SCIENCE

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Volume 196, No. 4293

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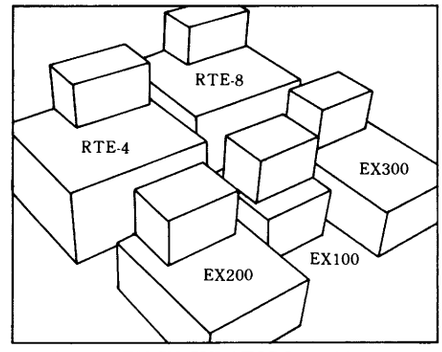

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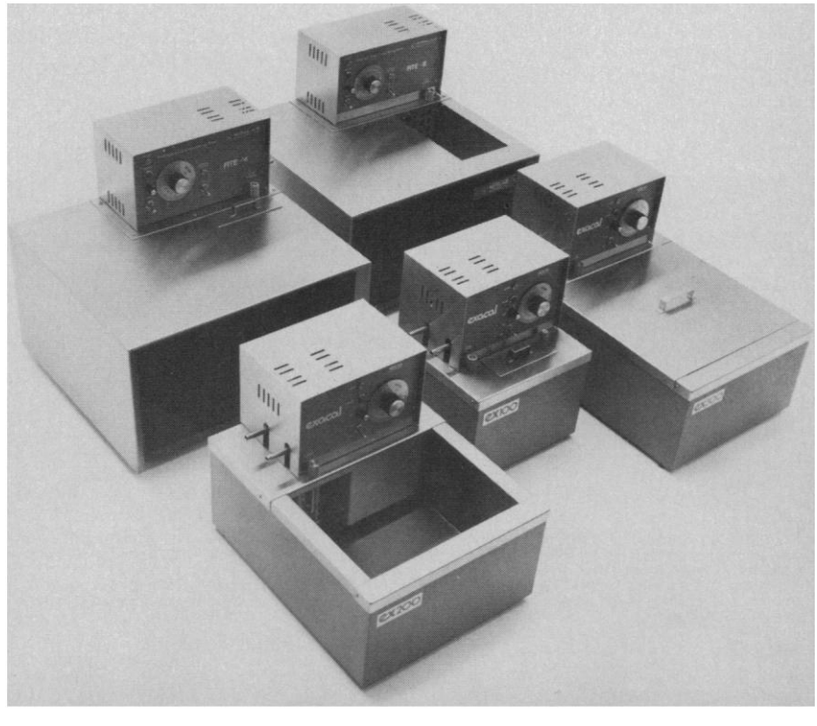

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SCIENCE

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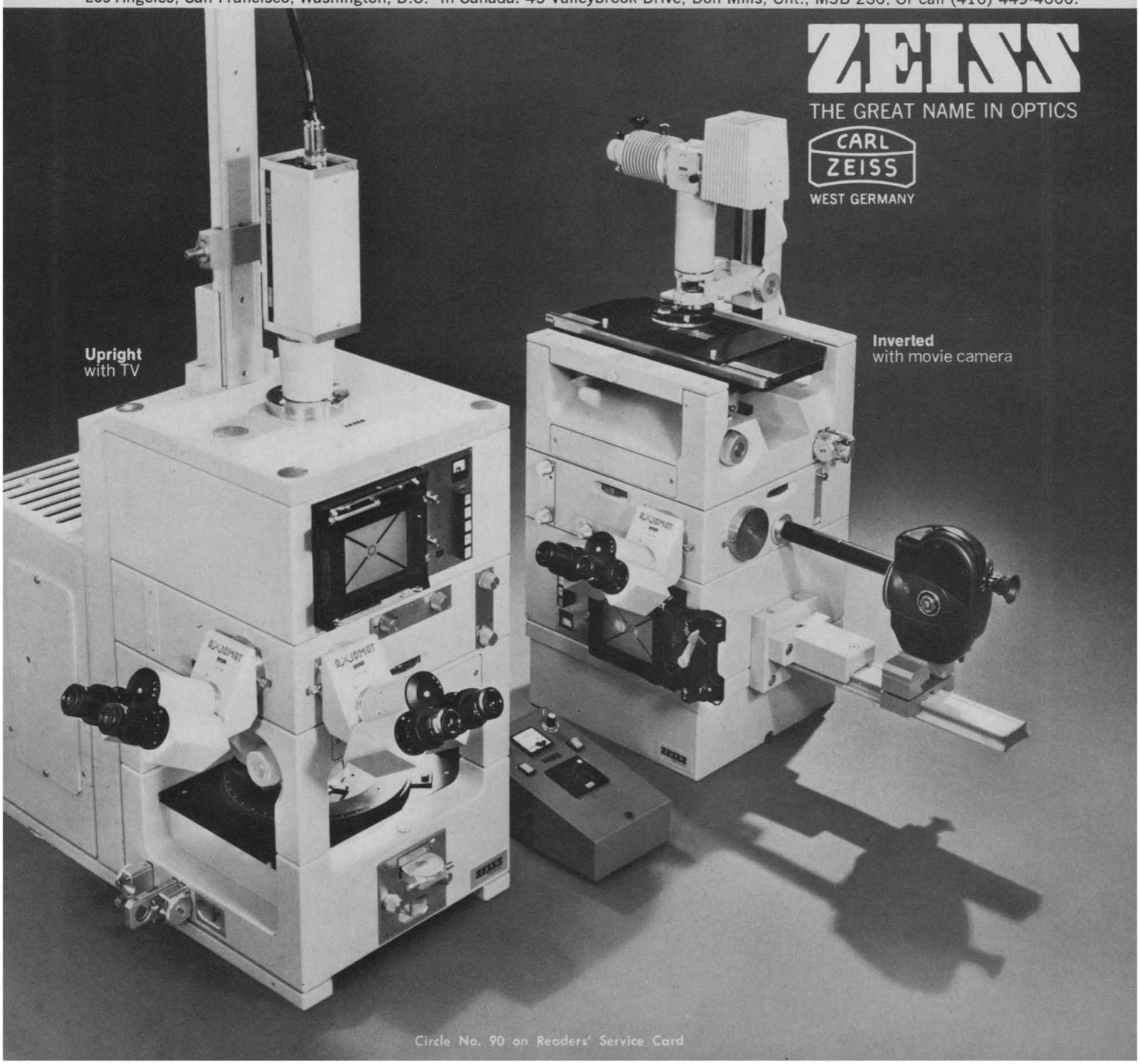

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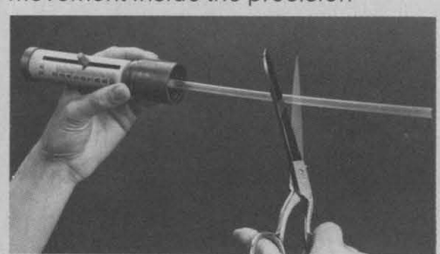

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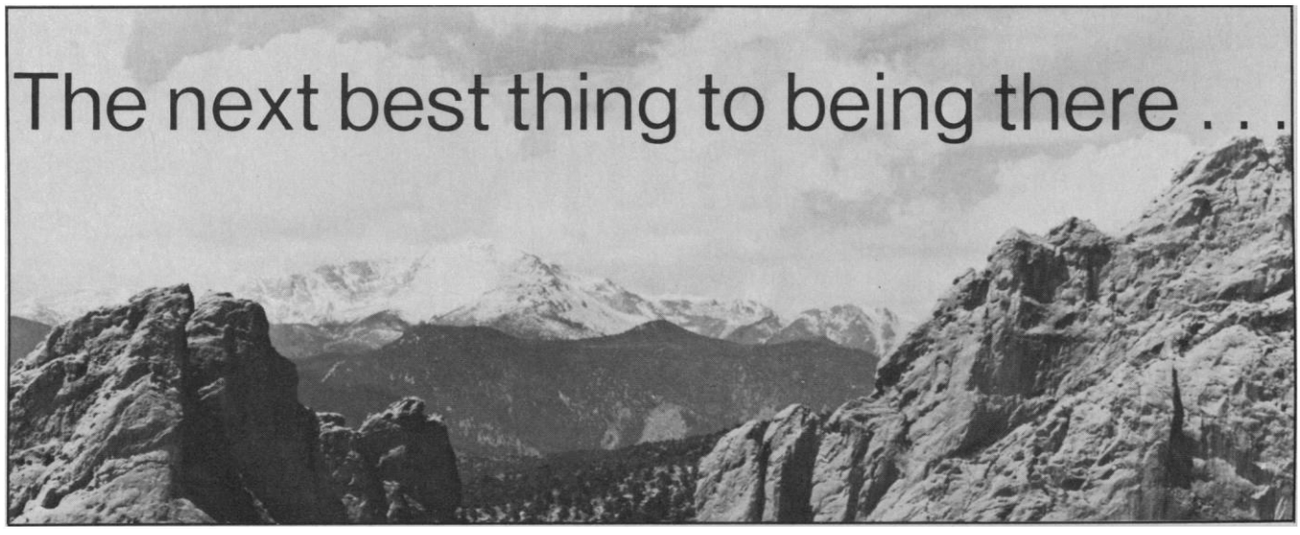

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LETTERS

Paul Erdös: Addenda

The portrait by Gina Bari Kolata of mathematician Paul Erdös (News and Comment, 8 Apr., p. 144) as a man totally devoted to his subject is very well done but lacks a few important details. Although Erdös' devotion to his subject is unlimited, it is not correct to say that his entire attention is given to mathematics. Those who know Erdös well would probably agree that he is also eternally inquisitive and well informed about social, political, cultural, and general scientific matters. All these interests do not detract from his constant preoccupation with mathematics. I recall a long-past incident that illustrates the point. It occurred during a chess game between Erdös and a colleague, who was known as a masterful chess player. As I walked by I saw Erdös' opponent in deep thought about his next move, while Erdös himself seemed to pore over an encyclopedia of medicine that he was holding in his lap. When I asked him what he was studying, he answered, "Please, do not interrupt. I am proving a theorem."

Kolata says that Erdös has never had a regular appointment at a university. However, he did have a research instructorship at Purdue from 1943 to 1945, and later he was a member of the mathematics department at Notre Dame. The scientific community should be informed why his affiliation with Notre Dame was terminated. Late in the summer of 1954, Erdös wished to attend the International Congress of Mathematicians (a quadrennial event), which was meeting in Amsterdam that year. As an alien resident he had to apply for a reentry visa that would allow him to return to the United States after the congress. His request for the visa was rejected, although the administration of Notre Dame claimed him as an essential member of its faculty. He had lengthy hearings with immigration and FBI officials and learned that a voluminous file had been accumulated on his occasional expressions of sympathy for and monetary contributions to various causes, his signing of petitions, his correspondence with foreign mathematicians, and other matters. Erdös decided that he would rather give up the security that he enjoyed at that time than to have his right to travel so arbitrarily restricted. He left the United States officially still on leave from Notre Dame but was not permitted to return. In subsequent years he tried to get a visitor's visa to attend meetings, symposia, and conferences in the United States; his requests were supported by frequent petitions of colleagues, professional organizations, and even U.S. senators. His requests were rejected again and again. I received a letter from him (in 1961 or 1962) saying that he had at last obtained the promise of an American consul that he would receive the visa shortly, but a few weeks later he had to cancel his visit; the promise was disavowed. In his typical style he wrote that the foreign policy of the State Department was adamant on two points: nonadmission of Red China to the United Nations and of Paul Erdös to the United States. Finally, in 1963, he was allowed to attend the annual meeting of the American Mathematical Society in Boulder, Colorado, and to visit several campuses. He also came to Purdue to give a colloquium lecture. The audience included an unusually large number of students who had came to see and greet the famous man. Erdös prefaced his talk with the words: "Sam [the United States] finally admitted me because he thinks I am too old and decrepit now to overthrow him."

It is a sad commentary on our time and country that this man—so totally immersed in scholarly work, so remote from the political arena, a free spirit who lives by the highest moral standards—could be harassed by bureaucrats in high positions whose duty it is to protect our freedoms.

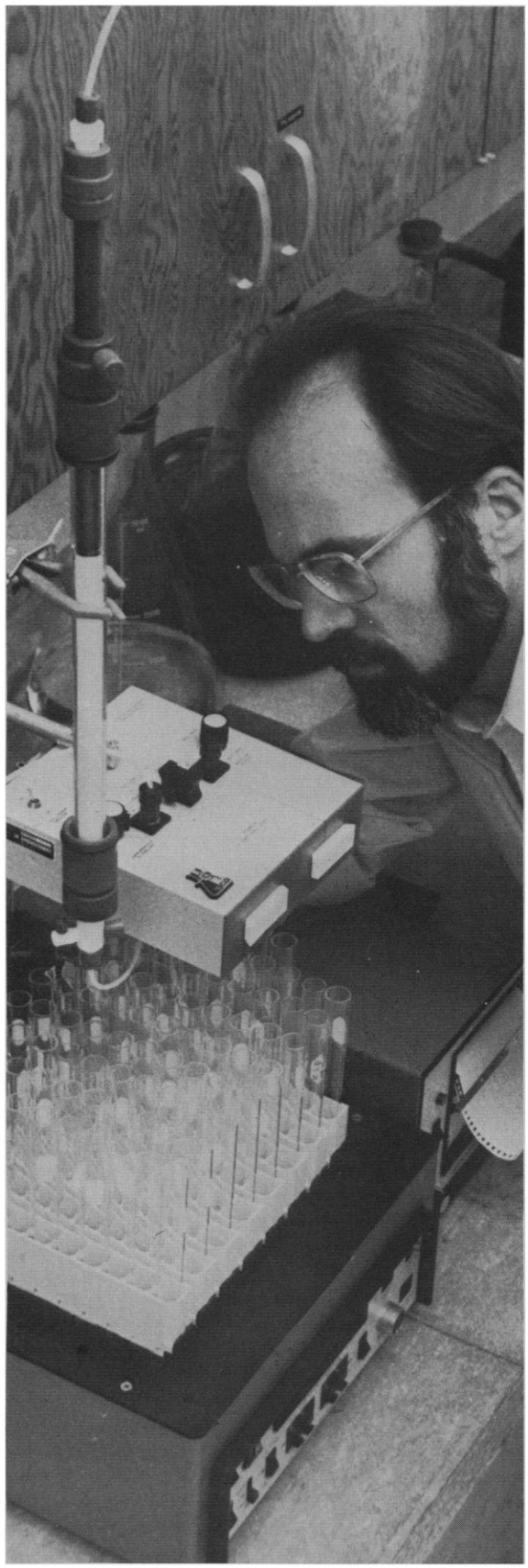
MICHAEL GOLOMB
Division of Mathematical Sciences,
Purdue University,
West Lafayette, Indiana 47907

World Hunger

Deborah Shapley's article about the Antarctic krill (News and Comment, 29 Apr., p. 503) is welcome, and one hopes a new treaty to provide sound management of this marine resource will be concluded *before* commercial fishing for krill gets under way.

It would help greatly, however, if all of us who discuss these needs were more alert to the presumably unconscious determinism involved in such phraseology as Shapley's "the realities of a resource-hungry world" or Gerard Bertrand's "The world need for protein will require the utilization of krill."

These "givens" obscure more significant underlying realities in need of institutional analysis and modification. Why this world hunger? Overpopulation as an answer has become a cliché; it subverts deeper probes. The most neglected sig-



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nificant cause of this imbalance between numbers of people and food supplies seems to be the dispossession of the world peasantry by capital-intensive agriculture that produces for export, not to feed local people (*1*). We cannot manage krill wisely in a socioeconomic vacuum.

ROLAND C. CLEMENT
National Audubon Society,
950 Third Avenue, New York 10022

References

1. J. J. Parsons, *Rev. Biol. Trop.* **24** (Suppl. 1), **121** (1976); J. Belden and G. Forte, *Toward a National Food Policy* (Exploratory Project for Economic Alternatives, Washington, D.C., 1976); E. Feder, *The Rape of the Peasantry: Latin America's Landholding System* (Doubleday Anchor, New York, 1971).

Social Cost

The article by Earl Cook, "Limits to exploitation of nonrenewable resources" (20 Feb. 1976, p. 677), is extremely informative. In fact, I should like to assign it to my class except that it is marred by an egregious fallacy. Since this fallacy has been turning up repeatedly in writings about environmental and natural resource problems, I wish to call it to the attention of *Science* readers.

