The National Anguilla Club

BULLETIN

Volume 6, Number 3. September, 1969.

CONTENTS

EDITORIAL

It is convenient to make use of the Editorial space this month to bring you up to date with progress on the analytical front. When I was analysing the 1968 session reports, I introduced a number of improvements on the methods I had used for the 1967 reports, and several times I wrote in the 'Report on 1968' (Bull., 5,8 p. 63 et seq.) that I hoped to be able to extract additional data from the 1967 reports in due course.

In practice, this meant completely re-analysing the 1967 material by the improved methods used in 1968, and I tackled this rather large task during March and April this year, before the new season's reports started coming in. In the process, I discovered one or two very minor errors and took the opportunity to correct them; and in one or two cases, slightly different assumptions were needed for the new methods. In all but one of the analyses, the final figures differed (if at all) only quite insignificantly from the original ones. The exception was the water temperature analysis; the figures were affected here because in 1967, I allocated whole sessions to the temperature ranges, whereas in 1968, I split the sessional data where necessary. The revised figures show a very similar pattern, but are noticeably different from the original data.

I also took the opportunity to incorporate the 1967 reports from our former member, Jim Bourke. Due to a misunderstanding, Jim had sent in his reports in one batch in the autumn of 1967, together with a note to the effect that he 'had not recorded any eels below 1 lb.' I replied thanking him but saying that all eels should have been recorded and therefore his data unfortunately could not be incorporated. In due course, Jim replied that he had recorded all his eels, he just had not caught any below 1 lb., but by this time the analyses had been finished and the 1967 Report was in preparation. Jim's data, which add 6 eels and 200 RH approx., make a useful addition, especially as they are mainly in the months of March - May where the rest of our material tends to be thin.

It is not intended to present these revised figures in detail; apart from the water temperature data, there are no significant differences to draw attention to; instead, they will be incorporated in the forthcoming Report for 1969, and the small differences will be apparent to anyone who cares to compare the consolidated figures with those in the Report for 1968.

On the new items produced by the revised analysis, there was less difference between dusk and dawn in 1967 than in 1968, but dusk still gave a faster rate of catch (67 RH/E) than dawn (75 RH/E). The hour-by-hour analysis shows a broadly similar but more erratic pattern in 1967, with a dip in rate of catch during the hour after midnight. One of the most interesting of the new results is the Cloud Cover analysis; in 1967, dark-moon nights gave the same rate of catch (40 RH/E) on both 0% and 100% cloud cover, whereas on bright moon nights, the rate was about half as fast again with 100% cover (54 RH/E) as with 0% cover (75 RH/E). It will be interesting to discuss this when we have the 1969 data and three separate years to consider.

The revised water temperature analysis for 1967/8 combined, using the new 1967 figures, shows the rate increasing from the 45-50°F range to the 60-65°F range followed by a slight decrease in the 65-70°F range; but, of course, there is too little information about results in the 70-75°F range for the pattern to interpreted with any confidence. Hopefully, the data for 1969 will shed some light on this, in view of the hot weather in July and early August.

The new data on rate of change of water temperature support the view tentatively formed from the 1968 results, that it makes surprisingly little difference whether the water temperature is steady, or rising or falling, and whether the rise or fall is 'fast' or 'slow'. This is, at least, consistent with the Cloud Cover data, touched on above, and was one of reasons for saying that some significant factor was not being taken into account. Alan Hawkins has something interesting to say about this, in this issue. - Terence Coulson

THE CLUB VISIT TO CASTLE HOWARD

by Terence Coulson

At the Spring G.M., the Yorkshire sub-group proposed Castle Howard Great Lake, near Malton in Yorks., as a possible venue for a Club summer holiday outing, and in due course the trip was arranged for the week commencing Friday, July 4th. The local admin. was excellent, and members arriving on the 4th. and 5th. found all arrangements made, all possible facilities available and a cordial relationship already established with Estate officials.

A splendid assortment of tents mushroomed overnight and the NAC camp was soon in full swing, with the holiday spirit and the more serious purpose of eel-fishing ideally blended. At 'top-strength', fourteen members were present and although the fishing proved not to be all that it might have been, sufficient eels were caught for ARTHUR SMITH'S rallying call 'Frying Tonight!' to echo regularly across Vanbrugh's 18th. century works. DAVE GOODRUM was also active with the frying-pan at breakfast time, demolishing selected items of the catch with such quiet efficiency that DAVE BALL had perforce to record on his session report, 'Weight about 8 oz., length and girth not known as D.G. ate it!'

