The LKB Ultrolab Diluter is one of the fastest and most accurate diluters on the market. It will siphon up a preset volume of a sample liquid and flush it out with a preset volume of a reagent at a rate of up to 1200 times an hour.

The Ultrolab Diluter can also be used as a dispenser, to dispense one or two reagents at the same high rate.

Each pump is permanently preset to deliver 10 different volumes, which can be selected by merely pressing a pushbutton. Three pumps are available to choose from, giving in all a choice of volumes from 10 µl to 3000 µl. These are high-precision pumps, with an accuracy of ±1% and a reproducibility of ±0.5%. Tight, leak-free operation is achieved by employing smooth, sapphire pump plungers.

Operation is simple. To change over pumps you just press a button and remove the pump, complete with reagent bottle. You can immediately begin dilution or dispensing for a different type of analysis by plugging in a spare pump with a new type of reagent. A convenient hand pipette and a foot pedal control are available as optional items.
Written any books lately? Published lots of papers?

If not, how will they know you’re productive?

Back when natural philosophy was turning into science, natural philosophers tried to keep in touch by letter, being literate men. Within a few generations the various printed Proceedings, Comptes, and Annalen were providing better communication among peers than the unamplified quill. To this very day and in the pages of this very magazine, printer’s ink demonstrates the respect of one’s peers for one’s work and thought.

Now glance at the “Reports” in this prestigious journal. You may be willing to admit privately that some of those peers of yours use a mysterious language all their own, just as you yourself in your own field are judged by your obvious ease in reading and writing the language of that field. Peers who can’t understand each other are peers only in a stuffy, formal sense. Your real peers are a small bunch, perhaps no more numerous than the subscribers to Volume I of those Annalen.

In the meantime, the industry that spreads ink artfully on paper—which happens to include some of Kodak’s best customers—has geared itself to consider 10^6 a modest order. A modern printing press that serves 10^3 savants must scream shamelessly for financial angels.

Kodak offers two viable alternatives when the true objective is communication at the cutting edge rather than enshrinement in an impressively bulging bookcase:

1. Publication by microfiche is for words, equations, symbols, drawings, photographs where color is highly desirable but unthinkable economically from a printing press. Right now arrangements can be made to send us a typed discourse with color slides or black-and-white illustrations and get back as many microfiche copies thereof as are needed to mail out to all believed capable of appreciating it. (But color photography is not eternally true.) If the content is to go through referees and editors before reaching us, that would be just fine. The reading devices should be comfortable grading of coffee breaks for departments where creative thought is a job requirement.

The beauty part: Super 8 doesn’t have to be read out by TV. The very same reel of film can also be consulted on a tabletop movie projector by an audience of one or shown to hundreds on a big screen in a large lecture room. It may have been exposed in a simple home movie camera without auxiliary lighting. If it is intended as a form of publication, labs anxious for the business of striking off copies can be found through almost any sizable phone directory.

2. Communication by super 8 film is for intellectual content better conveyed in action than verbally and by static graphics. The super 8 medium can join the microfiche as a respectable descendant of the book, which can itself continue to thrive for more popular entertainment and instruction.

The Kodak Supermatic Film Videoplayer will be available by early 1974 at around $1200. It will make a readout device out of the common TV receiver, which has already attained adequate ubiquity. When playing magnetically striped super 8 film, our videoplayer will feed the words or other sounds to the TV speaker. Consider the expenditure an investment in the up-

Titles like “Micropublishing Programs and Services,” “Micropublishing for Professional Associations,” “Basic Guidelines for the Selection of Input Material for Color Microfiche” and literature on microfiche readers, the new film videoplayer, and the tabletop projector may help a laboratory plan how to publish its research during the years ahead. Just indicate interests to Dept. 55S, Kodak, Rochester, N.Y. 14650.
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Nalgene Economy Wash Bottles (Cat.
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rate, volume and direction of stream.
One-piece, flexible polyethylene dip
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without crimping, breaking or crack-
ing. Tapered, molded tip can be cut
back to increase flow or removed for
maximum flow. Uniform walls of con-
ventional polyethylene permit almost
effortless operation without weakspots.
Six sizes: 30-1000 ml.

Nalgene Wash Bottles (No. 2402) are
molded in one piece (bottle and tube)
by a patented process—eliminating any
possibility of leakage. No tipping or
shaking necessary to empty completely.
Four sizes: 125-1000 ml.

Nalgene Teflon FEP Wash Bottles
(No. 2403) handle strong solvents or
liquids which might damage other plas-
tics. Autoclavable—use them where no
contamination is acceptable. For use at
temperatures as low as -200°C, as high
as +200°C. Four sizes: 125-1000 ml.

