Mr. T. Barkley

WATS ON

JULY 1965

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C

All of you will have heard by now of some recent management decisions regarding Bactil and Bactil-60. A number of side issues relate to these decisions, amongst the most important being the decision not to proceed with a new catalogue.

Details of the Bactil-60 will continue to be sent to customers in the form of the provisional leaflet now available but there will be a number of single sheets issued in the near future to give adequate information on the Hilux base models, filters for fluorescence, projection lamps etc. These will also cover (separately) the Service 3 Hilux microscopes.

No more catalogues will be printed for the following products:-

Graticules
Standard Metallurgical Microscope
Microprojector
Eyepiece Camera
Brinell Microscope

The policy on marketing of graticules is being discussed at Barnet and you will be notified of decisions as soon as they are made.

Every effort is being made at the moment to conserve expenditure so that the maximum punch can be given to the launching of Microsystem 70 and because of this no more binders will be available when the present stock of approximately 30 has been exhausted. You are asked to place these only where absolutely essential.

With the introduction of Microsystem 70 and the disappearance of Bactil and Bactil-60, more and more of our objective production will be in the 45mm. parfocal length and some thought is being given to the supply of these with the Service microscope should we continue to manufacture this model. Such a decision would mean that there would be a loss of 11mm. focusing motion and a dovetail stop may have to be provided along the lines adopted with the Research Stereo when the latter is fitted with a movable stage. The production of 34mm. parfocal length objectives however, will

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have to continue for a number of years as replacements and additions to existing microscopes. The foregoing will, of course, also apply to eyepieces.

The decision to discontinue the Bactil-60 microscope leaves us with one or two sales problems mainly concerning stocks of slow moving items, in particular we will need to try and move as quickly as possible Phase 60 Phase Contrast lamp units and you should never lose an opportunity to try and sell these to existing Bactil-60 microscope users. A straightforward question such as "have you ever considered using Phase Contrast techniques" can often lead to demonstrations and subsequent sales. This type of approach can also be used for many of our other products, particularly if you know that the customer has never had an opportunity of seeing some of the more recent developments. I have in mind such things as Interference Objectives, WISE and particularly Zoom Stereo. A more positive and somewhat forceful selling approach must be made and it is interesting to record a recent experience at the University of Reading. We had been asked by the Botany Department to demonstrate our range of standard Stereo microscopes and it was felt that we should take along the Zoom Stereo at the same time so that this could be used as a prestige instrument to raise the level of the Watson image. The examination of the Zoom Stereo was at first viewed in the light of academic interest only and it turned out that they had already decided to purchase Zeiss Zoom Stereos but I am pleased to add that they were so well impressed with our instrument that we obtained an order for three on the spot. In addition they placed an order with us for 20 Box Foot Stereos. There is little doubt that the Zoom helped us in the standard Stereo negotiations and will probably help us in our other negotiations with this Department.

Whilst on the subject of catalogues, the latest date for the issue of the new Stereo catalogue is early September. This catalogue will bring with it a number of new innovations including the use of drawing numbers as code numbers which will considerably speed up documentation and interpretation through the lines of communication of the factory. Other major alterations in this catalogue will be the breakdown of heads and stands making it essential for the customer to choose a head to go with the stand rather than one model as is the case at the moment. The catalogue is designed to show the extensive range that we manufacture compared to other firms and particularly when compaired to the new Vickers instruments. All orders received at Barnet from this new catalogue will be placed on the works under the present code numbers for the remainder of this financial year for record purposes. The new code numbers will appear on order sheets from the 1st April next.

A single page leaflet for the rackwork long arm stand for the Zoom Stereo microscope is due very shortly and this also details the polarising accessories, the movable stage, the incident light attachment, the auxiliary

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lens x 0.4 and the micrometer eyepieces. Instruction booklets for Service 3 Phase Contrast and Bactil-60 and Service 3 Hilux bases are being prepared and there is also in hand a range of labels for sticking to quotations etc. giving details of the area technical representative.

We expect shortly to be going back to individual price lists for each catalogue as it is felt that this is more convenient for the customer to use but these will be printed and will give more detail than the roneod sheets used in the past. They will also contain an indication of prices in code numerical order.

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QUARTZ-IODINE ILLUMINATION

The present position on Hilux bases is that you should receive within the next few weeks your demonstration Service 3 and Bactil-60 instruments. The outfits ordered from the works for supply to you form the bare necessities as you should be able to utilise some of the optical equipment with these instruments that you already have on your depot stock. The Service 3 Hilux model is the basic projection outfit and competes very favourably with the Gillett & Sibert equivalent.