In all, thirteen members submitted a total of 85 session reports for the week, covering the capture of 47 eels in 2,460 rod-hours of angling. GEOFF. FLETCHER was laid low with sickness for a night, but had the foresight to arrange his sick leave to coincide with ERNIE ORME'S flying visit, so that results may be conveniently regarded as having been obtained by 12 members fishing for the week.

Eight eels were caught on the night of July 4/5th. although only about half the party had arrived, and if the catch had continued at this level more than twice the number of eels would have been accounted for. However, the rate of catch was much lower on subsequent nights, and it is interesting to speculate on what the cause of this might have been. Broadly speaking, the amount of cloud cover at night increased as the week progressed and several members commented ruefully that 'conditions seemed ideal' after nights when relatively few eels were caught. The water temperature fell more-or-less steadily during the week (Temperatures over 65°F were recorded only on the 4/5th.); might this have been part of the cause? The barometer fell to a minimum of about 29.6 in. on the night of the 6/7th., rose to about 30.15 in. and remained almost steady at this level during the night of 9/10th., and thereafter rose again; and the night of 9/10th. was the second most productive of the week with 11 eels being caught. Might there be a connection, here, with the steady barometer? Does a rising pressure possibly have an adverse effect, directly or indirectly?

The results for this trip alone certainly do not allow this question to be answered and, indeed, the results were too few and unrepresentative for statistical analysis to carry much weight, anyway. However, it is of interest to look at a few breakdowns, as a means of describing the results and getting at least a preliminary insight into the characteristics of the water.

Table I shows the full breakdown by main bait-types. Comparing these data with those in the 1968 Report (Bull., 5,8 p. 100) it is immediately apparent that in terms of the quality of the catch both on deadbaits and on worms, Castle Howard ranks well up amongst the better of the waters that members fish. On dead-baits, it ranks between Balderton East and Cartwright's, whilst on worms it ranks between Benniworth Low and Stickney. In terms of quantity, however, the rates of catch are on the low side and this is particularly striking if one bears in mind that the comparison is between results in July, when prospects are generally relatively good, for Castle Howard; and results throughout the season in the other cases. On deadbaits, both Balderton and Cartwright's have given a rate of catch of 51 RH/E cf. 79 RH/E for Castle Howard; the rates for 2 lb.-plus eels are 89 and 100 respectively cf. 160 for Castle Howard.

TABLE I

Weight Range	Dead-baits	Worms	Total
0 - 1	1	14	15
1 - 2	11	9	20
2 - 3	9		9
3 - 4	1		1
4 - 5	2		2
Total E	24	23	47
Total RH	1,900	537	2,460
Mean RH/E	79	23	52
RH2	160	-	210
Median	2:0	0:12	1:6
UQ	2:8	1:5	2:0
LQ	1:8	0:4	0:12
IQR	1:0	1:1	1:4

Broadly speaking, therefore, Castle Howard ranks in the top 25% or so of our waters on quality, but seems to be a somewhat 'slow' water on present data. Whether, in fact, conditions were adverse during the week, and whether future efforts there might be more productive, remains to be seen in the future.

Probing into the data in more detail, there was virtually no difference between results on single lobworm (25 RH/E) and on bunches of lobs (23 RH/E) but some interesting points emerge from the dead-baits results. Perch baits were very heavily favoured, accounting for nearly 60% of the RH spent on dead-baits, because small perch were found in the stomachs of some of the eels examined in the early part of the week. Perch baits certainly performed over twice as well

TABLE II

	Roach	Rudd	Bleak	Perch
Total E	3	0	5	16
Total RH	449	66	262	1,120
Mean RH/E	150	-	52	70
RH2	450	-	87	140

as roach baits (which are also indigenous to the water) but 'imported' bleak baits gave an even better performance both overall and for the larger eels. Of course, there are not enough data to give a final answer to the question of whether or not there are significant specific differences in the performance of dead-baits, but there is surely a strong inference that this may well be the case. In the writer's view, this inference is supported by the comparison in Table III between baits treated with Pilchard Oil and untreated baits, since a treated bait may reasonably be regarded as a different and more odorous species.

TABLE III

	Without P.O.	With P.O.
Total E	11	13
Total RH	1,340	562
Mean RH/E	120	43
RH2	220	94

In fact, as is apparent from the Table, P.O.-treated baits gave rates of catch in the order of 3 times faster than untreated baits.

