spectronic 100...where else can you get this much spectrophotometer for the money?

Splendid singularity

The Spectronic® 100 overwhelms everything in its price range—on every count.

Non-stop wavelength
The Spectronic 100 goes uninterrupted from 325-925nm. Phototubes, stray light and second order filters interchange automatically. You turn the wavelength knob, the Spectronic 100 does the rest.

Multi-Mode readout
The Spectronic 100 has a four-place digital readout in all three modes: Linear Absorbance, Transmittance and Concentration. With selectable positioning of the decimal point, and scale expansion in Concentration.

Substantial stability
We designed the Spectronic 100 as an a-c system and gave it some hard-to-beat stability specs, such as better than 0.001A short term, and less than 0.001A/hr. long term. And less than 0.2% T/day electronic zero drift.

Laudable linearity
Who else can smooth a curve like this? Linearity specs are 0.2% in Transmittance, 0.001A from 0.000A-0.500A, 0.002A from 0.500A-1.000A, 0.003A from 1.000A-1.500A, 0.004A from 1.500A-2.000A.

Instrument know thyself!
We built into the Spectronic 100 a unique and exclusive Function Control System. It provides a quick and easy performance checkout. Run through the six steps and you'll know you're getting electronic performance—right to specification.

Unsurpassed scope of sampling options
There's never been this much sampling versatility before. Choose from a universal test tube adapter, interchangeable single-cell, multiple-cell, standard micro flow-thru and water-jacketed micro flow-thru compartments. There's virtually no glassware restrictions either. It'll take test tubes up to 22mm; semi-micro, short path, water-jacketed, flow-thru, rectangular or square cuvettes; long path cylindrical cells up to 100mm. And regardless of cell used—it's always precisely positioned in the optical path.

Status symbols
A real human engineering touch on the Model 100-8—the two status lights that provide positive immediate sampling mode identification. They tell you at a glance whether your sample is in, out, or ready to be purged.

The urge to purge
Our Model 100-8 also has a unique self-purging sampling system with zero-error logic that eliminates cross contamination of samples.

And that's only part of the story of the splendid singularity of the Spectronic 100.

We'll gladly send you Catalog 33-6031 listing all outstanding specifications. Or, you might enjoy an enlightening demonstration. Write Analytical Systems Division, Bausch & Lomb, 9010-12 Linden Avenue, Rochester, New York 14625.
(Don't clip this invaluable listing of new high specific activity labeled ribo- and deoxyribonucleotides. Ask us for a spare copy instead.)

### Invaluable Listing

<table>
<thead>
<tr>
<th>Ribonucleotides (&quot;C&quot;)</th>
<th>Specific Activity (mc/mM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenosine 5'-Triphosphate (Crystalline) (8 &quot;C) Na&lt;sup&gt;2&lt;/sup&gt;</td>
<td>15-25</td>
</tr>
<tr>
<td>Adenosine 5'-Triphosphate (8 &quot;C) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>35-50</td>
</tr>
<tr>
<td>Adenosine 5'-Triphosphate (8 &quot;C) Na&lt;sup&gt;2&lt;/sup&gt;</td>
<td>35-50</td>
</tr>
<tr>
<td>Cytidine 5'-Triphosphate (2 &quot;C) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>20-35</td>
</tr>
<tr>
<td>Guanosine 5'-Triphosphate (8 &quot;C) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>35-50</td>
</tr>
<tr>
<td>Uridine 5'-Triphosphate (2 &quot;C) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>20-35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ribonucleotides ('H)</th>
<th>Specific Activity (c/mM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenosine 5'-Triphosphate (8 'H) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>12-15</td>
</tr>
<tr>
<td>Cytidine 5'-Triphosphate (5 'H) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>5-15</td>
</tr>
<tr>
<td>Guanosine 5'-Triphosphate (5 'H) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>1-1.5</td>
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<tr>
<td>Uridine 5'-Triphosphate (5 'H) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>10-25</td>
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</table>