We understand that the Quartz-iodine bases suitable for the Vickers Patholette and the Vickers M15B are on a six months delivery and any information you can obtain about prices would be most interesting. Also information regarding other manufacturers prices, marketing techniques etc. will always give us an opportunity to be one ahead of them. Customers opinions on new instruments such as the Patholux would also be of interest to us. Please remember that you are the people who are continually in touch with the customers and therefore in a better position than anyone else to provide this sort of information.

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WATSON X 10 COMPENSATING EYEPIECES v VICKERS X 10 COMPLAN EYEPIECES

Many of you have been promoting the availability of Vickers x 10 Complan eyepieces for supply with our range of microscopes. The following details are set out for you to consider this matter at greater length and relate to the comparison we have made at Barnet between these eyepieces and our own x 10 Compensating eyepieces with modified field stops. Your views are requested as soon as possible so that a definite decision can be made:-

With x 40 Para NA 0.65	Eyepoint	Field of View	Performance	Price	Comments
Vickers eyepieces	20mm.	0.42mm.	identical	£ 7. 2. 0d.ea.	ACT suggests Vickers eyepieces suitable for use with x 40 Para flat field NA 0.65 and Watson eyepiece NOT suitable.
Watson eyepieces	8mm.	0.39mm.		£ 4. 0. 0d.ea.	
With x 40 Para NA 0.65					
Vickers eyepieces	20mm.	0.42mm.	identical	see above	ACT suggests Vickers eyepiece NOT suitable for use with higher power Paras but Watsons are.
Watson eyepieces(modified)	8mm.	0.42mm.			
With x 10 Para NA 0.28					
Vickers eyepieces	20mm.	identical	Vickers superior at edge of field.	see above	Vickers eyepieces must be modified to suit Watson objective parfocal length.
Watson eyepieces(modified)	8mm.				

Further examination of modified x 10 Compensating eyepieces will be made and reported to you as soon as possible.

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DELIVERY SCHEDULE

BACTIL-60 (Standard Optics)	–	3-4 weeks
BACTIL-60 (Apo. Optics or Phase Accs.)	–	5-6 weeks
HILUX	–	10 weeks
BACTIL	–	3 weeks
SERVICE 68	–	5 weeks
SERVICE 69	–	No longer available
SERVICE 3 (292)	–	3 weeks
SERVICE 3 (293)	–	3 weeks
HILUX	–	10 weeks
BARNET STAGE	–	3 weeks
SERVICE 3 (1293)	–	6-8 weeks
STEREOS: 850 range	–	3 weeks
1050 range	–	3 weeks
Box Foot	–	8 weeks
Research	–	4 weeks
L.A.S.	–	4 weeks
Zoom, Inclined	–	6-8 weeks
Zoom, Vertical	–	7-8 weeks
METALLURGICAL	–	3 weeks
MICROPROJECTOR	–	8 weeks
EYEPIECE CAMERA	–	3 weeks
LAND CAMERA	–	3 weeks
35mm. CAMERA ATTACHMENT	–	3 weeks
KONIMETER	–	6 weeks
W.I.S.E.	–	4 weeks
FLUORESCENT ILLUMINATOR	–	10 days
16mm. INTERFERENCE OBJECTIVE	–	4 weeks
8mm. INTERFERENCE OBJECTIVE	–	4 weeks

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T.S.M. No. 31

R.

MICRO 65

We went to Micro 65. This was a symposium on technical microscopy organised by McCrone Associates of Chicago. The emphasis was on the microscopy of particles and papers on both electron and optical microscopy were presented. The symposium was from 6th - 9th July at Sheffield University and was organised by Professor Barer.

The large number of interesting papers included a description, by Dr. Cole of Metals Research Limited, of the qualitative television microscope (Q.T.M.) which has been developed for the automatic counting and measurement of inclusions in metal sections. An interesting discussion by Mr. Simmens of the Shirley Institute on the microscopy of textile fibres in which he pointed out that the WISE was less suitable for this application than the Dyson eyepiece because of its polarising properties. (Our Technical Department have now confirmed that the WISE could be supplied with a neutral beam splitter for textile work, in which form the polarising effects are very much less marked and comparable with the Dyson instrument). A number of speakers emphasised the importance of techniques using both electron and optical microscopy and showed how the results of the two methods could be used to mutually assist their interpretations.

An exhibition of microscopy was held in conjunction with the symposium which was probably the most comprehensive exhibition of optical microscopes to be held in this country for many years. All the world's well known microscope manufacturers were represented except Bausch and Lomb and it is thought that NACHET, the French manufacturer, was showing instruments in this country for the first time for many years. Interesting items in the exhibition included the following:-

Olympus - An elegant transmitted light system contained in the base of a microscope gave Kohler illumination for a wide range of objectives and was housed in a relatively compact base. We were relieved to see that the phase contrast on this instrument was poor and that the price for a binocular bright field instrument with mechanical stage was around £300.