Turning now to the effects of bait size, small dead-baits gave a better performance than large ones, as shown by the data in Table IV. This is in line

TABLE IV

	2-4" baits	4-6" baits	6"+ baits
Total E	18	6	0
Total RH	990	818	47
Mean RH/E	55	140	-
RH2	110	270	-

with the writer's suggestion (see the 1968 Report, Bull., 5,8) that larger baits (whether fish or bunches of lobworms) should presumably show their merits on relatively high rate of catch waters; whilst smaller baits would have the advantage on relatively slow rate of catch waters. The implication here is that, at least during the week under review, the important thing was to get the runs rather than to discriminate against the smaller eels.

In the matter of location, members fished along the entire length of the NE bank where fishing is permitted (about ⅓rd. mile). However, only a few reports included any identification of the pitch fished, so that no analysis of this aspect of location is possible. Most (83%) of the fishing was at long range (i.e. over 15 yards) and this accounted for 94% of the eels. Very little time was spent fishing the marginal shallows, although several eels' stomachs contained large roach scales, possibly derived from the numbers of biggish roach lying dead in the margins. No analysis of these aspects of location - swim choice - is possible in view of the limited spread of the data.

Mention has already been made of the examination of stomach contents, and ALAN HAWKINS assisted from time to time by JOHN WATSON, ALAN BUTTERWORTH and others, took charge of the examination of stomachs and collection of otoliths of all the eels caught, and it is hoped to present a report on growth rate in due course.

Finally, it is of interest to place on record a few notable performances. Firstly, STAN HILL made his mark by putting in the greatest amount of solid fishing-time, which he used very thoughtfully to provide an excellent comparison of the merits of different baits, and bringing him well up in the list of eels caught. BRIAN CRAWFORD topped the list with 13 eels. The two biggest eels were caught by CHRIS BOWYER (4:0½) and DENNIS ECOB (4:6) and, of course, this fine specimen eel qualifies for one of the Club's 'Best Fish' awards.

No great bags were made; no huge Behemoths were brought to bank; but the week will be long remembered by all who took part as a week of pleasant angling in delightful surroundings and in the best of good company. The above notes will show that we also learned something of interest and value. There are indications that Castle Howard Great Lake might well repay further effort at a time when the eels are feeding more freely, and it will be of interest to see in due course whether the pointers to the tactics which might best be employed, and which were gleaned from the results of the Club's week, can be put to fruitful use.

*

THE MISSING FACTOR

by Alan Hawkins

In 'A Report on the 1968 Reporting Schemes' (Bull., 5,8 p. 91) it was suggested that there may be at least one major factor which affects the feeding of eels which is not being taken into account, and which upsets the hoped-for correlation between routine measurements of water temperature, cloud cover, etc., and eel catches. If such a factor exists, it would be of great importance to us to find out what it is, and in the hope of starting the ball rolling, I propose to outline my own pet idea of what it could be.

The factor, I believe, may well be the feeding behaviour of the fish itself in particular the tendency to gorge itself in one feeding spell and then to rest up for a while before feeding again. The effect of physical factors, it is suggested, is on this time interval between feeds; that is, an improvement in conditions shortening, and a deterioration lengthening, this period. Thus, in an experiment in which eels were kept in two aquaria, one at 5°C higher than the other but otherwise the same, the fish showed a faster growth rate in the warmer water than in the cooler conditions. Since both sets of fish were fed to excess, and since a fish gorging itself at one temperature can only accommodate the same as at another temperature, the inference is that the eels fed more frequently in the warm tank than in the cold one. The fact that all chemical reactions speed up with increasing temperature implies a faster rate of digestion at higher temperatures, thus accounting for this effect.

If these effects do occur in the wild, then it becomes of importance to consider not only the conditions on the night when a fishing trip is undertaken, but also the conditions during the preceeding few days. Let us take a simple theoretical illustration. Suppose that in a particular water, under a particular set of constant conditions, the feeding cycle is 4 days. Let us also suppose that some eels feed every night, and represent these eels by N1, N2, N3 and N4 (N1 being the number of eels feeding during night number 1, etc.) Without saying anything about the sizes of these feeding groups, we can say that N1 + N2 + N3 + N4 = the total population of eels in the water. Then, as long as conditions remain the same, and without introducing any complications at this stage, the cycle will be self-perpetuating and of the form:-

Night No.	1	2	3	4	5	6
Feeding group	N1	N2	N3	N4	N1	N2.....etc.