The mistake has to do with the nature of social cost. Cook, for example, writes "To society . . . the profit from mining (including oil and gas extraction) can be defined either as an energy surplus, as from the exploitation of fossil and nuclear fuel deposits, or as a work saving, as in the lessened expenditure of human energy and time when steel is used in place of wood. . . ." A number of other authors also equate social cost with the expenditure of energy.

For better or for worse, neither kilocalories nor man-hours nor any other directly observable, unidimensional, physical input is an adequate measure of social cost. A moment's thought should make this compelling. Consider a very simple self-contained economy where coal is extracted by surface mining and the coal seams lie under the only land suitable for growing hops. The greater the amount of coal that is surface-mined the less the amount of beer that can be brewed. In these circumstances surface mining may be a loser, socially speaking, even though it requires the expenditure of far less than 12,000 Btu's per pound of coal; and subsurface mining may be advisable even though it requires more energy per pound extracted than surface mining, particularly if there is a beer shortage. The social cost of surface-mined coal includes the reduction in the availability of beer along with the expenditure of man-hours, capital investment, and other things too numerous to mention.

Clearly, then, social costs cannot be measured in calories or any other simple physical units. The only adequate measure is what economists call "social opportunity costs," meaning the social value of the alternative commodities that have to be foregone in order to obtain the commodity being produced. Under certain idealized conditions this opportunity cost is measured by the dollars-and-cents cost of producing the commodity. Under realistic conditions the dollars-and-cents production cost is a fair approximation to the social cost. Under almost any conceivable conditions the dollars-and-cents cost is a much better approximation to social cost than the amounts of energy expended or any other simple physical measure.

Huettner, in his article, "Net energy analysis: An economic assessment" (9 Apr. 1976, p. 101), points out at greater length the inadequacy of energy costs and surpluses as measures of social or economic worth.

It is a great pity that so much valuable work, including Cook's article on the exploitation of mineral resources, is hung up on the fascination with energy problems. Energy is indeed a scarce and valuable resource; but it is only one of many, and there is a good deal more to life and the economy than British thermal units.

ROBERT DORFMAN
Department of Economics,
Harvard University,
Cambridge, Massachusetts 02138

The assault of outraged economist Dorfman leaves me unabashed in my "egregious fallacy." I wrote of energy surplus and worksaving, not of social cost. Energy surplus can be measured in kilojoules. Worksaving can be measured in man-hours. Social cost can be measured adequately in neither, nor even by "social opportunity costs," because the sound of wild birds at dawn and the dignity of man are not measurable commodities.

What is a social benefit to one society may be a social cost to another. If mining is allowed at all, there is an anticipated social profit, an excess of benefits over costs. The primary benefits—unlike the primary costs—are those of energy, whether surplus or saving.

EARL COOK
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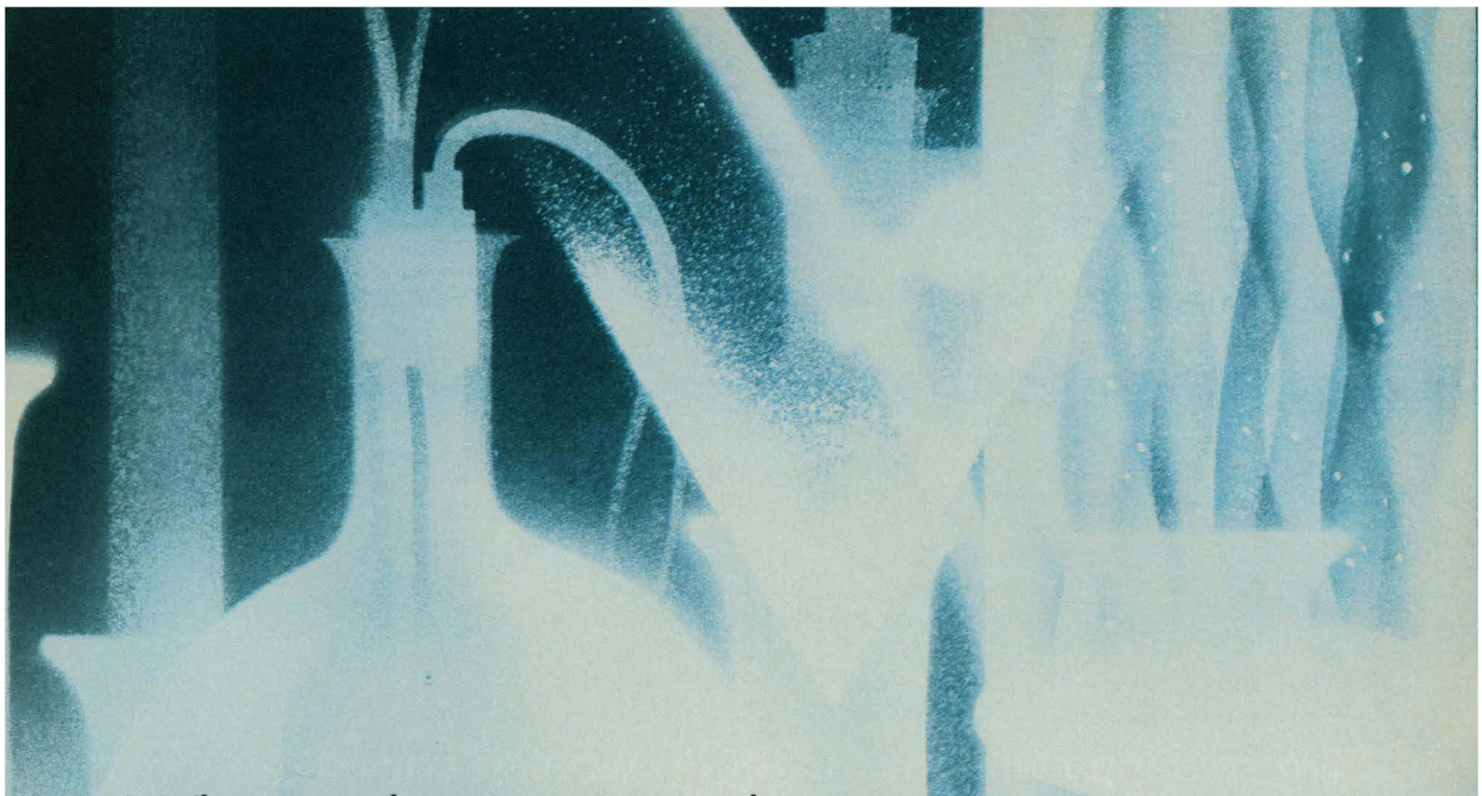

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27 May 1977, Volume 196, Number 4293 **SCIENCE**

Intergovernmental Science and Technology

There is a growing awareness, both in Washington and throughout the country, that if science and technology are to benefit our people more effectively, a better R & D partnership must be established between the federal government and the states, counties, and cities. Properly designed and directed toward state and local needs, federally supported R & D could help to protect regional and local environments, reduce demands on energy and various natural resources, and improve the delivery of state and local services.

In recent years, federal funding of R & D for the civilian sector has been growing rapidly. It is now in excess of $7 billion annually. But its impact on meeting public expectations—on filling the everyday needs of the people—often seems disappointing.

Past intergovernmental science and technology programs have been primarily one-sided affairs, relying heavily on the federal government offering money and off-the-shelf technology to the states and cities with little concern for or understanding of the user's needs. Much of this technology was the spin-off of aerospace and military R & D which might be adaptable to the needs of a local fire or police department or serve some other public need. In addition, there were programs to supply governors and mayors with science and technology advisers.

These efforts at domestic technology transfer in several cases have met with some success. But the residual problems at the state and local levels remain enormous and deserving of a greater effort. Clearly some new stimuli and new approaches are needed.

A feeling is now developing along the lines that intergovernmental action in science and technology must become more of a two-way flow. More initial state and local involvement in setting federal R & D agendas appears to be one way of generating this. Governors, mayors, state legislators, and county and local officials have far better ideas of the problems and the needs of their communities than do Washington officials. They should have more of an input into the decision-making that results in federal R & D budgets in the civilian sector.

A related problem is that much federally generated R & D that might be applicable to public use on a state or local level is not adequately assessed or demonstrated. As a result, its usefulness cannot be properly evaluated. In many cases, research that might ultimately serve a public purpose is not carried far enough into application, implementation, or the federal commercialization stage. This situation could be improved by more attention and closer cooperation between federal and state and local officials concerning research utilization.

There have been some encouraging signs along these lines. The Department of Transportation has become a leader in soliciting views of state and local governments on research needs and in working with them to develop technologies. The National Science Foundation has supported a number of mechanisms including the Urban Consortium and various science networks to strengthen the capacity of state and local governments to use science and technology.

A new thrust toward building a better partnership on a government-wide basis has been the formation of the Intergovernmental Science, Engineering and Technology Advisory Panel as part of the Office of Science and Technology Policy in the Executive Office of the President. This new advisory group, composed of four governors, four mayors, and eight other state and local government officials, is already grappling with ways to improve the intergovernmental science and technology enterprise.—FRANK PRESS, *Director, Office of Science and Technology Policy, Executive Office of the President, Washington, D.C. 20500,* and GEORGE BUSBEE, *Governor, Office of the Governor, Atlanta, Georgia 30334*

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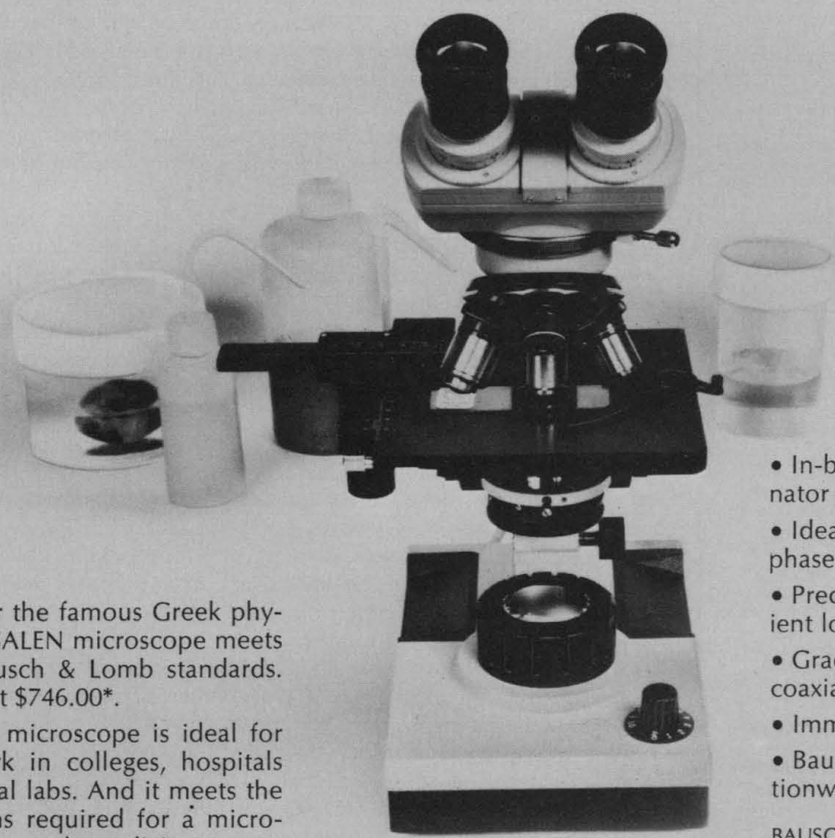

Named after the famous Greek physician, the GALEN microscope meets exacting Bausch & Lomb standards. It is priced at $746.00*.

The GALEN microscope is ideal for routine work in colleges, hospitals and industrial labs. And it meets the specifications required for a microscope used to study medicine.

Compare the quality of the GALEN microscope against any other microscope on the market.

Look into GALEN when you're looking for a microscope:

- Parfocal, coated optics.
- 4x, 10x, 40x, 100x (oil) achromatic objectives.
- Monocular, binocular, triocular models.
- In-base, variable control illuminator (30-watt).
- Ideal for brightfield, darkfield and phase contrast observations.
- Precentered substage with convenient low rack-and-pinion focusing.
- Graduated mechanical stage; low, coaxial controls.
- Immediate off-the-shelf delivery.
- Bausch & Lomb guarantee, and nationwide service.

BAUSCH & LOMB
Scientific Optical Products Division
Optics Center, Dept. 6602
1400 North Goodman Street
Rochester, N.Y. 14602

BAUSCH & LOMB

GALEN

professional microscope

*Monocular model $746, Binocular model shown $895.

BAUSCH & LOMB
Scientific Optical Products Division
Optics Center, Dept. 6602
20717 North Goodman Street
Rochester, N.Y. 14602

☐ Have my B&L dealer contact me to arrange a convenient, free demonstration. ☐ Send catalog 31-2439.

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GALEN. The scope of a more productive laboratory.

Circle No. 73 on Readers' Service Card

SYBRON | Nalge

Nalgene® Labware Showcase '77

This is a pull-out section of some of the newest Nalgene laboratory products, along with the old favorites, from our complete line of over 250 products which can be seen in our 1977 catalog.

Looking Inside Nalgene® Labware

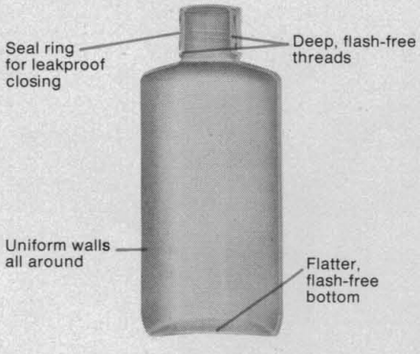
or:

How to get your money's worth when you buy labware

Today you can't afford to waste a cent when making laboratory purchases. All labware, especially plastic labware, is not alike. Illustrated below are just a few of the unique features built into Nalgene labware to give you better, longer service for your money.

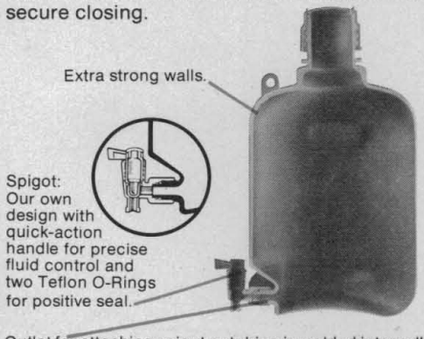
BOTTLES (30-1000ml)

For this size range we use a new process combining both injection- and blow-molding to get more uniform, cleanly molded, precise-volume bottles. Even the closures are engineered for better performance.



"LARGEWARE" (½ to 13 gallons)

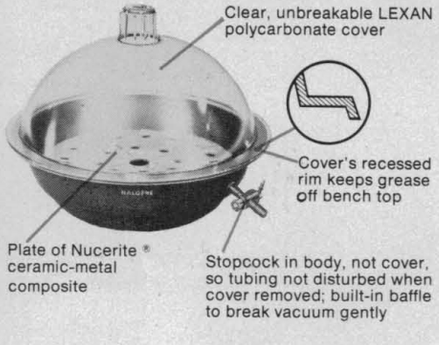
Our large bottles and carboys are blow-molded with extra strong walls, semi-buttress threads and linerless closures for contamination-free, secure closing.



Outlet for attaching spigot or tubing is molded integrally with the rest of the carboy to prevent the leakage common with other brands having welded-on outlets. Outlet lower on bottle for complete drainage.