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Wild - Showed a new surface finish interference microscope which gave an impressive image but no one on the stand could give any details of the principles on which it operated or of the price.

Reichert - Showed a new microphotometer capable of measuring the brightness of very small parts of a specimen. This instrument was also the topic of a paper by Professor Gabler.

Zeiss (Western Germany) - Showed a most interesting fluorescence microscope in which the primary ultra-violet light was focused on to the specimen through a conventional vertical illuminator. It was claimed that the secondary fluorescence in the reverse direction is considerably stronger than in the forward direction because of absorption by the specimen itself and the performance of the instrument on show seemed to confirm this claim. Other advantages of this system are that practically no ultra-violet enters the eyepiece so that colourless secondary filters can be used safely and that conventional phase contrast can easily be superimposed on the image from below without having to use complicated interference annuli or lossy beam splitters. Perhaps we could improve on this system by using an interference filter in place of the ordinary vertical illuminator cover glass in order to obtain high reflectivity for the ultra-violet and high transmission for the visible?

The attendance at the exhibition, except for the delegates to the symposium, was disappointing confirming our suspicions that big exhibitions are seldom successful except at the metropolis.

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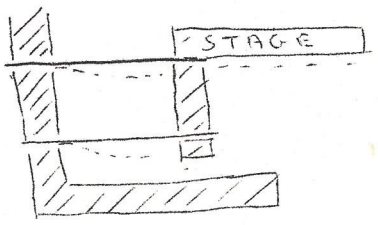
T.S.M. No. 32/765

C.

PARALLEL SPRINGS

I sometimes read, in magazines on "selling", verbatim reports of interviews between super-salesmen and buyers in which the sceptical buyer is converted to the salesman's products by the end of page one and places a substantial order early on page two. I have tried to use this technique to convey some thoughts on parallel spring fine focusing mechanisms.

Customer : The twin flat spring parallelogram movement like this :-



(he scrawls in biro on the representative's last 6F catalogue) surely cannot be satisfactory for a microscope F.A. movement because it is not rectilinear? The horizontal movement must be troublesome when focusing.

Representative:

It is true that there is some horizontal movement but objection to this colapses when one considers its magnitude. I have calculated that for springs 25mm. long and a fine focusing range of 1mm., that is $\frac{1}{2}$ mm. above and below the position where the springs are horizontal, and taking the worst possible case, that is at the end of the F.A. movement, and for a low aperture objective with N.A. about 0.1, that the sideways movement corresponding to a vertical movement through the full depth of focus is about 2 microns which is less than the resolving power. Near the centre of the F.A. range, the sideways movement will be very much less than this and with higher aperture objectives the situation is also better because although they can resolve smaller lateral

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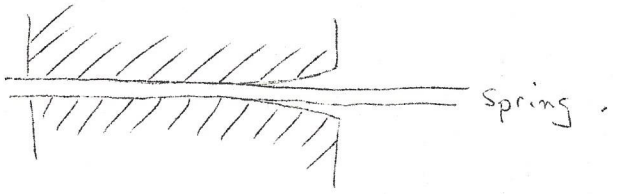
movements, the depth of focus and hence the total vertical movement through which the object can be observed diminishes much faster than the resolution.

C : My other objection to the system is that, as many engineers know, a flexible part clamped rigidly for part of its length is subject to extraordinary stresses at the end of the clamped region. I remember an early form of this fine focusing mechanism, on another manufacturer's instrument, which suffered from very frequent spring breakage.

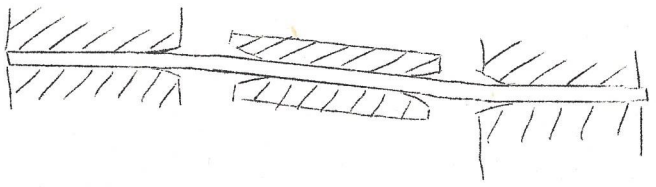
R : There are two ways of avoiding this difficulty. Firstly, the blocks clamping the spring can be slightly shaped like this:-



avoiding the stress concentration and secondly, we can use one of the new non-ferrous alloys which are far less susceptible to work hardening under these sort of conditions.

C : If your springs are flexible enough to enable the mechanism to move freely, why can they not also buckle and so allow the stage to tilt sideways.

R : They could, in the system you have sketched, but spring buckling can be eliminated by clamping the centre part of the spring between plates like this:-



so that they can only bend at the ends. This results in an extremely rigid support for the stage in all directions except the vertical one.

C : You have answered the objections to this mechanism but all this is rather negative, what are its advantages?

R : The important advantages of the system arise from the elimination of sliding parts. This means that

A) No lubrication is either necessary or desirable.

B) No very accurate machining or shaping of parts is required.

C) No very accurate adjustment is necessary.

