

15¢

\$5.50 A YEAR

July 12, 1958

VOL. 74 NO. 2

PAGES 17-32

SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Antarctic Depths

See Page 27

A SCIENCE SERVICE PUBLICATION

Kodak reports on:

sugar in the lacquer, but first esterified . . . how to get started right, or even wrong . . . a run of luck in the optical design department

SAIB



SAIB has a viscosity of 100,000 cps at 86°F. Add 10% ethyl alcohol, making SAIB-90, and the viscosity drops to 700 cps. Any of the commercial lacquer solvents thins it similarly.

SAIB's heat stability is high, its volatility is low (BP > 550°F). This translates into lacquers of much higher non-volatile content at equal application consistencies. The customer has to pay for the solvent, but only the non-volatiles remain behind to cover his surfaces for him.

SAIB is compatible with most resins, plasticizers, oils, and waxes. Half resin—half plasticizer, it can be used to soften or to harden. A coating in which SAIB has replaced nitrocellulose to the extent of 40% is harder than the unmodified nitrocellulose coating. On the other hand, a typical SAIB-modified cloth lacquer showed good flexibility as cold as -6°F. At the hot end, 168 hours at 220°F drove off 1% of SAIB, compared with 17% of the familiar 50% castor oil—50% DOP plasticizer combination in a corresponding formulation containing 10 parts plasticizer.

SAIB stands for sucrose acetate isobutyrate. What a tangled web of modern economics these three deadpan words conceal! Obesity becomes a national worry. The public eats less sugar than the sugar industry would like. Concurrently, industrial alcohol becomes cheaper to synthesize than to ferment from sugar. Along come we, the very people who take oil refinery by-product olefins and make from them Tecsol Ethyl Alcohol as well as n-butylaldehyde for Tenite Bu-

tyrate Plastics and photographic film. It happens we also get quite a bit of isobutylaldehyde to dispose of. So we convert some of it to isobutyric anhydride, make acetic anhydride from some of our ethyl alcohol, and invent a way to esterify sucrose with these anhydrides. Sucrose for the first time becomes something to build upon rather than chop up. It builds into a most durable molecule, studded with solubilizing groups, packing high molecular weight (847) with commercially unparalleled compactness. Thus, SAIB and bright prospects for sugar men, coatings men, householders, and us.

For data on SAIB without the heart throb, write Eastman Chemical Products, Inc., Kingsport, Tenn. (Subsidiary of Eastman Kodak Company).

Special sensitized products

A poor, proud, and gentle old man was once arrested for helping himself out at infrequent intervals over a long period of years by printing a few crude one dollar bills with which to buy food. When his story was made public, it was learned that upon discovering his interest in the graphic arts he had written to us and received basic information on which he had built his modest skill.

By reading our circulars a person can no more acquire proficiency in counterfeiting than he can in autoradiography of tissue sections, spectrography, astrophysical research, or investigations with nuclear track emulsions. Nevertheless, as long as intentions are legal, it doesn't hurt early in the game to obtain from us the essential facts about the specialized photographic materials we manufacture for these purposes.

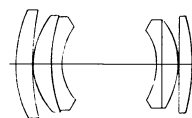
New sheets entitled "Kodak Sensitized Materials for Autoradiography," "Kodak Spectrum Analysis Plates and Films and Kodak 'Spectroscopic' Plates and Films," and "Kodak Nuclear Track Materials" are obtainable without charge from Eastman Kodak Company, Special Sensitized Products Division, Rochester 4, N. Y. He who asks for all three impresses us with the scope of his ambitions but strains our credulity a mite.

Four sharp eyes

After all these years—the recent ones with high-speed digital computers helping—it surprises outsid-

ers that lens designers should still expect to find new combinations of curvatures, refractive indices, thicknesses, and spacings that will substantially improve photographic lens performance. But they do, to the pain of the authors of yesterday's superlatives. A sort of continuous auction goes on, at which optical manufacturers keep bidding up the number of lines per millimeter resolved on film in accordance with Method 7 of MIL-STD-150.