Now let us consider what would happen if the conditions fluctuate as in a typical British summer, and for the sake of simplicity consider changes which have the effect of shortening or lengthening the feeding cycle by 24 hours. Consider an improvement shortening the cycle to three days, for example, starting on the night preceeding night 1; the cycle becomes:-

Night No.	1	2	3	4	5
Feeding group	N1 + N2	N3	N4	N1 + N2	N3.....etc.

Thus, in night 1, we get N1 eels feeding, which would have fed anyway; and also N2 which have been brought forward by 24 hours. On night 2, we have N3; on night 3, we have N4; and so on.

What happens if conditions now return to their former level? Again, say the change occurs during the night preceeding night 1; we have:-

Night No.	1	2	3	4	5
Feeding group	0	N1 + N2	N3	N4	0.....etc.

Hence, N1 + N2 are delayed one night, giving a perfect blank every fourth night.

We can now begin to see where this is leading us; it is a one-way process with the inevitable result that, in the end, all the eels will feed on the same night, and the rest of the cycle will be blank. Successive rises and falls in conditions gradually bunch up the fish into one feeding group.

We must now begin to introduce the complications: the factors which work in the opposite direction.

The first of these can work in both directions at once. This is the possibility that a change is not large enough to shift a whole feeding group from one night to another, but only a part of it. Such changes can lead to very complex algebra - at least to me! - but the result is that bunching will still occur, but will not remain so constant.

The second complication is the possibility that the time between feeds depends on the size of the fish, with small eels feeding more frequently than big ones. If this is so, there will be fewer nights when bootlaces cannot be caught than when larger fish cannot be caught, even without considering the relative numbers of the different size-groups in the water.

Thirdly, the illustration assumes 100% success for each eel whenever it sets off to find food. Only in the very best waters is this at all likely, and in most one would expect there to be a 'leakage' of fish from one night to the next, so that a number of the eels foraging on night 1 would be obliged to try again on night 2. This gives the prediction that the fish should be less sensitive to changes in conditions in poor waters than in productive ones with an abundance of food. I suspect this to be supported by the evidence we have on RH/E correlated with average size of eel from different waters. Thus, in Yorkshire, a blank trip has yet to be recorded at Sandbeck Lake, which yields predominantly small fish of slow growth rate. The reverse is true of Dringhouses. Of course, this is to say nothing of the possible differences in total population between these waters; on this model, we could still get the same result if, in fact, both waters held the same population density. Such leakages would be greater in numbers of fish from a large group than a small, having the effect of smoothing out irregularities.

Lastly, there is the individual variation between eels in their ability to find food and in their rates of digestion. These individual variations are, in fact, implicit in the first item in this list of complications, and no more need be said here.

In general terms, then, we can suppose the eel to respond to chnging conditions after the fashion represented by the diagram on p. 21. It can be called a progressive lowering ofa threshold value in response to an increasing stimulus, a system well known in Biology. The stimulus is hunger, and the threshold value is the sum total of all the environmental factors which influence the frequency of feeding.

Thus, an eel which has just fed will require exceptionally favourable conditions to feed again immediately. As time goes by, so its hunger increases and the conditions in which it will feed become therefore less exacting. There will come a time when the threshold has sunk to the conditions actually prevailing and then the fish will feed again.

Most animals behave in this way in some respect or other. For example, if I have just eaten a large meal I would not be inclined to go out and buy another however nice the day. A few hours later, I might go out if the sun was shining, but not if it was pouring with rain. Eventually, when I became sufficiently hungry, not even a blizzard would stop me.

As far as fishing is concerned, anyone who supports the ideas put forward above (if, indeed, there is anyone) will have to think in terms of what the

weather has been doing for some time before a proposed trip. Thus if one has a choice between (say) Friday or Saturday for a session, but not both, a system of daily temperature records may help to decide which of the two would be most