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<tr>
<th>Deoxyribonucleotides (&quot;C&quot;)</th>
<th>Specific Activity (mc/mM)</th>
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</thead>
<tbody>
<tr>
<td>Deoxyadenosine 5'-Triphosphate (8 &quot;C) Na&lt;sup&gt;2&lt;/sup&gt;</td>
<td>30-50</td>
</tr>
<tr>
<td>Deoxycytidine 5'-Triphosphate (2 &quot;C) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>30-50</td>
</tr>
<tr>
<td>Deoxyguanosine 5'-Triphosphate (&quot;C) Li&lt;sup&gt;2+&lt;/sup&gt; (U)</td>
<td>200-250</td>
</tr>
<tr>
<td>Thymidine 5'-Triphosphate (2 &quot;C) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>40-50</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Deoxyribonucleotides ('H)</th>
<th>Specific Activity (c/mM)</th>
</tr>
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<tbody>
<tr>
<td>Deoxyadenosine 5'-Triphosphate (8 'H) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>5-15</td>
</tr>
<tr>
<td>Deoxycytidine 5'-Triphosphate (5 'H) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>15-30</td>
</tr>
<tr>
<td>Thymidine 5'-Triphosphate (methyl 'H) Li&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>5-15</td>
</tr>
</tbody>
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### Noteworthy Facts of Some Importance

1. Schwarz/Mann was the first to make labeled ribo- and deoxyribonucleotides available commercially.
2. These compounds have a very high specific activity. See for yourself: look up.
3. Schwarz/Mann has the widest selection of labeled nucleotides, and what's especially nice about this selection is that it's actually available.
4. Mono- and diphosphates labeled with 'H and "C are also available.
5. Highest available purity.
6. And do you know about the Schwarz/Mann reassay program? (Very important from your standpoint.) Every batch of every radiochemical in the house is reassayed after being in stock for ten weeks and at appropriate intervals thereafter. Any batch showing a breakdown in excess of 3% from specification is withdrawn from stock. Always. You are thereby protected—as we are—from low purity material. All the reassay data also goes onto the Product Analysis Report which contains all of the other analytical information pertaining to the material you receive. Comforting.
7. Finally, please note: all of these labeled nucleotides (plus others) are also available unlabeled.

### Offer

Now send for a spare copy of our nucleotide listing for your file, wall, or desk. We'll send all the current prices, too. Simply write "Nucleotides" on a postcard. To get our big new Radiochemical and Biochemical Catalogs, just add the word "Catalogs." Please remember to include your name, address, and zip code. Write Schwarz/Mann, Division of Becton, Dickinson and Company, Mountain View Avenue, Orangeburg, New York 10962.
meet existing needs. What society, including the academic community, needs is not a new degree but rather stronger Ph.D. and master’s degrees which prepare candidates to teach and carry on significant original research.

Individuals trained primarily in methodology of instruction are generally poorly prepared to effectively convey the excitement of discovery and creativity unless they have been active participants in original investigations. The best college instructors are those who are engaged in a balanced program of instruction and research. Parenthetically, the ability to critically read literature in a field is greatly enhanced by involvement in original research, and such an ability is an essential part of the educational process.

While the new degree might theoretically solve some of the problems of state and junior colleges, it would do absolutely nothing to solve the problem of the university instructor who must be engaged in original research as well as an effective teaching program. At a time when public support of original research is diminishing and the research-oriented Ph.D. is being placed in a classroom and asked to produce or to seek a position elsewhere, it is even more imperative that Ph.D.’s, who are trained at a great deal of expense, have the preparation and training to be effective instructors as well as effective researchers. One cannot and should not separate teaching from research.

JOHN B. JENKINS
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I trust that physical and biological scientists will not support the Doctor of Arts program proposed by Stever which bypasses the candidate who is discovering new knowledge in his field. Instead the candidate evolves teaching materials and strategies and “develops evaluating instruments, and tests his material in class. The work is carried out in the major-subject department. . . .”

I suggest that the candidates who choose this route are even less likely to be equipped to work in this area of the behavioral sciences. Developing reliable, valid, and unbiased evaluating instruments to assess students’ behavior is a challenging technical task. There are standards for data and observations in the behavioral sciences that need to be met. Furthermore, to test instructional processes and curricula in classroom rooms requires sophisticated behavioral science research designs involving protection against internal and external validity threats atypical to the physical sciences.

There are scientific questions that should be answered, however, concerning the effectiveness of instructional methods and curricula in the “hard” sciences. For instance, why should physical or biological science courses be required of students in the secondary schools, in college, and often included in the lower grades? Is it to learn the elementary facts and principles of a science, or scientific method, thinking habits, and attitudes? Yet even physical and biological research scientists evaluating science curricula often make quite unscientific statements with little regard to the quality of the behavioral science data. Can those who choose not to discover new knowledge in their own fields do research in another?