Implosion-Proof

VACUUM DESICCATOR



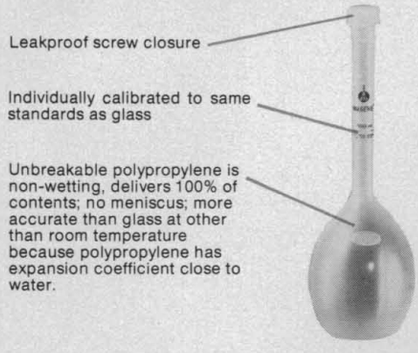
A "Best-Buy"

SAFETY SHIELD

Designed in consultation with one of the nation's leading laboratory safety specialists

Precision-Calibrated

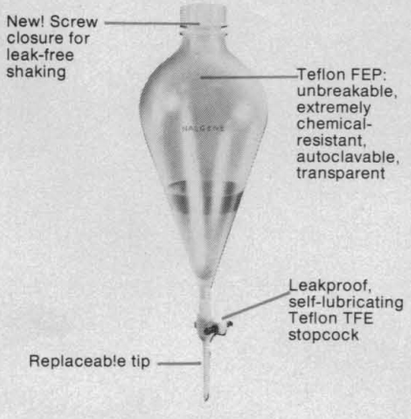
VOLUMETRIC FLASK



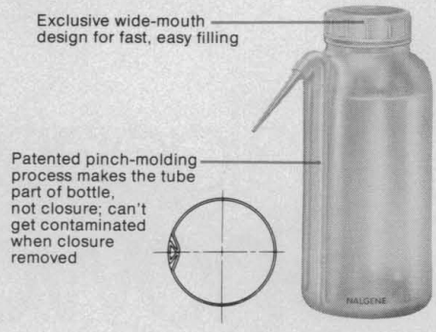
The World's Only Teflon

SEPARATORY FUNNEL

Nalge is a pioneer in making Teflon labware and this sep funnel is the nearest thing yet to permanent labware.



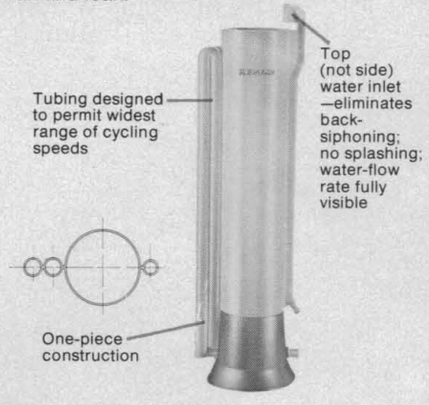
WASH BOTTLE



The World's Only "One-Piece"

PIPET WASHER-RINSER

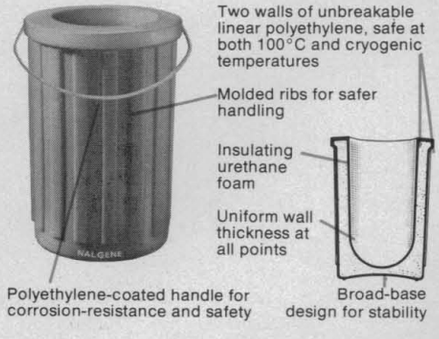
The same pinch-molding process makes all tubing integral with the rinser body; no welds to fail and leak.



All-Plastic, Unbreakable

DEWAR FLASK

Our rotational-molding facilities and experience are used to make Dewars that are not only functional at extreme temperatures—they're also SAFE!



Dozens of innovations, a continuous product improvement program, 62 new products in the last five years, with more to come— these are the reasons you should specify Nalgene Labware by name . . . and make sure you get it.

WHEN YOU WANT QUALITY, SPECIFY NALGENE LABWARE . . . AND MAKE SURE YOU GET IT

NALGENE FILTER UNITS [T]

polystyrene; nitrocellulose membrane

• A complete, disposable, nontoxic, ***presterilized*** membrane filter system ready for immediate use . . . filter cup, cover, support plate, porous support, 115 ml capacity suction flask with cotton-plugged sidearm (flask graduated from 20 to 115 ml), and membrane filter. Uncomplicated design avoids sources of error and contamination. Bagged individually. Package also contains an adapter for connecting the units to a vacuum source (Nalgene Hand-Operated Vacuum Pump is suitable). Eliminates cumbersome glass and metal filtration assemblies, and all the labor and time of setting up and sterilizing. Membranes are free of plasticizers and other extractables. No need to handle sterile membranes—avoids breakage.

Available with either a plain membrane—0.20 micron porosity, or a grid membrane—0.45 and 0.80 micron porosities. U.S. Patent No. 3,295,686

Cat. No. 120-0020; with 0.20 micron membrane, plain
Cat. No. 245-0045; with 0.45 micron membrane, green grid
Cat. No. 380-0080; with 0.80 micron membrane, black grid
Price, per pkg. of 12 . . . . . 23.00

QUANTITY PRICES:
Price, per case of 6 pkgs. (72 units) . . . . . 131.10 per case
5-19 cases assortable porosities . . . . . 124.20 per case
20 cases assortable porosities . . . . . 117.30 per case

Case prices reflect following discounts: 1-4 cases, 5%; 5-19 cases, 10%; 20 or more cases, 15%.

NOT ASSORTABLE

Presterilized and
individually packaged
for immediate use.

NALGENE FILTER UNIT HOLDER [T]

acrylic

• Attractive, convenient, transparent and sturdy. The filter unit holder is designed to free your hands while filter units are attached to a vacuum source. Filter units are held firmly in place but are easy to insert and remove without binding. Will hold three filter units at one time.

Cat. No. 400	**-1000**
Dim., in.	10 x 3½ x 2
Price, each	11.00
Price, per case of 4	39.60

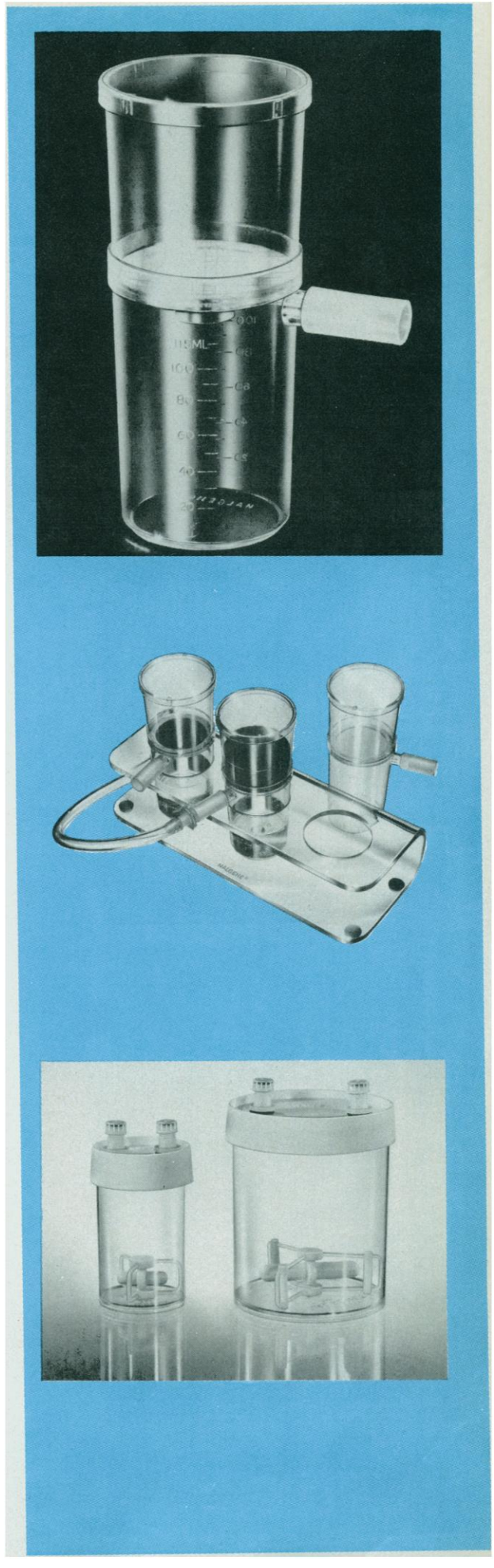
NOT ASSORTABLE

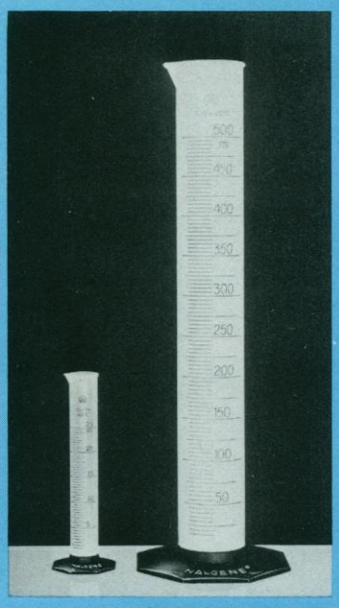
NALGENE SUSPENSION CULTURE FLASK [A] [T]

PMP flask; polypropylene screw closure;
Teflon floating stir bar; silicon gaskets

• ***New.*** Transparent. All plastic construction. Autoclavable. Fully gasketed. Leakproof. An unbeatable combination for the all-new tissue culture suspension culture flask. The Teflon floating stir bar provides excellent stirring action with no grinding of cells. Two 13 mm openings with nipple closures provide easy access for addition and sampling during cell growth. Wide mouth for easy cleaning.

Cat. No. 620	**-0250**	**-1000**
Capacity, ml	250	1000
Closure, mm	70	120
Nipple closure, mm	13	13
Price, each	32.00	45.00
Price, per case of 2	57.60	81.00

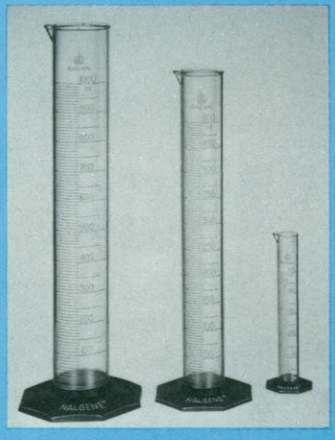


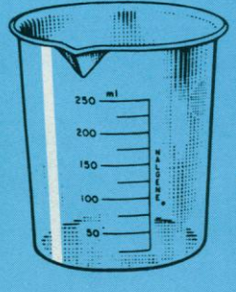


3662-

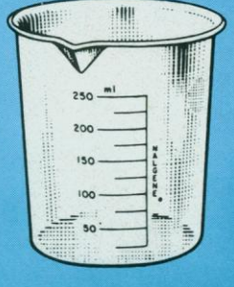
NEW SIZE*

3663-





1203-



1201-

NALGENE GRADUATED WARE

NALGENE PP GRADUATED CYLINDERS Ⓐ

polypropylene cylinder; black polypropylene base

• Precision-molded polypropylene cylinders meet accuracy requirements of Federal Specification NNN-C-940, Cylinder, Graduated, Laboratory; Glass. Ideal for rugged industrial and school lab use. Black molded graduations for easier, quicker reading. No meniscus—easy to read. Calibrated To Contain/To Deliver (TC/TD) at 20°C. Large octagonal base. 10 ml size has conical top. Autoclavable, however autoclaving may affect accuracy. May be sterilized by standard chemical methods. The 2000 and 4000 ml sizes are molded in one piece and have natural-color graduations.

Cat. No. 3662	**-0010**	**-0025**	**-0050**	**-0100**	**-0250**
Cap., ml	10	25	50	100	250
Subdiv., ml	0.2	0.5	1.0	1.0	2.0
Limit of error, ml	0.10	0.30	0.40	0.60	1.4
No. in case	24	18	18	12	12
Price, each	2.90	3.50	3.90	4.40	5.20
Price, per case	62.64	56.70	63.18	47.52	56.16

Cat. No. 3662	**-0500**	**-1000**	**-2000**	**-4000**
Cap., ml	500	1000	2000	4000
Subdiv., ml	5.0	10.0	20.0	50.0
Limit of error, ml	2.6	5.0	10.0	20.0
No. in case	8	6	4	2
Price, each	7.20	9.30	20.00	42.36
Price, per case	51.84	50.22	72.00	76.25

NALGENE PMP GRADUATED CYLINDERS Ⓐ 🅃

polymethylpentene cylinder; black polypropylene base

• Precision-molded polymethylpentene (PMP) graduated cylinders meet accuracy requirements of Federal Specification NNN-C-940, Cylinder, Graduated, Laboratory; Glass. Transparent, shatterproof and heat resistant. Large, easy to read, molded-in graduations. No meniscus—easy to read. Octagonal base helps prevent tipping. Calibrated To Contain/To Deliver (TC/TD) at 20°C. 10 ml size has conical top. Autoclavable, however autoclaving may affect accuracy. May be sterilized by standard chemical methods. The 2000 ml and 4000 ml sizes molded in one piece.

Cat. No. 3663	**-0010**	**-0025**	**-0050**	**-0100**
Cap., ml	10	25	50	100
Subdiv., ml	0.2	0.5	1.0	1.0
Limit of error, ml	0.10	0.30	0.40	0.60
No. in case	24	18	18	12
Price, each	2.96	3.90	4.36	4.90
Price, per case	63.94	63.18	70.63	52.92

Cat. No. 3663	**-0250**	**-0500**	**-1000**	**-2000**	**-4000***
Cap., ml	250	500	1000	2000	4000
Subdiv., ml	2.0	5.0	10.0	20.0	50.0
Limit of error, ml	1.4	2.6	5.0	10.0	20.0
No. in case	12	8	6	4	2
Price, each	6.76	9.26	12.90	21.86	45.00
Price, per case	73.01	66.67	69.66	78.70	81.00

NALGENE GRIFFIN LOW FORM BEAKERS Ⓐ 🅃

polymethylpentene (PMP)

• PMP has the transparency of glass, remarkable heat tolerance, excellent chemical resistance. "No-drip" pouring. Shatterproof. Continuous usage at 150°C, intermittent service to 175°C. Can be autoclaved repeatedly. Nontoxic, noncontaminating, biologically inert. With approximate volume scales molded in. Convenient oval marking area. Tapered walls for safe handling, easy stacking.

Cat. No. 1203	**-0030**	**-0050**	**-0100**	**-0150**	**-0250**	**-0400**	**-0600**	**-1000**	**-2000**	**-4000**
Cap., ml	30	50	100	150	250	400	600	1000	2000	4000
No. in pkg.	12	12	12	12	6	6	4	3	1	1
No. in case	36	36	36	36	24	24	12	12	4	4
Price, per pkg.	4.80	6.00	11.76	14.64	10.14	11.88	13.36	13.20	8.96	13.06
Price, per case	12.96	16.20	31.75	39.53	36.50	42.77	36.07	47.52	32.26	47.02

NALGENE GRIFFIN LOW FORM BEAKERS Ⓐ

polypropylene

• For general laboratory use. Autoclavable. Combine "no-drip" pouring, durability, translucency. Approximate volume scales (conveniently located near pour spout) easily read for right- or left-handed use; molded in. Oval marking area.

Cat. No. 1201	**-0030**	**-0050**	**-0100**	**-0150**	**-0250**	**-0400**	**-0600**	**-1000**	**-2000**	**-4000**
Cap., ml	30	50	100	150	250	400	600	1000	2000	4000
No. in pkg.	12	12	12	12	6	6	4	3	1	1
No. in case	48	48	48	48	36	36	24	12	6	4
Price, per pkg.	3.24	3.96	7.08	8.88	6.24	7.32	9.12	8.46	6.18	10.86
Price, per case	11.66	14.26	25.49	31.97	33.70	39.53	49.25	30.46	33.37	39.10

Send for the 1977 Nalgene® Labware Catalog. Circle R.S. No. 131

NALGENE WASH BOTTLES

NALGENE WIDE MOUTH UNITARY™ WASH BOTTLES†

conventional polyethylene; polypropylene screw closures

• The only ***wide mouth*** wash bottle for faster, easier filling. The 750 ml size is big enough for real convenience, but slim enough around the waist for an easy grip. Wide-mouth bottle and tubulation molded in one piece,† eliminating any possibility of leakage. No messy delivery tube to get bench wet. Entire contents can be dispensed without tipping or shaking. Dispensing tip gives fine stream or can be cut back to increase flow.

Cat. No. 2402	**–0125**	**–0250**	**–0500**	**–0750**	**–1000**
Cap., ml	125	250	500	750	1000
Screw cap size	24	43	48	48	53
No. in pkg.	6	4	4	4	2
No. in case	48	36	24	24	12
Price, per pkg.	5.88	4.48	5.40	6.60	3.92
Price, per case	42.34	36.29	29.16	35.64	21.17

†U.S. Patents No. 3,398,427 and 3,534,435. Canadian Patent No. 901,540.

NALGENE SAFETY WASH BOTTLES

red conventional polyethylene; red polypropylene screw closures

• Bottles molded of red polyethylene—instantly recognized. Vertically ribbed surface insures accurate identification by touch also. Indicate inflammable or dangerous contents . . . reduce the hazard of picking the wrong bottle. Delivery tube is through the shoulder. Screw cap size is 24 mm.