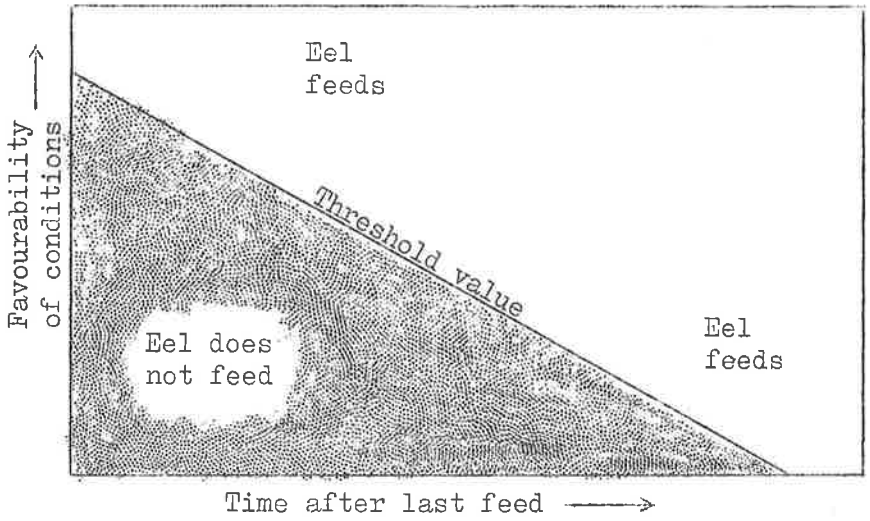

Diagram: proposed relation between external conditions and feeding
The threshold value is arbitrarily drawn as a straight line. From the diagram it can be seen that any change in conditions will have an effect on the time interval between feeds.

suitable. Ideally, considerations of this nature would best be applied to waters of special interest to which visits are frequent; for it may be possible eventually to deduce what is likely to happen from what has gone on in the previous trip and from what the conditions have been like between trips.

If nothing else, this system shows that a blank in favourable conditions need not be quite such an enigma.

*

A PASSAGE TO INDIA?

'PLINY, the philosopher, says, in the third chapter of his ninth book, that in the Indian Sea, the fish called Balæna or Whirlpool, is so long and broad as to take up more in length and breadth than two acres of ground; and of other fish of two hundred cubits long; and that, in the river Ganges, there be eels of thirty feet long.'

Izaak Walton: THE COMPLEAT ANGLER (1653)

(Contributed by Brian T. Knott)

HOLDING PLACES: VIII

by Chris. Bowyer

I fully agree with Dave Marlborough (Bull., 6,2 p. 11) that, in waters where they occur, neutral feeding grounds provide the best prospect of an eel. However, the majority of us are after big eels; and finding such neutral feeding grounds, far from meaning bigger-than-average eels, in fact means quite the opposite. There are so many small eels in such an area that it reduces one's chances enormously. Also, finding such neutral feeding grounds is as hard, if not harder, than finding the holding place itself.

For example, how many of us have found a neutral feeding ground in (say) a canal? Not many, I imagine. There are not many such areas because the eels are few and far between, giving each eel plenty of room to live and feed. It is a far better bet to fish the holding places - which stick out a mile, as Ray Brown pointed out (Bull., 5,5 p. 38). All that is needed is to fish them at the right time with the right bait.

The reason I think so few big eels are caught, from whatever water, is failure to fish at the right time i.e. when the eel is feeding. For the most part, we are limited to Friday or Saturday nights, and although we can try to encourage the eels to feed by ground-baiting, or using bait-additives such as Pilchard Oil, if he is not feeding it is a case of 'You've had it, mate!' It is therefore vital to know that one's bait is in the best place.

Canal holding places present no particular problem because most of them are easy to see. Are they so easy to find in a lake or pond? I would answer 'yes' - at any rate, for most of the waters Alan Hawkins and myself fish; if one knows what one is looking for, that is.

In my experience, there are two pre-eminent holding places: large trees that have fallen into the water, and thick weed-beds, the latter being my first choice - not because the eels prefer one to the other, but because the eels are a sight harder to extract from trees than from weed-beds; and they can be awkward enough from the weed!

So much for holding places that are visible; but it is not as difficult as one might think to locate holding places that cannot be seen. For instance, if one keeps one's eyes and ears open, one may get to know of rubbish - old cars, oil drums, masonry, etc., - being tipped into the lake, and my guess is that there awaits a big eel for the catching.

These places are not what I would call real 'hot-spots', for I have never come across one that held big eels in any numbers. I have mentioned hot-spots before (Bull., 5,9 p. 114) in a discussion of channels in the bed of the lake one fishes. Whether the chennels be deep or otherwise, they can at times hold big eels in large numbers. I do not know whethether these eels live in holes in the channel sides, or whether they are working along them to other feeding grounds. But I do know that small eels do not seem to like these channels holding a large head of big eels: probably because 'big brother' does not give 'little brother' much chance to like it - he chases him out!

The next best bet is a place where the bottom drops away steeply, and placing one's bait in such a place can pay off handsomely. To find such places means plenty of work with float and plummet - a task at which Alan Hawkins and myself have spent many instructive hours.

I wish everyone the very best of good fortune with the big eels, but no one should run away with the idea that, once one of these places has been found, one casts out and catches a big eel: as I said before, the eels must be on the feed.