WILLIAM ASHER
Department of Education, Purdue University, Lafayette, Indiana 47907

It will not be easy to change the pattern of earning advanced degrees in the sciences. As of March 1970, only three institutions, including Carnegie-Mellon, were granting the Doctor of Arts degree and only one of those offered it in the sciences (University of North Dakota). The problem is one of acceptability: the degree is not marketable in science departments for a variety of reasons and especially in the buyer’s academic marketplace.

A study last year by the Commission on Undergraduate Education in the Biological Sciences revealed considerable interest in programs aimed toward improving college teaching. Some distinguished, strongly research-oriented biology departments are modifying the Ph.D. program to permit research on curricular innovation in lieu of the traditional thesis. Of more immediate consequence are the expanding programs to improve training for teaching assistants. Nearly 70 percent of all Ph.D.’s in biology become college teachers and only 10 percent publish 90 percent of the research papers. Thus, the time is long overdue for alternatives within the Ph.D. program to prepare scientists for teaching—the job which most of them choose.

EDWARD J. KORMONDY
Commission on Undergraduate Education in the Biological Sciences, 3900 Wisconsin Avenue, NW, Washington, D.C. 20016

22 JANUARY 1971
Reporting on HEW's demand that the University of Michigan stop discriminating against women, Bazell (20 Nov., p. 834) asserts: "The women's liberation movement has a new ally: the Department of Health, Education, and Welfare." A most interesting claim, considering the record of NIH, an organization over which HEW is said to exercise some control.

Membership in one of the NIH Public Advisory Groups is a valued form of professional recognition to most scientists, and also provides opportunities for the "challenging interaction with other professionals" that, as Martha White has pointed out ("Psychological and social barriers to women in science," 23 Oct., p. 413), is difficult for many women to achieve. In choosing members for its committees and councils, NIH has a splendid chance to set a good example for its male-oriented client universities.

The NIH Public Advisory Groups directory (1 Jan. 1970) lists the members of 96 advisory groups associated with the several institutes: 914 members, of whom 22 are female. Next comes the members of the review committees of the Career Development Branch: 92 men, 1 woman. Following are the members of the 48 study sections that pass on research grant applications: 662 members, including 17 women. The rest of the book, dealing largely with public health and education, includes seven committees concerned with nurses' training; on these women predominate, 55 to 23. The other 35 groups are more orthodox: 375 men, 17 women.

Aside from the nurse-related groups, there are 192 committees, of which one has three women and eight have two. Most have none. Again excepting the nursing committees, there are 2044 extramural advisers, 1987 of whom are male. That's 97.2 percent.

I am well aware that the number of women qualified to serve on the advisory panels of NIH is limited, and this situation is due in part to the reluctance of most universities to give women a chance to develop their careers. Since HEW is demanding that universities "achieve a ratio of female employment in academic positions at least equivalent to availability," may I suggest that the ratio of females available to serve on NIH committees is better than 2.8 percent. For myself, I am happy to admit my indebtedness to NIH for generous support of my research and for the training of my students (as well as for the privilege of serving on a study section). But NIH as a women's lib "ally"? Give us girls some good reliable enemies!

FLORENCE MOOG
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Origin of Nitrogen

The report by Dalgarno and McElroy ("Mars: Is nitrogen present?" 9 Oct., p. 167) makes some interesting points about nitrogen in the atmospheres of Mars and Earth. However, papers of this sort seem consistently to ignore biological phenomena; the nitrogen now in Earth's atmosphere is mostly, if not entirely, of biological origin. Shouldn't one consider the possibility that on Mars electrical phenomena and ultraviolet light might purge the atmosphere of any nitrogen present and that it would not be restored if Mars lacks any counterpart of our denitrifying bacteria?

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Esoteric Fish

A clonal colony of the naturally gynogenetic teleost, Poecilia formosa (1), has been established in Florida and small numbers are now available for interested investigators. The genetic homogeneity of the colony suggests a usefulness for various biochemical, behavioral (2), and immunological (3) studies.

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R. E. GOSSINGTON
Post Office Box 208, Delray Beach, Florida 33444

References

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