Cat. No. 2404	**–0250**	**–0500**
Cap., ml	250	500
No. in case	36	24
Price, per pkg. of 4	6.44	7.68
Price, per case	52.16	41.47

NALGENE DISPENSERS AND DROPPERS

NALGENE DROP-DISPENSER BOTTLE Ⓐ 🅃

Teflon FEP; Teflon ETFE dropping closure and plug

• ***New.*** Only drop-dispensing bottle available made of Teflon FEP and ETFE . . . handles virtually any chemical you need to dispense. Autoclavable. One per package.

Cat. No. 2414	**–0030**
Cap., ml	30
Price, each	10.00
Price, per case of 4	36.00

NALGENE SEPARATORY FUNNELS

NALGENE SQUIBB PEAR SHAPE SEPARATORY FUNNELS 🅃

Teflon FEP; Teflon TFE plug; Tefzel ETFE screw closure

• ***Improved.*** Teflon has all the qualities to make the perfect separatory funnel; it's unbreakable, non-stick for easy cleaning, non-wetting for complete draining, and impervious to any chemical used in a separatory funnel. The *economical* answer to continual replacement of fragile glass funnels. These funnels are so transparent the phase interface of even colorless liquids such as ether and water can be clearly seen down to the stopcock plug. Ideal for use in radiological and hazardous separations. The leakproof closure is made of Du Pont's "Tefzel" ETFE fluoropolymer; the leakproof stopcock is made of self-lubricating Teflon TFE. Stopcock housing may be removed for easier cleaning. Funnel can be chemically sterilized.

Cat. No. 4301	**–0125**	**–0250**	**–0500**	**–1000**
Cap., ml (nominal)	125	250	500	1000
Closure size, mm	28	33	43	53
Stem length below stopcock, mm	65	65	65	65
Price, each	26.26	31.10	35.60	58.20
Price, per case of 4	94.54	111.96	128.16	209.52

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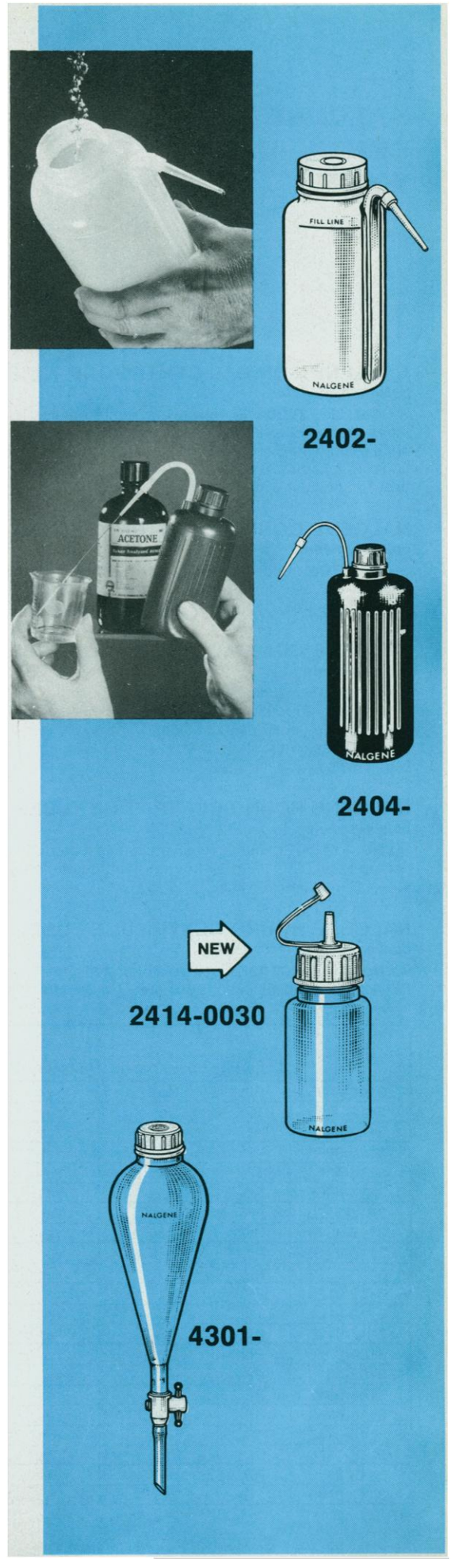
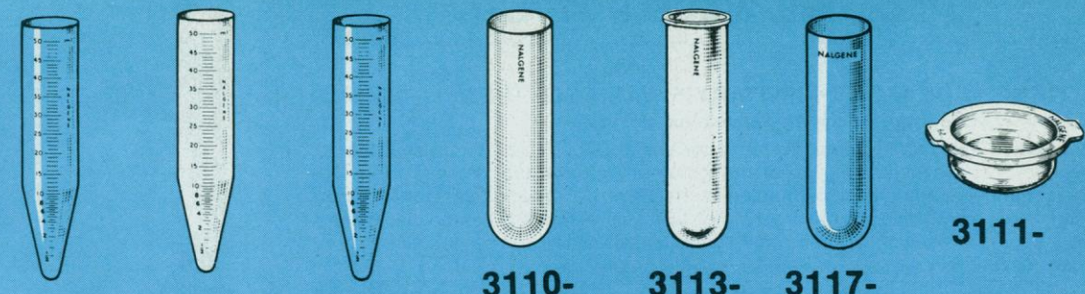


NALGENE CENTRIFUGE WARE



NALGENE CONICAL CENTRIFUGE TUBES Ⓐ 🅃

polymethylpentene

• **Cat. No. 3100-.** For low-speed centrifugation to 3000 x G, these tubes offer autoclavability, transparency and excellent chemical resistance without the danger and nuisance of shattering. Molded-in graduations. 15 ml size takes standard urinometer. Without closures. Capacities: 15 and 50 ml. Autoclavable.

NALGENE CONICAL CENTRIFUGE TUBES Ⓐ

polypropylene

• **No. 3103-.** Excellent chemical resistance. Molded-in, raised graduations. For use up to 6000 x G in all non-refrigerated centrifuges. Without closures. Capacities: 15, 50 ml. Autoclavable.

NALGENE CONICAL CENTRIFUGE TUBES Ⓐ 🅃

polycarbonate

• **No. 3105-.** Outstanding strength. For use up to 6000 x G. Molded-in, raised graduations. 15 ml size also takes standard urinometer. Autoclavable—but repeated autoclaving may shorten the life of polycarbonate tubes. Without closures.
Capacities: 15, 50 ml.

NALGENE ROUND CENTRIFUGE TUBES Ⓐ

polypropylene

• **No. 3110-.** Economical polypropylene tubes. Use as test tubes. For use up to 50,000 x G in all non-refrigerated centrifuges. Without closures. Capacities: 3.5, 6.5, 7, 12, 15, 18, 50, 100 ml.

NALGENE ROUND CENTRIFUGE TUBE

conventional polyethylene

• **No. 3112-0050.** For use in refrigerated centrifuges up to 50,000 x G. Capacity is 50 ml; dimensions are 29 x 104 mm. Without closure.

NALGENE ROUND CENTRIFUGE TUBES Ⓐ

Tefzel ethylene-tetrafluoroethylene

• **No. 3113-.** The centrifuge tube for *maximum reliability* in critical centrifuge procedures. Tefzel ETFE gives these tubes tremendous tensile strength, the chemical resistance of Teflon and resistance to temperatures from −100°C to +180°C. They can be used with *any* solvent in refrigerated centrifuges with the proper size rotor at 50,000 x G when fitted with Nalgene closures. Unlike Teflon TFE tubes, these tubes are translucent. Without closures. Capacities: 3.5, 6.5, 12, 15, 50 ml.

NALGENE ROUND CENTRIFUGE TUBES

polycarbonate

• **No. 3117-.** Stronger than polypropylene and crystal clear. Withstand centrifugal forces up to 50,000 x G even under refrigeration. Repeated autoclaving may shorten life of polycarbonate tubes. Nontoxic, non-contaminating. Without closures. Capacities: 3.5, 6.5, 7, 12, 15, 18, 50, 100 ml.

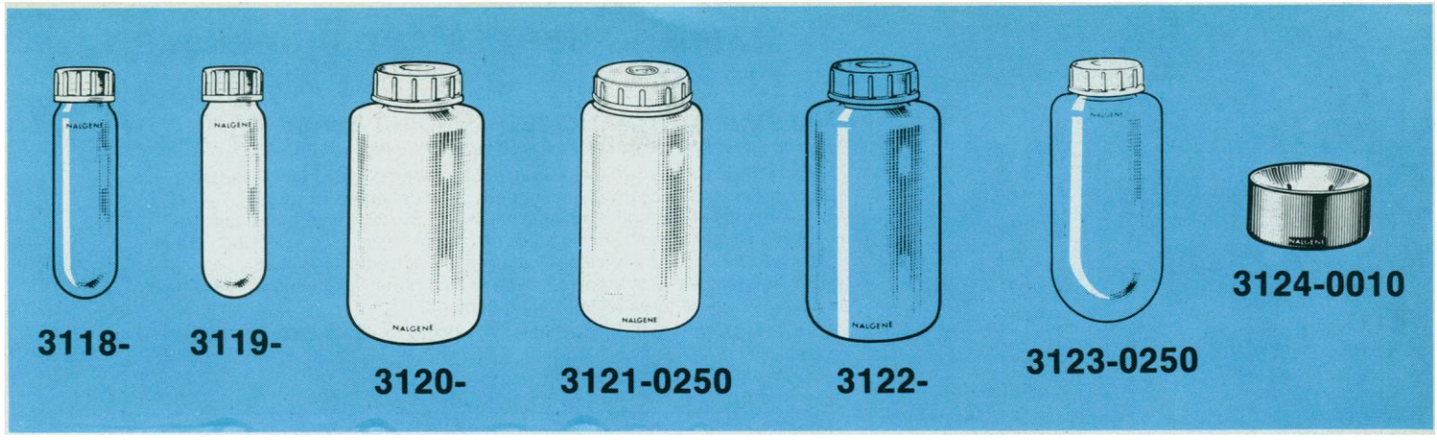
NALGENE TUBE CLOSURES Ⓐ

polypropylene

• New design friction-fit closures for all Nalgene centrifuge tubes. Designed for Nalgene tubes. May not provide liquid-tight seal.

Cat. No. 3111	**-0012**	**-0013**	**-0016**	**-0017**	**-0019**	**-0029**	**-0032**
Closure No.	12	13	16	17C	19	29	32
Price, per pkg. of 20	4.10	4.40	4.80	5.10	5.50	6.60	7.20
Price, per case of 200	36.90	39.60	43.20	45.90	49.50	59.40	64.80

Catalog No.	Material	Transparent	Autoclavable	Capacity ml	Size O.D. x Length	Takes Closure No.	No. in Package	No. in Case	Price per Package	Price per Case
3110-0035	PP	No	Yes	3.5	10.9 x 77	12	10	100	3.10	27.90
3113-0035	ETFE	No	Yes	3.5	10.9 x 77	12	2	10	9.36	42.12
3117-0035	PC	Yes	Yes	3.5	10.9 x 77	12	10	100	4.10	36.90
3110-0065	PP	No	Yes	6.5	12.5 x 101	13	10	100	3.50	31.50
3113-0065	ETFE	No	Yes	6.5	12.5 x 101	13	2	10	9.36	42.12
3117-0065	PC	Yes	Yes	6.5	12.5 x 101	13	10	100	4.30	38.70
3110-0070	PP	No	Yes	7	15.8 x 60	16	10	100	3.50	31.50
3117-0070	PC	Yes	Yes	7	15.8 x 60	16	10	100	4.30	38.70
3118-0010	PC	Yes	Yes	10	16.1 x 79.5	13	10	100	10.40	93.60
3119-0010	PP	No	Yes	10	16.1 x 79.5	13	10	100	8.50	76.50
3110-0120	PP	No	Yes	12	15.8 x 101	16	10	100	3.60	32.40
3113-0120	ETFE	No	Yes	12	15.8 x 101	16	2	10	10.94	49.23
3117-0120	PC	Yes	Yes	12	15.8 x 101	16	10	100	4.70	42.30
3100-0015	PMP	Yes	Yes	15	17 x 119	17C	10	100	7.10	63.90
3103-0015	PP	No	Yes	15	17 x 119	17C	10	100	5.10	45.90
3105-0015	PC	Yes	Yes	15	17 x 119	17C	10	100	6.90	62.10
3110-0150	PP	No	Yes	15	15.8 x 116	16	10	100	3.80	34.20
3113-0150	ETFE	No	Yes	15	15.8 x 116	16	2	10	11.72	52.74
3117-0150	PC	Yes	Yes	15	15.8 x 116	16	10	100	5.10	45.90
3110-0180	PP	No	Yes	18	18.5 x 116	19	10	100	3.90	35.10
3117-0180	PC	Yes	Yes	18	18.5 x 116	19	10	100	6.00	54.00



NALGENE OAK RIDGE-TYPE CENTRIFUGE TUBES Ⓐ 🅃

polycarbonate; polypropylene screw closures

• **No. 3118-.** Leakproof screw caps. Full mouth opening. Withstand over 50,000 x G in suitable rotors. Capacities: 10, 30, 50, 85 ml.

NALGENE OAK RIDGE-TYPE CENTRIFUGE TUBES Ⓐ

polypropylene; polypropylene screw closures

• **No. 3119-.** Similar to the above but polypropylene construction provides greater chemical resistance. Leakproof screw caps. Autoclavable. Not designed for refrigerated centrifuges. Withstand forces to 50,000 x G. Capacities: 10, 30, 50 ml.

NALGENE CENTRIFUGE BOTTLES Ⓐ

polypropylene; polypropylene screw closures

• **No. 3120-.** Fit standard centrifuge cups. Take centrifugal forces up to 13,200 x G in non-refrigerated centrifuges. Frequently used as animal watering bottles. Use Sorvall No. 424 adapter with 250 ml size for best results. Capacities: 250, 500 ml.

NALGENE WIDE MOUTH CENTRIFUGE BOTTLE

linear polyethylene; polypropylene screw closure

• **No. 3121-0250.** Wider mouth than standard centrifuge bottles. For use in refrigerated centrifuges—withstands temperatures down to –120°C, and centrifuge forces up to 8,000 x G. More chemically resistant than polycarbonate. Use Sorvall No. 424 adapter for best results. Dimensions are 61 x 119 mm, with size 43 closure. Capacity 250 ml.

NALGENE CENTRIFUGE BOTTLES Ⓐ 🅃

polycarbonate; polypropylene screw closures

• **No. 3122-.** Excellent dimensional stability. Withstand up to 27,300 x G. Frequently used as animal watering bottles. Use Sorvall No. 424 adapter with 250 and 290 ml sizes for best results. Capacities: 250, 290, 500 ml.

NALGENE SPHERICAL-BOTTOM CENTRIFUGE BOTTLE Ⓐ 🅃

polycarbonate; polypropylene screw closure

• **No. 3123-0250.** Withstands forces up to 27,500 x G. Use Nalgene support listed below. In 250 ml size only. Dimensions are 61.7 x 136 mm, with size 38 closure.