Nalgene Safety Wash Bottles (No.
2404) molded of red conventional poly-
ever for high visibility, with verti-
cally ribbed surface for accurate touch
identification. Indicate inflammable or
dangerous contents. Protect light sensi-
tive liquids. Two sizes: 250 and 500 ml.

Order from your Lab Supply Dealer.
For details write Dept. 4207A, Nalgene
Labware Division, P.O. Box 365, Roch-
ester, N.Y. 14602.

...some string, a stone, an oil lamp, a
pointer, a few pegs, and a gallon of
water—we are convinced that we could
achieve the required accuracy in one
night’s observation. Our philosophy is
if we can devise an experiment today
which was equally feasible 6000 years
ago, it is fair game to use it to establish
the limits of accuracy that could have
been achieved. That a different method
may have been used is of secondary
importance.

To support our contention that an
accuracy of 1’ is feasible, we quote from
another letter (I) We received. O’Keefe
writes, “There is no real problem about
aligning within 1’. Remember that a
rifleman will put 10 shots out of 10
within the innermost 1/4-inch circle
on a target 50 feet away using open
sights and supporting his rifle with his
hands. This is just about 1’. Given any
kind of firm support, it is possible to
point to a much higher accuracy. The
last of the astronomers to prefer open
sights to telescopic sights was Hevelius;
I believe he got an accuracy greater
than that of Tycho Brahe, whose errors
were about 40’.”

O’Keefe also mentions the possibility
of transferring a meridian from one
set up at a distance, as does Stephe-
son. O’Keefe further points out that
such a reference meridian would dif-
fier by 4’ westward if it was only 6
km to the east. The transfer of such a
meridian is by far a more difficult task
than on-the-spot alignment, but we
would be interested in an outline of the
procedure and the result of a test
experiment. Nevertheless, these ques-
tions are secondary to the question of
the limit of precision that is feasible,
which is Stephenson’s main question.
Even if we knew the exact procedure
used, we could not know its accuracy.
We can ask our physics students to
repeat certain measurements a number
of times in order to establish the
standard deviation of the distribution,
but only two pyramids were aligned
with such accuracy. However, we can
examine other constructions. In an
article (2) in the London Daily Tele-
graph, A. R. Michaelis wrote:

There is now to hand an all too short
announcement that geophysicists in Uzbe-
kistan have observed that the great ma-
sory sextant of the Observatory of
Samarkand has moved by 10 minutes of
arc since it was built in 1428.

This was published in Soviet Weekly
on March 30, but did not mention the
names of the scientists concerned. The
famous observatory in Samarkand, now
the oldest in the world, was built by the
great Russian astronomer Ulugh Beg, who
lived from 1393 to 1449. He was Gov-
er of the Province, wrote poetry and
history and loved building in a grand
style.

Michaelis then continues by speculating
that it would also be worthwhile to
make an accurate survey of the con-
structions of Jai Singh II at Delhi,
and at Jaipur, which were built in the
1700’s.

Returning to Smiley’s second point,
there are many reasons why an east-
west alignment cannot be accurately
established. The angular width of the
sun is about 1/2° and moves nearly
1° in azimuth per day at the equinoxes,
giving immediately a 1 1/2° error between
sunrise and sunset. This azimuthal
difference is reversed between the two
equinoaxes but is not the sole source
of error. The east-west condition is
met only when the line of sight to
the sun is a tangent to the earth’s
surface. The altitudes of the horizons
perturb the result, which is also affected
by the refraction of the earth’s atmo-
sphere. Furthermore, the refraction
effect is different at sunrise and at
sunset. It is therefore a fair conclusion
that the east-west alignments show
instead the Egyptians’ well-known
ability to construct right angles.

It is obvious that some questions will
always be unanswerable and are thus
of little use. As in many aspects of
archeology, questions must be framed
so as to give scope for objective tests.
In the present case, if we can establish
that a 1’ accuracy was not impossible,
then the next stage of the debate is
with the geophysicists.

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References

Delayed Publication

The swiftness of publication of the
work of the late 19th century scien-
tists cited by Brecher (Letters, 12 Jan.,
p. 128) is impressive. Nevertheless, in
the case of Alfred Russel Wallace’s
paper “On the law which has regulated
the introduction of new species,” one
must add another parameter—geo-
ographical distance. Written in Sarawak
The second volume of this informative series of half-hour conversations between scientists and science journalists is now available. Scientists talk about their work with particular insight into a variety of topics of interest and concern. These twelve dialogues have been compiled by the AAAS and edited onto six audiotape cassettes and packaged in an attractive album.

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