D) Static friction is completely eliminated.

In practice this means that back-lash (mechanical hysterises) is completely eliminated.

C : How does the mechanism affect linearity for vertical measurement work?

R : This is purely a form of slide. It constrains the stage to move freely in the focusing direction while preventing it from moving in any other direction. An actuating mechanism is still required and it is the geometry of this actuating mechanism which controls the linearity.

C : You have convinced me - I will sign an order for 2,000 microscopes now so that you can take it with you. The delivery date is not important but please invoice them this week.

A.C.Terrell

WATS ON

The Editor,
WATS ON,
Barnet, Herts.

8th June, 1965.

Dear Sir,

THE BAD OLD DAYS

or

COMING UP THE HARD WAY

Sometimes, when I think about Watson's representatives of today and compare their beginnings with my own, I feel like echoing Tommy Trinder's cry - "You lucky people".

Consider for a moment how they do start. A period, often several weeks long, of introductory experience in the factory and in the laboratory - perhaps some introduction to sales experience with one of the established representatives - then setting out, equipped with a firm's car - a comprehensive stock of demonstration equipment - a fixed salary - and all expenses paid.

When I started, many moons ago, the idea of representatives was new to the Firm, and mine was the first appointment. I was called for interview to the Head Office, in Holborn, and was there interviewed by old Mr. Baker, the father of Mr. Wilfrid Watson Baker, who told me what he considered to be the possibilities of the territory which they had in mind for me. I was then passed on to old Mr. Watson, (the last of the Watson family) who was in charge of the finances of the firm and who gave me the terms of my appointment - a nominal salary, amounting to a few pounds per week, a commission of 20% on all sales which I effected - but I would have to pay all my expenses.

I was then sent to the Factory at Barnet which was in charge of a Mr. Reyersbach - one of the Directors - for my "training". This training was as follows :-

On reporting to Mr. Reyersbach, I was welcomed in his office with a cup of tea. We talked of horses and politics and diamonds (he was connected with the South African family of De Beers, the big diamond people) and I was then told to go off for the rest of the day and to come in next day at about 11.00 a.m.

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The next day, at 11.00 a.m., I had coffee with Mr. R., after which he gave me some back numbers of "The Microscope Record" to read. When lunch-time arrived, he took me over to the Black Horse for a very leisurly lunch of sandwiches and lubricant, and, eventually, we returned to his office - where I looked through the current catalogue until tea-time. Tea, still in the office, and then dismissal, to allow him to deal with his letters. So far, I had not even seen a microscope, still less looked through one.

The next morning, I was handed over to Mr. Eyres with instructions that I should be shown the new system of "Production Control" which, as far as I could see, consisted of a multi-armed thing like a sign post, to the arms of which were attached coloured labels bearing such unintelligable (to me) names like "Best Form Stages", "Fine Adjustment Spindles", "C.A.Milled Heads", &c, &c. A further session with the catalogue, reading by myself, then followed.

After a repeat of the lunch-time session at the Black Horse, Mr. R. thought that I ought to see round the Factory. We chased through it - "This is where we machine the parts" - "This is where we assemble the instruments" - "This is where we grind and polish the lenses" - and, in about 10 minutes, dead, we were back at his office. But - I did see several microscopes in that tour, although I had no chance of looking through one.

A final session for tea in Mr. R's. office concluded my tuition, and the next day I set off on my travels. I must confess that I barely knew one end of a microscope from the other - achromats, apochromats, condensers and so on were just mysterious names to me - I am quite sure that nobody as unprepared as I was has ever set out on a selling journey.

My first assignment was to take the Service Met. round the steel works of Sheffield. The Service Met. was not a very good met. microscope, being but a converted biological stand, but I did not know that at the time, and so I started off, carrying a sample microscope with all accessories - on foot - in blazing June sunshine, to steel works of which I had never heard.

In place after place where I did get in, and that was not everywhere, I was met by the same story - "Oh, the representative of Leitz has recently been round with all their new instruments, and we have just bought so and so." It was heartbreaking work, and night after night I returned home with sore feet and an empty order book. Incidentally, that representative of Leitz was named A.G. Woodger, and, 12 months after my appointment, as the first rep., I was informed that he had joined Watson's as their

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second rep. and that he had been given Scotland for his territory.

At the end of my first month I received my cheque - and the commission (on which I was chiefly dependent) amounted to the princely sum of 5s. 9d. I had, of course, paid all my expenses for the month.

Such was the curious way of doing things in those days that, after my 2 days of "training" at Barnet, I did not see either the Holborn office or the factory at Barnet for another 5 years.

So, comparing my experiences with those of today's representatives, I still say, with Tommy Trinder - YOU LUCKY PEOPLE.

Yours faithfully,

J.D. Casartelli