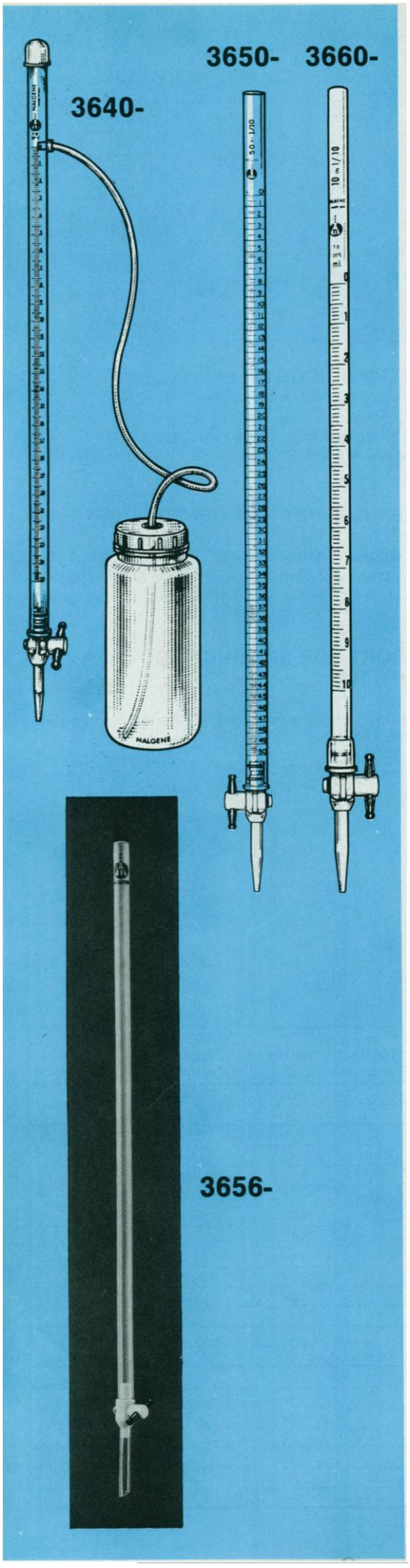
NALGENE SUPPORT FOR SPHERICAL-BOTTOM CENTRIFUGE BOTTLE Ⓐ

blue polycarbonate

• For use in standard centrifuge rotors with spherical-bottom centrifuge bottles, diameter 61.7 mm.

Cat. No. 3124	**–0010**
Price, per pkg. of 4	8.12
Price, per case of 12	29.92

Catalog No.	Material	Transparent	Autoclavable	Capacity ml	Size O.D. x Length	Takes Closure No.	No. in Package	No. in Case	Price per Package	Price per Case
3118-0030	PC	Yes	Yes	30	25.7 x 92	20	10	100	11.40	102.60
3119-0030	PP	No	Yes	30	25.7 x 92	20	10	100	9.80	88.20
3100-0050	PMP	Yes	Yes	50	28.7 x 134	29	10	100	12.80	115.20
3103-0050	PP	No	Yes	50	28.7 x 134	29	10	100	6.90	62.10
3105-0050	PC	Yes	Yes	50	28.7 x 134	29	10	100	10.30	92.70
3110-0500	PP	No	Yes	50	28.7 x 103	29	10	100	4.30	38.70
3112-0050	CPE	No	No	50	29 x 104	29	10	100	5.70	51.30
3113-0500	ETFE	No	Yes	50	28.7 x 103	29	2	10	14.06	63.27
3117-0500	PC	Yes	Yes	50	28.7 x 103	29	10	100	6.40	57.60
3118-0050	PC	Yes	Yes	50	28.6 x 104	24	10	100	13.80	124.20
3119-0050	PP	No	Yes	50	28.6 x 104	24	10	100	12.20	109.80
3118-0085	PC	Yes	Yes	85	38.1 x 101	33	10	100	15.50	139.50
3110-1000	PP	No	Yes	100	31.5 x 164	32	10	40	10.30	37.08
3117-1000	PC	Yes	Yes	100	31.5 x 164	32	10	40	15.70	56.52
3120-0250	PP	No	Yes	250	61.7 x 122	38	4	36	6.20	50.22
3121-0250	LPE	No	No	250	61 x 119	43	6	36	7.80	42.12
3122-0250	PC	Yes	Yes	250	61.7 x 122	38	4	36	9.80	79.38
3123-0250	PC	Yes	Yes	250	61.7 x 136	38	4	36	12.36	100.12
3122-0290	PC	Yes	Yes	290	61.7 x 137	38	4	36	11.32	91.69
3120-0500	PP	No	Yes	500	73.4 x 163	48	4	24	7.48	40.39
3122-0500	PC	Yes	Yes	500	69.5 x 163.5	48	4	24	16.08	86.83



NALGENE BURETS AND DISPENSERS

NALGENE AUTOMATIC SELF-ZEROING BURET [T]

acrylic body; PMP stopcock and tip; Teflon TFE plug

• Crystal-clear. Easy to use. Durable. Safer than glass. Offers repeatable, accurate results. Individually calibrated, the buret meets accuracy requirements of Federal Specification NNN-B-00789a, Buret, Straight, Precision. *Unaffected by dilute acids and dilute bases used as titrants,* but not designed for exposure to alcohol and organic solvents. Individually packaged, each size includes one automatic self-zeroing buret with cover, squeeze bottle with closure, and three feet of Nalgon tubing.

Cat. No. 3640	**–0010**	**–0025**	**–0050**	**–0100**
Cap., ml	10	25	50	100
Subdiv., ml	0.05	0.1	0.1	0.2
Reservoir, ml	500	500	1000	1000
Price, each	24.00	24.00	26.00	26.00
Price, per case of 4	86.40	86.40	93.60	93.60

NALGENE TRANSPARENT BURETS [T]

acrylic body; PMP stopcock and tip; Teflon TFE plug

• Crystal-clear. Durable. Individually calibrated, they meet Federal Specification NNN-B-00789a, Buret, Straight, Precision. Stopcock is leakproof, with self-lubricating Teflon TFE plug. Excellent for general use, schools, industrial labs and field use. *Unaffected by dilute acids and dilute bases used as titrants,* but not designed for exposure to alcohol and organic solvents.

Cat. No. 3650	**–0010**	**–0025**	**–0050**	**–0100**
Cap., ml	10	25	50	100
Subdiv., ml	0.05	0.1	0.1	0.2
Limit of error, ml	0.04	0.06	0.1	0.2
Price, each	18.50	18.50	18.50	22.00
Price, per case of 4	66.60	66.60	66.60	79.20

NALGENE BURETS Ⓐ

polypropylene; PMP stockcock and tip; Teflon TFE plug

• For use with all titrants. Individually calibrated. Teflon plug won't seize, never needs lubrication. Easily disassembled and cleaned. Has outstanding chemical resistance.

Cat. No. 3660	**–0010**	**–0025**
Cap., ml	10	25
Subdiv., ml	0.10	0.10
Limit of error, ml	0.06	0.10
Price, each	16.24	18.10
Price, per case of 4	58.46	65.16

NALGENE CHROMATOGRAPHY COLUMNS

NALGENE CHROMATOGRAPHY COLUMNS [T]

Teflon FEP tubing; Teflon TFE stopcock and support

• An unbreakable, ***all Teflon*** chromatography column that can be used with all column chromatography reagents—even at elevated temperatures. Transparent. Straight bore assures easy cleaning. Removable stopcock has self-lubricating Teflon TFE plug. TFE support disc can be removed for easy cleaning. Individually packaged.

Cat. No. 3656	**–1130**	**–1150**
Column I.D., mm	11	11
Column length, mm	300	500
Price, each	20.00	24.00
Price, per case of 4	72.00	86.40

NALGENE SIEVES

NALGENE SIEVES

linear polyethylene; polyester mesh

• These large-capacity sieves are available in seven U.S. Sieve Series mesh sizes. The 12" O.D. and 4" depth provide ¼ cubic foot of usable volume. The polyester mesh is durable, uniform and will not corrode in fresh or salt water; won't contaminate samples. The base fits snugly into top of Nalgene Receiver Pan (below). Ideal for field studies by biologists, geologists and others who are concerned about corrosive damage to sieves. These sieves and the pans described below will float—can't be lost at sea. For covers, order No. 5307-0012. Individually packaged.

Cat. No. 4230	**-1205**	**-1210**	**-1218**	**-1230**	**-1235**	**-1240**	**-1260**
U.S. Sieve Series Designation							
Standard	4.000mm	2.000mm	1.000mm	.600mm	.500mm	.425mm	.250mm
Alternate	No. 5	No. 10	No. 18	No. 30	No. 35	No. 40	No. 60
Sieve opening, inches (approx.)	0.157	0.0787	0.0394	0.0234	0.0197	0.0165	0.0098
Price, each	32.06	32.06	32.06	32.06	32.06	32.06	32.06
Price, per case of 2	57.71	57.71	57.71	57.71	57.71	57.71	57.71

NALGENE RECEIVER PAN

linear polyethylene

• For Nalgene Sieves described above. Same excellent chemical resistance and durability. O.D. is 12", overall height 3". Sieves fit snugly into receiver pans to restrict spillage. Individually packaged.

Cat. No. 4233	**-0012**
Price, each	10.00
Price, per case of 6	54.00

NALGENE JARS AND VACUUM EQUIPMENT

NALGENE MULTI-PURPOSE JARS Ⓐ 🅃

polycarbonate

• Use these unbreakable, transparent polycarbonate jars instead of the breakable kind as water baths, aquaria, terraria, freeze-drying chambers, bell jars, etc. You can safely drill, tap or apply clamps to these jars to attach heating and cooling equipment. Do not autoclave if used for vacuum applications. For covers, see below.

Cat. No. 5300	**-0609**	**-0910**	**-0918**	**-1212**
Cap., gal. (approx.)	1	2	3½	4½
O.D. x height, in.	6⅝ x 9¼	8¾ x 10	8¾ x 18	12 x 12
Price, each	14.46	24.08	35.86	37.46
Price, per case of 2	26.03	43.34	64.55	67.43

NALGENE COVERS FOR MULTI-PURPOSE JARS Ⓐ 🅃

polycarbonate

• For the multi-purpose jars above as well as for glass jars of the same diameters. The 6⅝" size fits the 1-gallon No. 5300 Nalgene jars; the 8¾" cover fits the 2- and 3½-gallon jars. The 12" cover fits the 4½-gallon jar and Nalgene sieves. Made of unbreakable, autoclavable, transparent polycarbonate, these covers can be drilled or tapped to accommodate a variety of accessories. Also permit jars to be stacked safely. Individually cartoned.

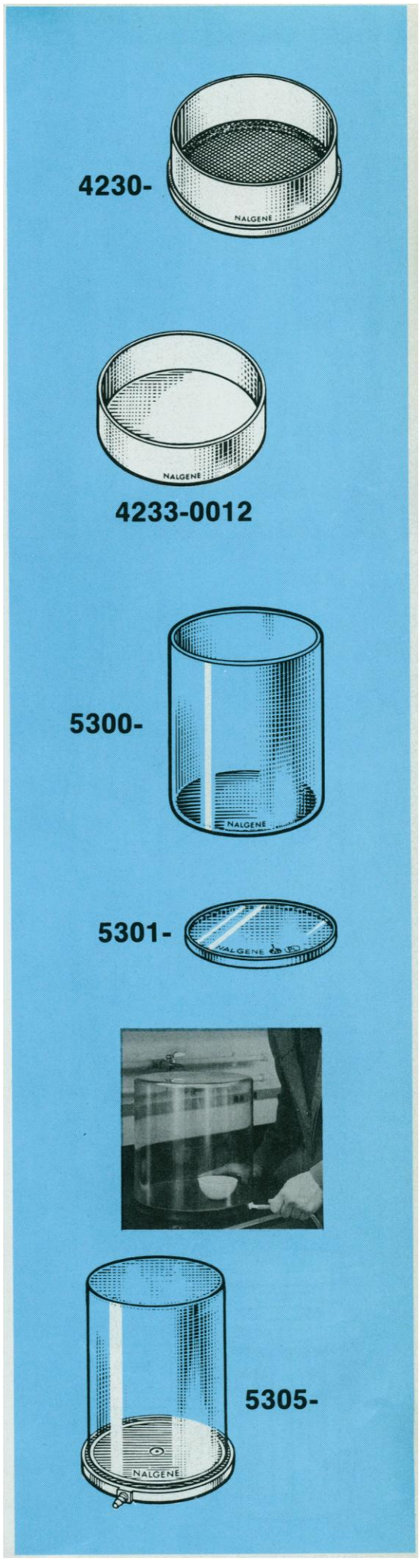
Cat. No. 5301	**-0006**	**-0009**	**-0012**
I.D., in.	6⅝	8¾	12
Price, each	3.48	4.98	6.54
Price, per case of 6	18.79	26.89	35.32

NALGENE VACUUM CHAMBERS 🅃

polycarbonate jars; LPE or polycarbonate plates; neoprene gaskets

• Four complete, versatile vacuum chambers, each consisting of transparent unbreakable No. 5300 "bell jar" and gasketed No. 5306 vacuum plate with ¼" tubing connection at rim. Withstand full vacuum. Use as controlled environment chambers, for degassing operations and freeze-drying. Connect to any convenient vacuum source such as Nalgene Vacuum Pump (Cat. No. 6140-0010) or mechanical pump.

Cat. No. 5305	**-0609**	**-0910**	**-0918**	**-1212**
Cap., gal.	1	2	3½	4½
Jar, O.D. x height, in.	6⅝ x 9¼	8¾ x 10	8¾ x 18	12 x 12
Plate O.D., in. (mat.)	7½ (LPE)	13 (PC)	13 (PC)	13 (PC)
Gasket O.D., in.	7	12⅝	12⅝	12⅝
No. in case	2	1	1	1
Price, each	26.16	43.34	55.12	56.72
Price, per case	47.09	43.34	55.12	56.72



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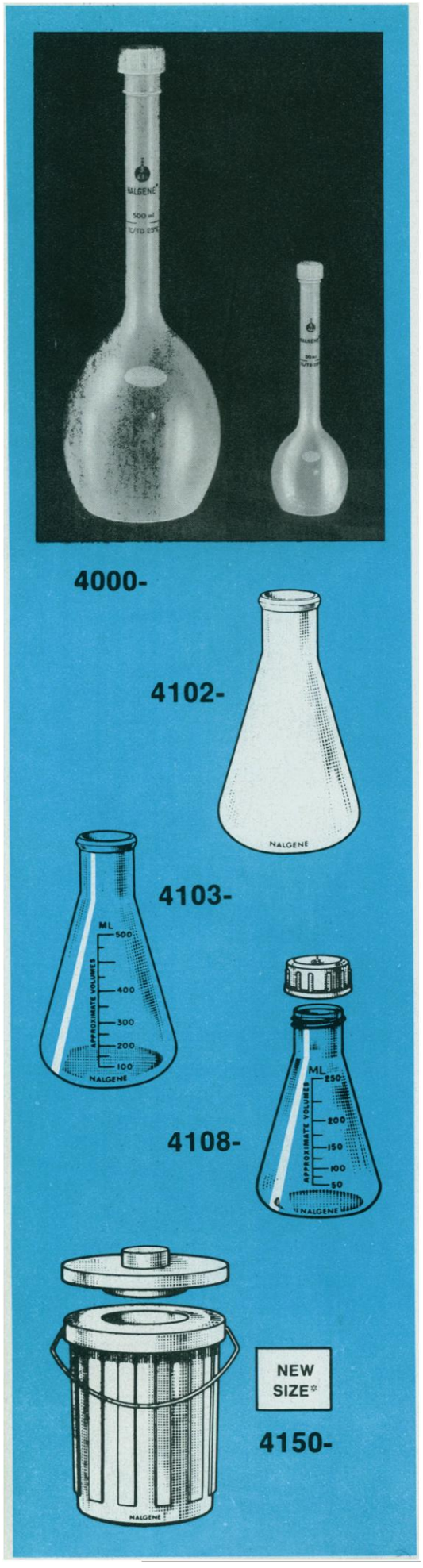

NALGENE FLASKS

NALGENE VOLUMETRIC FLASKS Ⓐ

polypropylene; polypropylene screw closures

• All the accuracy of standard glass flasks combined with the unbreakability of plastics. Each flask individually calibrated To Contain/To Deliver at 25°C, and marked with permanent color graduation line. More accurate than glass at other temperatures. No meniscus to confuse readings. Oval marking spot. Supplied with polypropylene screw closure. 200 ml size has additional graduation line at 203 ml level for BOD and DO determinations. (Flask may easily be cut at 203 ml level to use brim capacity.) Individually packaged.

Cat. No. 4000	**–0050**	**–0100**	**–0200**	**–0250**	**–0500**	**–1000**
Cap., ml	50	100	200	250	500	1000
Limit of error, ml	±0.10	±0.16	±0.20	±0.24	±0.40	±0.60
Ht., mm, with cap	146	184	209	222	279	317
No. in case	12	12	12	12	8	6
Price, each	6.22	6.40	7.48	8.34	9.60	12.80
Price, per case	67.18	69.12	80.78	90.07	69.12	69.12

NALGENE ERLENMEYER FLASKS Ⓐ

polypropylene

• For general laboratory use. For stoppers, see Nalgene Hollow Stoppers. The 25 ml and 2000 ml sizes have molded-in graduations.