*

Notable Eels : SHROPSHIRE

LOCATION	CLASS	WEIGHT	LENGTH	GIRTH	DATE	TIME	BAIT	CAPTOR	SOURCE
R.Severn, Shrewsbury	1.	5:6			Jul 68	03.45	Worm	J.Owen	AT 1.8.68 p. 20
Whitemere	2.1	6:0	40	8	Jul 64	day	Worm	W.Lyon	AT 31.7.64 p. 1(P)
		5:4			Jun 63		Worm	H.Glaves	AT 5.7.63 p. 13
		4:0			Jul 64	day	Worm	W.Lyon	E.Orme ex captor.
Hawkstone Lake, Marchamley	2.	7:0			48		Deadbait	Bailiff	P.Rayment, witnessed.
		5:8	41	9	May 66	night	Lobworm	G.Wood	AT 10.6.66 p.
		5:6¾			Jul 56		Roach l.b.	N.Mann	(AT 10.8.56 p. 1 (E:HTCT
Ellesmere	2.	4:0			Aug 60		Lobworm	R.Davies	AT 9.9.60 p. 1
Blakemere	2.	4:12			Jun 56		Gudgeon db	G.Ellerton	(AT 13.7.56 p. 13 (E:HTCT
Randlay Pool	?2.	6:9½			Aug 59	04.45	Livebait	G.Chetwoods	AT 21.8.59 p. 1
Walcot Lakes, Craven Arms	2.	4:8			1 May 66	12.00	Lobworms	K.Crawford	J.Bourke.
Berwick Lake, Shrewsbury	2.	4:3			Aug 64		Roach lb.	C.Davenport	AT 21.8.64 p. 2
Shrewsbury Canal, Newport	2.3	5:4			1 Jul 60		Deadbait	J.Lees	AT 15.7.60 p½ 1

CORRESPONDENCE

MISCELLANY

From Bob Jones: 'The other evening, I was browsing through some back-numbers of the Bulletin when I came across the article "Eels in L. Ainslie, Nova Scotia" (Bull., 5,1 p. 2) in which reference was made to eels making sucking noises. The reviewer asked whether our eels do this at all. I have fairly definite proof that they do. Pete Climo and I fished Redmire Pool very regularly from 1966 to 1968, and during that time we constantly experienced "clooping eels". Any sucking noises from patches of scum and clumps of weed seemed invariably to be eels, as was shown only too clearly when a bait was placed in the appropriate spot. The first person to point out the connection was Bob Rolph, a former Club member, who made an extensive study of these "cloops" during a week session at Redmire. What were they taking? Snails seems to be the most likely explanation as Redmire is absolutely "crawling" with the things.

'In another issue, an extract from the Northampton Group rotary included an exhortation from Bob Church: "....be sure to use a TRACE." Why? Pete and I never use traces and we have landed some fairly big eels.

'An interesting problem arose in school the other day. One of the boys in my form had been eel-fishing (that seems to be all the rage!) and caught one with the following markings, in blue: ///UN. Is it United Nations Agent No. 3 in disguise? Or a new type of guided missile devised by the same people, able to home in on a dead fish or bunch of worms from an incredible distance? Seriously though, can anyone throw any light on this matter? Do we know of any biological concern with these initials?

'By the way, there was a small news item in the magazine "Animals" some months ago, which gave details of an eel being tagged in Berlin and then subsequenly recaptured in the breeding grounds in the Sargasso Sea. To me, this seems to be a remarkable piece of evidence in support of many eels surviving the long trek from Europe to mid-Atlantic. I know one cannot generalise from one instance, but surely it would be safe to so in this case?

'Finally, may I through the correspondence page of the Bulletin, offer my services for otolith removal? If members would send eel heads to me, I would be only too pleased to complete the operation.'

**Your Editor has approached Dr. Jones of Liverpool University on the matter of the mysterious ///UN marking, but Dr. Jones was unable to throw any light on it, so evidently the marks did not originate in the Liverpool eel work in Wales. If any member knows how the marks may have originated, we should all be interested to hear about it - and, of course, about any other observations of artifidally marked eels. Your Editor would also be glad to know, from anyone, the date of issue of the copy of "Animals" which contained the reference to the recapture of the tagged eel in the Sargasso. Incidentally, if anyone decides to take up Bob Jones' kind offer to remove otoliths, Bob - and the GPO - would be more than grateful if the heads were preserved by a few days' soaking in formalin solution before despatch!