Cat. No. 4102	**–0025**	**–0050**	**–0125**	**–0250**	**–0500**	**–1000**	**–2000**
Cap., ml	25	50	125	250	500	1000	2000
Stopper No.	0	1	3	6	7	9	10
No. in pkg.	12	12	12	6	4	2	2
No. in case	36	36	24	12	12	6	6
Price, per pkg.	13.68	13.68	16.80	12.48	12.36	9.16	12.66
Price, per case	36.94	36.94	30.24	22.46	33.37	24.73	34.18

NALGENE ERLENMEYER FLASKS Ⓐ 🅃

polycarbonate

• Graduated flasks feature excellent clarity, physical toughness and great strength. Autoclavable. Especially useful in clinical work. 500 ml size is a superior combustion flask for microdetermination of fluorine. Molded-in graduations. Nalgene Hollow Stoppers may be used.

Cat. No. 4103	**–0025**	**–0050**	**–0125**	**–0250**	**–0500**	**–1000**
Cap., ml	25	50	125	250	500	1000
Stopper No.	0	1	5	6	7	9
No. in pkg.	12	12	12	6	4	2
No. in case	36	36	24	12	12	6
Price, per pkg.	21.60	23.64	29.16	19.98	19.80	14.24
Price, per case	58.32	63.83	52.49	35.96	53.46	38.45

NALGENE ERLENMEYER FLASKS WITH SCREW CLOSURES Ⓐ 🅃

polycarbonate; polypropylene screw closures

• The toughness and transparency of polycarbonate are combined with the utility of screw closures in these graduated flasks. For the preparation and storage of culture media and for many culturing techniques. Closures are linerless, noncontaminating, and can be autoclaved. Mouth can be flamed gently if desired.

Cat. No. 4108	**–0025**	**–0050**	**–0125**	**–0250**	**–0500**	**–1000**
Cap., ml	25	50	125	250	500	1000
Closure size, mm	20	24	33	38	43	53
No. in pkg.	6	6	6	4	4	2
No. in case	24	24	24	12	12	6
Price, per pkg.	14.22	15.18	18.12	15.96	22.80	15.80
Price, per case	51.19	54.65	65.23	43.09	61.56	42.66

NALGENE DEWAR FLASKS

linear polyethylene; expanded polystyrene cover; polyethylene coated handle

• The first all-plastic Dewar flasks suitable for cryogenic work. They are *shatterproof:* use them with complete safety with liquid nitrogen as well as for dry ice-solvent and hot baths. The double walls are molded from chemically-resistant linear polyethylene, which will withstand temperatures from –196°C to + 100°C. The annulus is filled with insulating urethane foam. Ribs molded in for safer handling except on 10 liter size. Vented, insulating cover. Convenient bail-type handle except on 10 liter size. Packed 1 per carton.

Cat. No. 4150	**–1000**	**–2000**	**–4000**	**–9000***
Cap., liters	1	2	4	10
I.D. at mouth, in.	3¾	4¾	5¾	7¾
Inside depth, in.	7⅝	8⅞	11 5/16	15½
Overall ht., in.	9	10¼	12¾	18
No. in case	4	2	2	1
Price, each	23.50	29.36	35.22	65.00
Price, per case	84.60	52.85	63.40	65.00

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NALGENE DESICCATORS

NALGENE VACUUM DESICCATOR, 250 mm Ⓐ 🅃

polycarbonate cover; green polypropylene body and stopcock with Teflon plug

• Both the transparent polycarbonate cover and the polypropylene base are implosion-proof at full vacuum. The body is impervious to acids, alkalies, and all usual desiccants. Convenient vacuum connection on body makes cover easier to handle. Stopcock breaks vacuum gently, leaving ash undisturbed. Supplied with a quick disconnect adapter for ¼" vacuum tubing. Recessed-rim design on cover keeps grease off bench top when cover is set down. Also useful as a lyophilizing chamber for freeze-drying small samples in tubes or vials. Overall height 9⅝"; outside diameter including stopcock, 12 15/16". Maximum clearance above plate, 145 mm. Takes any standard 230 mm desiccator plate (see below). Individually packaged. Available without stopcock—Cat. No. 5309-0250.

Cat. No. 5310-0250		**Cat. No. 5309-0250**	
No. in case	4	No. in case	4
Price, each	44.84	Price, each	30.28
Price, per case	161.42	Price, per case	109.01

NALGENE DESICCATOR PLATES Ⓐ

light green Nucerite®

• ***Guaranteed* unbreakable*** desiccator plates, with greater thermal shock resistance than porcelain. Made of Nucerite, a ceramic-metal composite, these plates feature fire-polished, corrosion-resistant, inert, non-stick glass surfaces. The plates are marked with numbered quadrants for easy location of crucibles and other containers . . . allow use by several people. Six holes in each quadrant and a ⅞" center hole. Individually packaged.

*If your Nalgene Desiccator Plate should, within five years from date of purchase, become unusable because of thermal shock, corrosion, or breakage (excluding chipping caused by abuse) when employed in a laboratory desiccator, it will be replaced at no charge if returned to Nalge Company, Rochester, New York 14602.

Cat. No. 5312	**-0140**	**-0190**	**-0230**
O.D., mm	140	190	230
Price, each	6.30	10.08	12.40
Price, per case of 6	34.02	54.43	66.96

NALGENE VACUUM PUMPS AND ACCESSORIES

NALGENE HAND-OPERATED VACUUM PUMP WITH VACUUM GAUGE

polyvinyl chloride pump

• With a few squeezes of the handle this pump attains and holds a vacuum of 25 in. Hg. Equipped with gauge to monitor vacuum in both centimeters and inches of mercury. Pumping rate is 15cc per stroke. Fitted with valve to release vacuum without disconnecting pump from line. Entire unit weighs less than ½ pound and is sealed, self-lubricating and corrosion-resistant. Gives 7 p.s.i. positive pressure at outlet port. Nozzle fits standard ¼" I.D. tubing. Supplied with 2-foot length of ¼" I.D. Nalgon® vinyl tubing.

Cat. No. 6130	**-0010**
No. in pkg.	1
No. in case	4
Price, each	22.50
Price, per case	81.00

NALGENE FLUID TRANSFER CLOSURE Ⓐ

polypropylene

• Use these 70 mm closures with Nalgene Mason Jars (500 and 1000 ml sizes) and Nalgene Straight Side Wide Mouth Jars (125 and 250 ml sizes) for fluid transfer in either direction in lab or field . . . siphoning, evacuation, bleeding fluid lines, collecting samples, transferring reagents. Two vent tubes, molded into top of closure, connect to external fluid source and to vacuum/pressure pump with ¼" I.D. flexible tubing (Nalgon flexible PVC tubing is suitable). With closure connected to pump's vacuum inlet (Nalgene Hand-Operated Vacuum Pump is suitable), fluid is drawn into transfer jar. To force fluid out of jar, connect closure to pump's pressure outlet (for such positive transfer, insert ⅛" O.D. stiff tubing into bottom opening in closure . . . Nalgene polypropylene tubing is suitable). Autoclavable.

Cat. No. 2153	**-0700**
No. in pkg.	6
No. in case	24
Price, per pkg.	4.50
Price, per case	16.20

NOT ASSORTABLE

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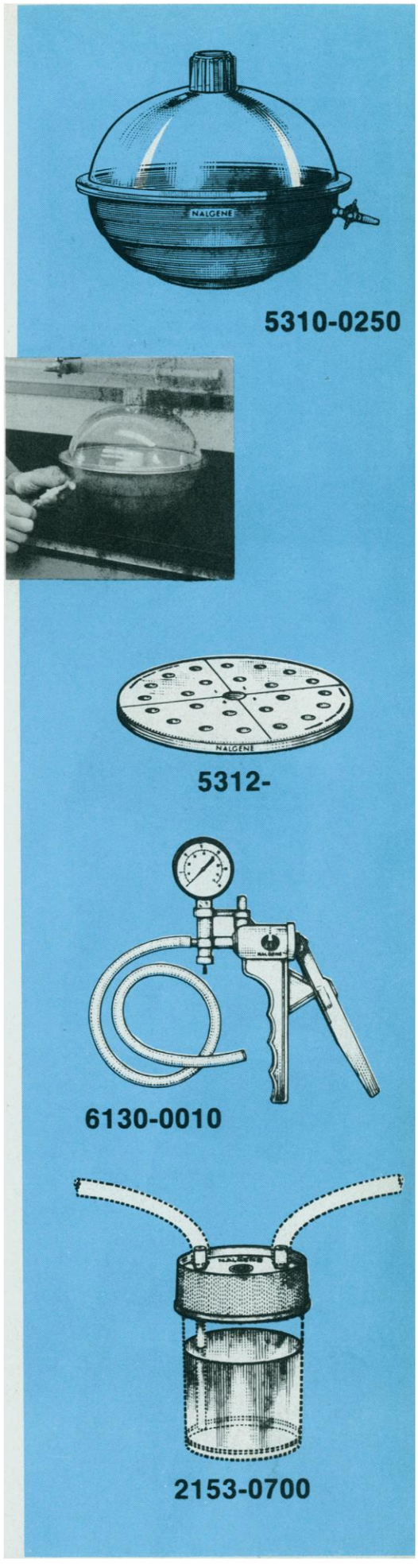


New!..NALGENE® EMERGENCY EYE WASH STATION

Help in a hurry for eye accidents...when seconds count!

OSHAct regulations 1910.151: "Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use."

The new Nalgene Emergency Eye Wash Station, with its compact size and low price, now makes it possible to have eye-washing units wherever eye accidents can occur. In the first few critical seconds after an eye accident, a Nalgene Eye Wash Station close at hand can be a priceless addition to your facilities.

Look over its many features and then consider it not only for the laboratory but for warehouse and chemical storerooms, for shipping areas, and wherever any substance harmful to the eyes is being handled.

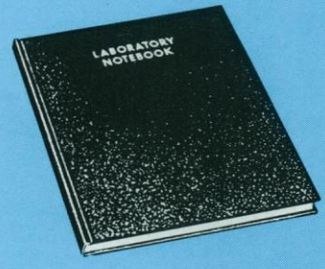
U.S. Pat. No. 3,871,554

Cat. No. 6340-1000

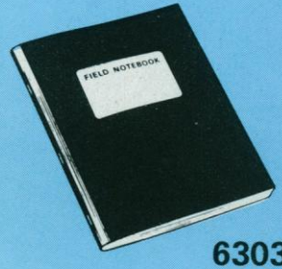
Capacity: 2.5 liters (approx. .7 gal.)
Weight: 4.951 kg (10 lbs. 14 oz.) filled; 1.8 kg (4 lbs.) empty
Dimensions: Ht., 14″; Diameter (body), 7.5″; Width (cover & handles), 11¼″

Price, each . . . . . $ 70.00
Price for case of 4 . . . . . $252.00

NOT ASSORTABLE



6300-1000



6303-1000

6306-0500

NALGENE NOTEBOOKS

NALGENE LABORATORY NOTEBOOK

PolyPaper® polyethylene pages; black polyethylene cover

• Your valuable notes and data are safe in this hard-cover, case-bound notebook. Pages are chemical and tear-resistant 100% spunbonded polyethylene, and measure 9¼″ x 11¼″. Neither floods nor chemical spills will affect the archival quality of this plastic "paper." Pages may be written on with ball-point pen but for the ultimate in chemical resistance and in writing, use the Nalgene Lab Pen with this notebook. Contains 108 pages: 100 numbered and printed with a fine, green grid (4 lines per inch); instructions for keeping a notebook; index; one page for issuing the book, and three blank pages. The permanently-bound, tear-resistant pages with spaces for dates and signature of worker and witness provide patent protection.

Cat. No. 6300	**–1000**
Price, each	9.30
Price, per case of 6	50.22

NALGENE FIELD NOTEBOOK

PolyPaper® polyethylene pages; polyethylene cover

• At last, a notebook that can survive in the field. Endures salt water, mud, chemicals, all kinds of dirt. The treated polyethylene pages are washable and they dry flat; have excellent resistance to chemicals and accept virtually all writing devices, including ball-point pen and Nalgene Lab Pen. Can be written upon when wet, even under water with No. 2 pencil. The book has 48 leaves measuring 9¼″ x 11¼″. The pages are printed on both sides with a fine green grid (4 squares per inch) and are numbered 1 through 96. The book is bound with rust-proof staples and the black polyethylene cover makes it completely waterproof.

Cat. No. 6303	**–1000**
Price, each	9.30
Price, per case of 6	50.22

NALGENE POCKET DATA BOOK

PolyPaper® polyethylene pages; polyethylene cover

• Here is the most durable pocket notebook ever produced. The 4½″ x 8″ dimensions fit most pockets. White plastic binding won't rust. Heavy-gauge green polyethylene covers provide firm writing surface. 32 PolyPaper note sheets are ruled (3 lines per inch) on both sides. They are lint-free, washable, accept all writing devices (including Nalgene Lab Pen) and take No. 2 pencil writing when wet, even under water. The Nalgene Pocket Data Book has excellent resistance to chemicals. It is completely waterproof; it even floats.

Cat. No. 6306	**–0500**
Price, per pkg. of 4	15.20
Price, per case of 12	41.04

Send for the 1977 Nalgene® Labware Catalog. Circle R.S. No. 139

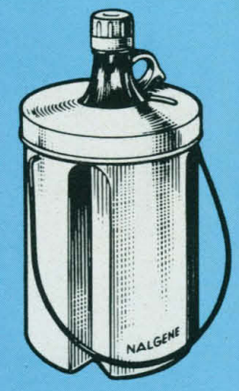
NALGENE SAFETY PRODUCTS

NALGENE SAFETY BOTTLE CARRIERS

conventional polyethylene; polyethylene coated handle

• Carriers hold 5 pt. acid bottles and standard 1 gal. chemical bottles firmly in place, and provide cushion to prevent breakage. Snap cover secures bottle in carrier. Accommodates bottles with finger loops.

Cat. No. 6501	**–0005**	**–0010**
Size	5 pt.	1 gal.
Price, each	20.40	23.18
Price, per case of 6	110.16	125.17



NALGENE SAFETY PINT BOTTLE CARRIER

linear polyethylene; polyethylene coated steel handles

• Now safety-conscious labs can have Nalgene safety carriers for one-pint as well as larger glass reagent bottles! Exclusive design keeps six bottles snugly in place top and bottom without touching. Cover snaps on securely. Handle snaps into position for stability in carrying. Easy to clean.

Cat. No. 6505	**–0010**
Size, L x W x H, in.	13 x 9 x 8
Price,each	20.00
Price, per case of 6	108.00

6505-0010

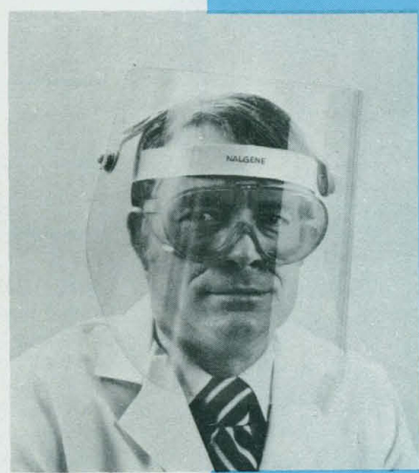
NALGENE FACE SHIELD T

polycarbonate shield; polyethylene headdress

• Specifically designed to meet laboratory standards, the Nalgene face shield has an optically clear window of .060" polycarbonate which offers even greater impact protection than other face shields currently available. Designed to fit comfortably for long periods of time. Adjustable headdress. The wraparound design provides protection to the front and sides. The full height offers protection for the neck and top of the head. Can be worn comfortably over safety goggles.

Cat. No. 6355	**–0001**
Price, each	18.20
Price, per case of 4	65.52

NOT ASSORTABLE



6355-0001

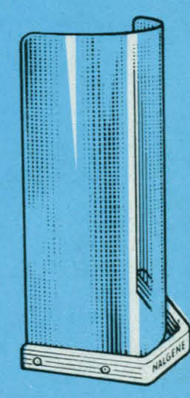
NALGENE SAFETY SHIELDS T

polycarbonate; steel base

• Made of 3/16" polycarbonate, which has far greater impact resistance than any other transparent laboratory shield material. Heavy ¾"-thick coated steel base projects from center section of shield for extra stability, also serves as a lower handgrip. Perpendicular design allows maximum protection along full height of shield. Formed in parabolic curve for good containment of fragments and protection of personnel to the sides. (Even greater impact resistance can be achieved through use of Nalgene Safety Shield Liners and Safety Shield Weights—see item descriptions.)

Cat. No. 6350	**–1524**	**–3024**	**–3636**
Ht. x Width (at rear), in.	15 x 16	30 x 16	36 x 24
Price, each, in any quantity	69.56	98.44	133.76

NOT ASSORTABLE



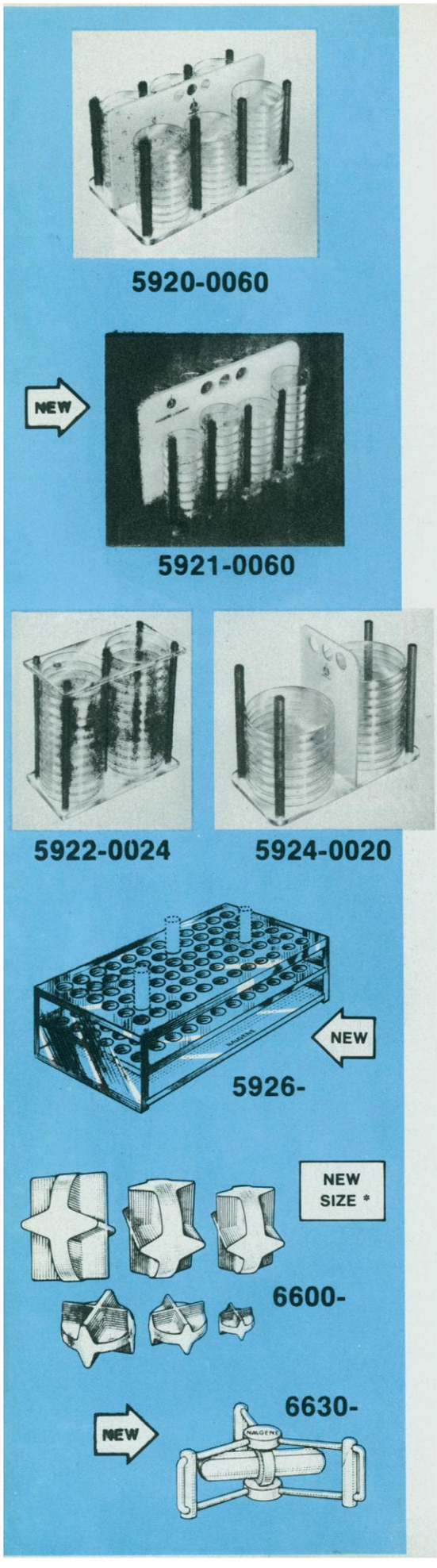
NALGENE CLEAN SHEETS™ BENCH, SHELF & DRAWER LINER

white cross-linked polyethylene foam

• Same material as Work Surface (above) but 1/8" thick. Comes in 50 foot rolls of 12", 18" or 30" widths; fits standard bench tops (30"), drawers (18") and shelves (12"). Use it to line sinks, drawers, benches, shelves—anywhere protection is needed against chemicals, vibration, heat, dirt, breakage. Can be cut to any size and stapled, tacked or taped.

Cat. No. 6283	**–1250**	**–1850**	**–3050**
Width, in.	12	18	30
Price, per roll	33.18	46.80	78.02
Price, per case of 2	59.72	84.24	140.44

Send for the 1977 Nalgene® Labware Catalog. Circle R.S. No. 140



NALGENE LAB AIDS

NALGENE PETRI DISH RACKS

acrylic

• Attractive yet practical—the new Nalgene petri dish racks provide full side visibility so that culture can be checked during incubation. They are lightweight, easier to load and provide safer transport. Wide range of uses includes media preparation, inoculation, incubation and storage. The No. 5920 holds up to sixty 100 mm dishes, No. 5921 up to fifty-six 60 mm dishes, No. 5922 up to two dozen 100 mm dishes and the No. 5924 holds up to twenty 150 mm dishes. Individually packaged.

Cat. No.	**5920-0060**	**5921-0060***	**5922-0024**	**5924-0020**
Dim., in. (L x H x W)	13 x 8 x 7¾	9⅝ x 7¼ x 5⅜	8 x 8 x 4	12¼ x 9¾ x 6
No. in case	2	2	4	2
Price, each	39.00	39.00	16.00	29.00
Price, per case	70.20	70.20	57.60	52.20

NOT ASSORTABLE

NALGENE TEST TUBE RACK Ⓣ

acrylic

• ***New.*** Attractive, heavy-duty acrylic test tube rack. Since it is transparent, it offers full visibility of test tubes and contents. Designed to hold test tubes securely during a test phase or during transportation. Two sizes—one for 10 mm to 13 mm test tubes and one for 14 mm to 16 mm test tubes. Easy to clean.

Cat. No. 5926	**–0013**	**–0016**
Cap., tubes	72	72
Tube size, mm	10 to 13	14 to 16
Size, L x W x H, in.	9½ x 5 x 2¾	11¼ x 6 x 3
Price, each	35.00	35.00
Price, per case of 2	63.00	63.00

NOT ASSORTABLE

NALGENE STIRRING EQUIPMENT

NALGENE STAR HEAD™ MAGNETIC STIR BARS† Ⓐ

Alnico V magnet encapsulated in Teflon TFE

• A new stirring concept for better mixing with fins top and bottom. Compared with other stir bars: Star Head stir bars provide greater mixing—vigorous stirring action at the bottom, sides and top of the container; no chattering or splashing. They save time—things get mixed faster. Use them in round-bottom labware; no need for special-shape stir bars. Have outstanding chemical resistance and high-temperature stirring action (to 260°C).

Cat. No. 6600	**–0010**	**–0014***	**–0017**	**–0022**	**–0030***	**–0035**	**–0040**	**–0058**
Dia. x ht.: mm	10 x 8	14 x 10	17 x 13	22 x 15	30 x 12	35 x 12	40 x 14	58 x 15
in.	⅜ x 5/16	9/16 x ⅜	11/16 x 9/16	⅞ x ⅝	13/16 x ½	1⅜ x ½	1 9/16 x 9/16	2¼ x 1 1/16
No. in case	10	10	10	10	10	5	5	5
Price, each	2.80	2.80	2.80	3.20	3.70	4.50	5.70	10.20
Price, per case	25.20	25.20	25.20	28.80	33.30	20.25	25.65	45.90

†U.S. Design Patent No. Des. 240,145

NALGENE FLOATING STIR BARS Ⓐ

Teflon stir bar; Alnico V magnet encapsulated in TFE; Tefzel bracket

• ***New.*** Floating stir bar designed for low speed stirring in tissue culture applications. The stir bar is slightly raised off the bottom surface of the vessel to minimize grinding effect on cells. Constant action at extremely low speeds. Less aeration. Easily disassembled for cleaning. Autoclavable. Legs can be compressed to fit through small openings. Size codes correspond to beaker sizes.

Cat. No. 6630	**–0250**	**–0400**	**–1000**	**–2000**	**–4000**
Fits beaker size, ml	250	400	1000	2000	4000
Dim., Dia. x Ht., mm	58.4 x 33	66 x 33	93.9 x 35.5	132 x 35.5	165.1 x 38.1
Fits min. opening, mm	38.1	38.1	38.1	38.1	38.1
No. in case	4	4	2	2	2
Price, each	15.00	19.00	23.20	24.40	33.20
Price, per case	54.00	68.40	41.76	43.92	59.76

Send for the 1977 Nalgene* Labware Catalog. Circle R.S. No. 141

NALGENE HEAVY-DUTY AUTOCLAVABLE CONTAINERS

NALGENE STERILIZING PANS AND ROUND BASIN Ⓐ

natural polypropylene

• For drying/sterilizing instruments, labware, other materials at temperatures to 121°C. Use basin for ice baths; use large size pan for collecting/washing soiled lab equipment. Rolled edges for extra stiffness and strength. Pans tapered for nesting.

Cat. No.	**6900 -0010**	**-0020**	**6901 -0040**
Cap., qts.	10	15	4
Dim., in.	12½ x 10 x 5¼	21¾ x 16¾ x 5¼	10½ (top I.D.) x 3½ deep
No. in case	6	6	12
Price, each	7.44	13.00	3.74
Price, per case	40.18	70.20	40.39

NALGENE JARS Ⓐ

polypropylene

• In addition to the uses listed for LPE jars above, these polypropylene jars can also be used as autoclavable waste containers. For covers use No. 5308.

Cat. No. 5304	**-0910**	**-1212**
Cap., gal.	2	4½
O.D. x height, in.	8¾ x 10	12 x 12
Price, each	8.50	12.50
Price, per case of 4	30.60	45.00

NALGENE COVERS Ⓐ

polypropylene

• Use with polypropylene jars above. Autoclavable.

Cat. No. 5308	**-0009**	**-0012**
I.D., in.	8¾	12
Price, each	3.76	5.00
Price, per case of 6	20.30	27.00

NALGENE BUCKET WITH GRADUATIONS

white linear polyethylene; polyethylene-covered bail

• More durable replacement for hard rubber bucket. Handle and wide-lipped pour spout for the toughest service requirements. Graduated in pints and liters. Capacity, 2½ gallons. Autoclavable with caution.

Cat. No. 7002	**-0025**
No. in case	6
Price, each	15.00
Price, per case	81.00

NALGENE BUCKET Ⓐ

white polypropylene; stainless steel bail with polypropylene handle

• An autoclavable bucket for food industries, handling photographic chemicals and corrosive liquids and other uses. Does the work of stainless steel buckets at far less cost. Capacity 11 quarts.

Cat. No. 7012	**-0110**
No. in case	6
Price, each	9.50
Price, per case	51.30

NALGENE UTILITY WARE

All Utility Ware products are NON-ASSORTABLE. Case prices reflect 10% discount.

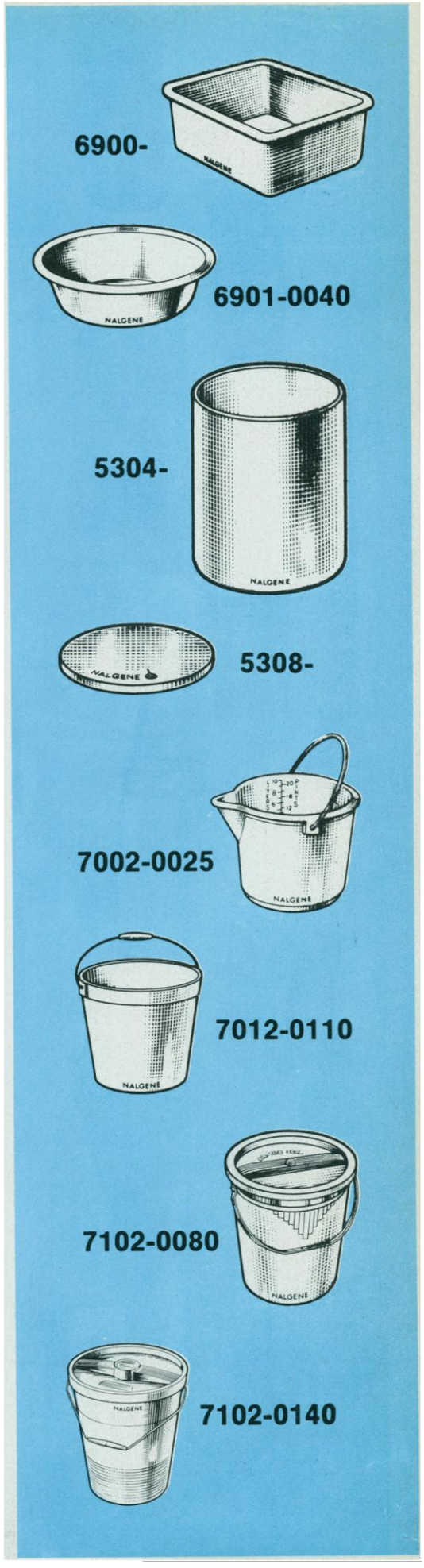
NALGENE AIR-TIGHT PAILS

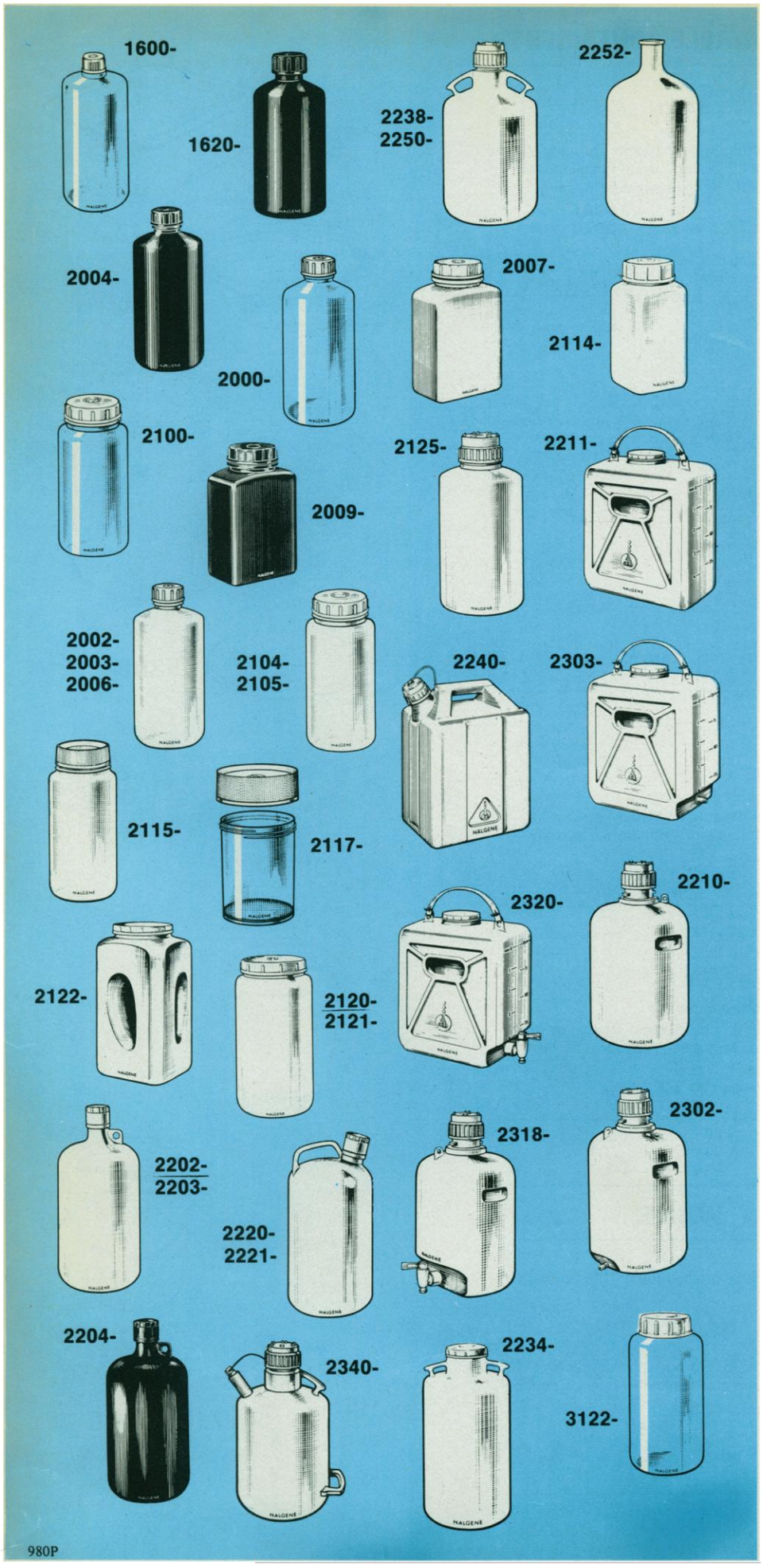
polyethylene

• Close fitting, air-tight covers make these pails ideal for storage of anatomical specimens in formalin and other preservatives. 14-quart size, yellow with white cover. Sturdy handles. 8-quart size, in white.

Cat. No. 7102	**-0080**	**-0140**
Cap., qt.	8	14
Height, in.	10	12¾
No. in case	12	6
Price, each	4.48	7.10
Price, per case	48.38	38.34

Send for the 1977 Nalgene® Labware Catalog. Circle R.S. No. 142





Bottles, Bottles, Bottles...

Nalgene® bottles and carboys are available in a wide range of styles, materials, and sizes to meet your needs. The different styles include wide mouth and narrow mouth bottles, round or rectangular shapes, and handles, spigots or tubulation. They are available in seven different materials. Sizes range from 30 ml (1 oz.) to 50 liters (13 gal.).

•

The complete listing of Nalgene bottles and carboys is available in the new 1977 Nalgene Labware Catalog. You can obtain your copy by writing or calling:
Nalgene Labware Department,
Nalge Company, Box 365,
Rochester, N.Y. 14602.
Telephone: (716) 586-8800.

SYBRON | Nalge

2nd Annual AAAS Colloquium on

R&D in the Federal Budget

15-16 June

Sheraton National Motor Hotel
Columbia Pike & Washington Blvd.
Arlington, Virginia

Based on the forthcoming report "R&D in the Federal Budget: FY 1978" (copies will be provided to registrants).

The colloquium will provide a forum for constructive discussion of selected topics in the report, including future trends in R&D budgeting, the congressional role in R&D budgeting, and problems in rationales and criteria for R&D budget decisions.

Featured speakers and panelists will include appropriate officials from the Executive Branch, Members of Congress, and leading figures in the scientific, technical, and public policy communities.

PRELIMINARY AGENDA

Wednesday, 15 June

10:00 a.m. Opening session; opening address.

12:30 p.m. Lunch; major address.

2:30 p.m. *R&D Budgets and Future Outlook.* This session will consider current budgets and future outlook for R&D. Selected speakers, panelists, and participants will address major issues in the FY 1978 budget; the trends and 5-year outlooks for federal R&D; and their implications for national needs, scientific progress, and R&D institutions.

5:30 p.m. Reception and buffet dinner; major address.

7:30 p.m. *Congressional Role in R&D Budgeting.* This session will address questions of current interest regarding the role of Congress, its committees, and associated agencies in R&D budgeting. Discussion will focus on the congressional vs. the executive role; the proper balance and degree of control over R&D programs; problems and limitations; and effective interaction between scientific and technical communities and the Congress.

Thursday, 16 June

10:00 a.m. *How Should R&D Decisions Be Made?* This session will attempt to develop a consensus among representatives of the scientific and technical community, the Executive Branch, and the Congress on how R&D budget decisions should be made. Issues to be addressed will include conditions to be met and avoided, a "straw man" conceptual system of processes, criteria for R&D budget decisions, and unresolved questions that require attention.

1:00 p.m. Lunch; major address; closing of program.

Colloquium Registration Form*

- ☐ $40 Single Registration (includes FY78 report and Proceedings of Colloquium)
- ☐ $7 Lunch on Wednesday, 15 June
- ☐ $11 Buffet Dinner on Wednesday, 15 June
- ☐ $7 Lunch on Thursday, 16 June
- ☐ $15 Single Student Registration (full-time graduate or undergraduate; does *not* include report or proceedings)
- ☐ $10 Copy of previous report (FY77) *and* Proceedings of first Colloquium (1976)

*Check appropriate boxes and return this form with separate check for above amount. Make check payable to AAAS.

Hotel Reservation Form

Sheraton National Motor Hotel

☐ Single Room $33 ☐ Double Room $41*

Name _____

Address _____

_____

City _____

State _____ Zip_____

*Room to be shared with _____

_____

Please indicate any special requirements due to handicap:

_____

_____

Arrival: June____; a.m. _____p.m. _____

Departure: June____; a.m. ____p.m. ____

NOTE: Reservations must be received not later than 3 weeks prior to arrival date. Rooms will not be held after 6 p.m. on date of arrival unless reservation is accompanied by a 1-day deposit (make separate check payable to Sheraton National Motor Inn and send to AAAS with your registration; rates will be subject to 9% Virginia tax.). Checkout time is 1 p.m.

GROUND TRANSPORTATION: Sheraton National Motor Hotel provides courtesy limousine service from and to Washington National Airport at half-hourly intervals.

FREE PARKING is available at the Sheraton National Motor Inn for all hotel guests and colloquium attendees.

Return this form with check for Colloquium registration (and separate check if hotel registration must be held) to:

R&D Colloquium
AAAS Meetings Office
1776 Massachusetts Ave., NW
Washington, DC 20036

PRODUCTS and MATERIALS

Spectrophotometer

The DMC 26 is a color-measuring, double-beam spectrophotometer. It measures in reflectance, fluorescence, and transmission modes. It features the option of monochromatic or polychromatic illumination. Various spectral bandwidths and scanning speeds may be selected. The double-grating monochromator has a spectral range from 300 to 900 nanometers. Computer software is available for many color-matching and measuring functions. Carl Zeiss. Circle 681.

Amino Acid Analyzer Programmer

The Chromatograph Programmer will automate any amino acid analyzer or other liquid chromatograph. Ten time intervals may be programmed from 5 seconds to 99 minutes and up to seven external devices may be turned on or off each time interval changes. Optional eluent-selection valve and 15-sample automatic injection valve may also be controlled. Memory content may be read or changed at any time. Durrum Chemical. Circle 682.

Liquid Chromatograph

The HP 1080A contains pump, injector, column, detector, and solvent reservoir in a mainframe that is 34 by 20.5 by 21.5 inches. The heart of the system is a single-head diaphragm pump whose stroke can be adjusted by a push-button-controlled stepping motor to set the solvent flow. Pump-stroke position and column pressure are indicated on a numeric display. The injector permits sample insertion with no interruption of flow; a 20-microliter loop is standard. A variety of columns is available. The ultraviolet detector operates at 254 nanometers. The instrument may be linked to data-processing devices. Hewlett-Packard. Circle 686.

Gas Chromatograph–Mass Spectrometer

SIMULSCAN simultaneously offers the sensitivity and simplified molecular ion spectra of chemical ionization and the structural information of electron impact ionization from the same sample. The two spectra may be obtained at rates of 2 milliseconds per atomic mass unit (less than 0.25 second for a typical scan of 100 atomic mass units). The standard unit includes positive ion mass spectrometry and analog detection and operates to mass 1000. Extranuclear Laboratories. Circle 687.

Blood Withdrawal System

A nonthrombogenic, microflow blood withdrawal system is available as a mobile, pocket-sized, battery-operated unit. Blood may be withdrawn from an ambulatory patient at flow rates down to 1.20 milliliters per hour. The device provides samples to yield representative data relative to changes in blood chemistry without periodic manual sampling. The catheter and tubing set will not induce thrombosis even at these low flow rates. The device operates up to 24 hours between charges. Cormed. Circle 688.

Ultraviolet Radiometer

The J-260 reads from 1 microwatt per square centimeter to 199.9 milliwatts per square centimeter with accuracy and precision traceable to NBS standards. The unit is available with cosine-corrected sensors for measuring at 254, 297, or 365 nanometers. All are calibrated and easily interchangeable. The J-260 uses rechargeable nickel-cadmium batteries. The device is field-portable for a wide variety of research applications. Ultraviolet Products. Circle 684.

Environmental Chamber

The LC34 features a patented air curtain that maintains a constant controlled low temperature within the chamber without the use of doors. This provides easy access to the contents of the chamber and an unobstructed view of the interior as well. The LC34 contains 40 cubic feet of storage space and requires 12 square feet of floor space. Sherer Environmental Chambers. Circle 683.

Sequential Numberer

The Number Wand reduces experiment-processing time and ambiguity of sample sequences. It automatically prints sequential numbers directly on scintillation vial caps, sample and storage vial caps, petri dishes, slides, bottles, and filters. It numbers containers individually or in trays. A variety of quick-drying colored inks and adaptors permits a wide range of uses. Rapid Number. Circle 685.

Literature

Air Sampling and Analysis describes a line of filtration products important to environmental testing. Gelman Instrument. Circle 690.

New Product Bulletin features laboratory apparatus and glassware for chromatography, vacuum research, and other analytic techniques. Kontes. Circle 691.

Electronic Balances is devoted to digital manual and semiautomatic models. Torsion Balance. Circle 692.

Water Analysis Products for Education offers test kits and apparatus for the study of aquatic ecology. Hach Chemical. Circle 693.

Laboratory Chemicals lists more than 8000 frequently used reagents, solvents, stains, plasticizers, organics, and inorganics. Chem Service. Circle 694.

Focus on Science is a quarterly publication that emphasizes laser techniques and instruments. Coherent Radiation. Circle 695.

Oceanographic and Limnologic Equipment provides specifications of apparatus and detailed reference appendices. InterOcean Systems. Circle 696.

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Readers' Service Card (on pages 936A and 1024G) and placing it in the mailbox. Postage is free.

—RICHARD G. SOMMER

BOOKS RECEIVED AND

BOOK ORDER SERVICE

(Continued from page 974)

erick J. de Serres, James R. Fouts, John R. Bend, and Richard M. Philpot, Eds. North-Holland, Amsterdam, 1976 (U.S. distributor, Elsevier, New York). viii, 364 pp., illus. $29.95.

Keypunching. Peggy Hanson. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1977. xiv, 206 pp., illus. Paper, $8.50.

Lecture Notes on Introductory Theoretical Astrophysics. R. J. Weymann and five others. Pachart Publishing House, Tucson, Ariz., 1976. x, 230 pp., illus. $14.95.

Legal Issues in Pediatrics and Adolescent Medicine. Angela Roddey Holder. Wiley, New York, 1977. xvi, 350 pp. $18.50. A Wiley Medical Publication. *To order this book circle No. 411 on Readers' Service Card*

Liberal America and the Third World. Political Development Ideas in Foreign Aid and Social Science. Robert A. Packenham. Princeton University Press, Princeton, N.J., 1976. xxii, 396 pp. Paper, $4.95. Reprint of the 1973 edition.

Mammalian Cell Membranes. Vol. 3, Surface Membranes of Specific Cell Types. G. A. Jamieson and D. M. Robinson, Eds. Butterworths, Boston, 1977. x, 276 pp., illus. $37.50.

The Mathematical Papers of Isaac Newton. Vol. 7, 1691–1695. D. T. Whiteside, Ed. Cambridge University Press, New York, 1976. xlviii, 706 pp., illus. $95.

The Meaning of Fossils. Episodes in the History of Paleontology. Martin J. S. Rudwick. Science History Publications (Neale Watson), New York, ed. 2, 1977. xvi, 288 pp., illus. Cloth, $15; paper, $6.95. History of Science Library.

Metal Cutting. E. M. Trent. Butterworths, Boston, 1977. xii, 204 pp., illus. $19.95.

Metal Forming. Tool Profiles and Flow. T. Z. Blazynski. Halsted (Wiley), New York, 1977. xii, 380 pp., illus. $40. *To order this book circle No. 412 on Readers' Service Card*

Méthodes en Théorie des Champs. Methods in Field Theory. Papers from a summer school, 1975. Roger Balian and Jean Zinn-Justin, Eds. North-Holland, Amsterdam, 1976 (U.S. distributor, Elsevier, New York). xx, 386 pp. $39.95. Les Houches Session 28.

Microcirculation. Vol. 1, Blood-Vessel Interactions, Systems in Special Tissues. Proceedings of a congress, Toronto, June 1975. John Grayson and Walter Zingg, Eds. Plenum, New York, 1976. xxiv, 420 pp., illus. $32.

The Modern Rise of Population. Thomas McKeown. Academic Press, New York, 1976. vi, 168 pp., illus. $14.50.

Multicriteria Decision Making and Differential Games. George Leitmann, Ed. Plenum, New York, 1976. xvi, 462 pp. $35. Mathematical Concepts and Methods in Science and Engineering.

Neural Principles in Vision. Papers from a symposium, Munich, Sept. 1975. F. Zettler and R. Weiler, Eds. Springer-Verlag, New York, 1976. x, 432 pp., illus. $39.40. Proceedings in the Life Sciences. *To order this book circle No. 413 on Readers' Service Card*

Noise Control in Mechanical Services. R. I. Woods, Ed. Sound Attenuators Limited and Sound Research Laboratories Limited, Colchester, Essex, England, 1977 (U.S. distributor, Halsted [Wiley], New York). xiv, 406 pp., illus. $22.50. *To order this book circle No. 414 on Readers' Service Card*

Nuclear Power. Walter C. Patterson. Penguin Books, New York, 1976. 304 pp. Paper, $3.50. A Pelican Original.

Nutrition and the Climatic Environment. William Haresign, Henry Swan, and Dyfed Lewis. Butterworths, Boston, 1977. viii, 200 pp., illus. $17.95. Studies in the Agricultural and Food Sciences.

The Organic Chemistry of Drug Synthesis. Daniel Lednicer and Lester A. Mitscher with a glossary by Philip F. vonVoigtlander. Wiley-Interscience, New York, 1977. xviii, 472 pp., illus. $22.50. *To order this book circle No. 415 on Readers' Service Card*

The Organization of Nematodes. N. A. Croll, Ed. Academic Press, New York, 1976. viii, 440 pp., illus. $32.75.

Die Orthopteren Europas. Band 3. The Orthoptera of Europe. Vol. 3. Kurt Harz and Alfred Kaltenbach. Junk, The Hague, 1976. 434 pp., illus. Dfl. 140. Series Entomologica, vol. 12.

Physical Structure of the Amorphous State. Papers from a symposium, Atlantic City, N.J., Sept. 1974. G. Allen and S. E. B. Petrie, Eds. Dekker, New York, 1977. vi, 304 pp., illus. Paper, $32.50. Reprinted from the *Journal of Macromolecular Science—Physics*, vol. B12 (1 and 2).

Plane Trigonometry. Fred W. Sparks, Paul K. Rees, and Charles Sparks Rees. Prentice-Hall, Englewood Cliffs, N.J., ed. 7, 1977. xiv, 316 pp., illus. $10.95.

Politics in Hungary. Peter A. Toma and Ivan Volgyes. Freeman, San Francisco, 1977. xii, 188 pp. $12.

Population. Analysis and Models. Louis Henry. Translated from the French edition (Paris, 1972) by Etienne van de Walle and Elise F. Jones. Academic Press, New York, 1977. xiv, 302 pp., illus. $19.50.

Principles of Pyrometallurgy. C. B. Alcock. Academic Press, New York, 1976. xiv, 348 pp., illus. $19.25.

Principles of Ultraviolet Photoelectron Spectroscopy. J. Wayne Rabalais. Wiley-Interscience, New York, 1977. xviii, 454 pp., illus. $29.95. Wiley-Interscience Monographs in Chemical Physics. *To order this book circle No. 416 on Readers' Service Card*

Progress in Nucleic Acid Research and Molecular Biology. Vol. 19, mRNA: The Relation of Structure to Function. Papers from a symposium, Gatlinburg, Tenn., Apr. 1976. Waldo E. Cohn and Elliot Volkin, Eds. Academic Press, New York, 1976. xxxiv, 524 pp., illus. $35.

Proofs and Refutations. The Logic of Mathematical Discovery. Imre Lakatos. John Worrall and Elie Zahar, Eds. Cambridge University Press, New York, 1976. xii, 174 pp., illus. Cloth, $19.50; paper, $4.95.

Psycho-pédagogie de la Lucidité. J. M. Paisse. Dessart et Mardaga, Brussels, Belgium, 1976. 200 pp. Paper, 390 BF.

Quark Confinement and Field Theory. Proceedings of a conference, Rochester, N.Y., June 1976. D. R. Stump and D. H. Weingarten, Eds. Wiley-Interscience, New York, 1977. x, 254 pp., illus. $24.95. *To order this book circle No. 417 on Readers' Service Card*

Quaternary Stratigraphy of North America. Papers from a symposium, Toronto, Canada, 1975. W. C. Mahaney, Ed. Dowden, Hutchinson and Ross, Stroudsburg, Pa., 1976 (distributor, Halsted [Wiley], New York). xvi, 512 pp., illus. $27.50.