In 6-inch to 12-inch focal lengths for 70mm aerial film at relative apertures around $f/2.8$ to $f/3.5$, we revel for the moment in beating the previous high by nearly twice. We have had a run of good luck in recent months. We did it with our 6-inch $f/2.8$ Kodak Aero Ektar Lens,



Formula M-360. Here are the minimum resolution figures we get at full aperture for a sample lens of this formula photographing high-contrast, 3-line, clear-on-black resolution targets on Kodak Super-XX Aerial Recon Film with white light through a Kodak Wratten No. 12 Filter:

semi-field	0°	2.5°	5°	7.5°	10°	12.5°	15°
lines/mm	56	56	63	62	49	38	33

These figures are very close to what used to be quoted for the capabilities of the film itself. Only nowadays our film people smile at the conceptual *naiveté* of a resolving power figure for film. Only the resolving power of the film-lens combination retains some significance. This significance, too, tends to attenuate after an hour at the blackboard with an earnest man.

There are three other Kodak Aero Ektar Lenses in this class. They are all manufactured on contract, not stocked for off-the-shelf sale. They are not cheap. They are comparatively heavy. Distortion, though moderate, exceeds cartographic limits. Above all else, the driving force behind these lenses is to reduce the need for large size in aerial cameras. Only organizations whose interest is commercial or professional need inquire. They should address themselves to Eastman Kodak Company, Military and Special Products Sales, Rochester 4, N. Y.

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science

Kodak
TRADE-MARK

Special Tool Bargains-Save Up to 50%

One of our BEST Values!
2.9 AMP HEAVY DUTY
1/4" RAM DRILL
 with Jacobs Geared Chuck
 & Key
 Reg. \$39.95—Our Price



\$14.95
 plus 50c pp. & hdlg.

Ask any expert and he'll always say "RAM for Heavy Duty Work." Not just an ordinary 2 1/4 or 2 1/2 amp unit, but a powerful full 2.9 AMP. drill to do every heavy duty job in home, shop or industry. Built to take years of rough-tough use. Newer, more rugged motor gives 1 1/2" capacity in hard wood and 1/4" capacity in steel with a full load speed of 1200 R.P.M. Durable, mirror finished, lightweight aluminum housing. Features Universal, series wound AC-DC motor; heavy duty multiple thrust ball bearings; automatic release trigger switch with locking pin; 6 ft. 2 conductor, UL approved cord and plug. Standard 115 V. AC-DC. This powerhouse measures 9" in length yet weighs only 3 1/2 lbs. If you've ever needed a drill or find that your present 1/4" job just won't do the things you expect of it, ORDER THIS 2.9 AMP. 1/4" RAM DRILL TODAY! Limited quantities.



CHROME PLATED 5 CELL FLASHLIGHT

If you've ever needed a sharp, penetrating light—one that will throw an illuminating beam 1500 feet ahead—then get this TERRA, 5 cell, fixed focus flash! Measures 15" in length with a 3" lens. Highly polished reflector. Instant and steady light switch. Hook at base of completely chrome plated flash permits hanging anywhere.

Well worth \$4.95
 Our Price **\$1.49**
 Less Batteries

plus 21c pp. & hdlg.

Prices Drastically Slashed on Famous SHOP-KING Portable JIG SAW

Snaps on to any 1/4", 5/16" or 3/8" electric drill in seconds. Does work of Jig, Key-hole, Coping, Rip, Crosscut, Band and Hack-saw. Cuts intricate patterns, circles—no matter how large—in plywood, plastics, metal—up to 2 x 4's. Starts inside holes without boring. Self-lubricating bearings. Built-in automatic air blower. Easy to handle because of its right angle drive. Strong safety yoke and worm drive clamp make it vibration proof. Extra large shoeplate assures accurate and square cuts.

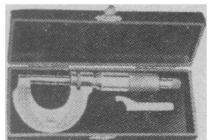


Reg. \$11.95
 Our Price **\$7.95**
 plus 50c pp. & hdlg.

FREE - 4 All Purpose Blades (A \$1.40 Value) ONE YEAR FACTORY GUARANTEE

PRECISION MICROMETERS

At Bargain
Prices!



Chrome plated, adjustable, equipped with ratchet stop and lock nut. Adjustable for zero. Decimal equivalents of fractional sizes die sunk on frame. Recessed frame to allow readings in tight spots. Precision made for accurate readings, fully polished. In velvet lined case.

0-1", 1/1,000" Readings **\$5.95** ppd.
 1-2", 1/1,000" Readings with 1" test gauge **\$7.95** ppd.

Drills and Saws Any Shape! Supreme DRILSAW

Simply insert the amazing Drilsaw into the chuck of your 1/4" electric drill and you're ready to cut any shape you desire. Lower portion of Drilsaw acts as regular 1/4" drill which easily bores thru wood, plaster, plastics, plywood and similar materials. Then, after penetration, the keen cutting edges of the Drilsaw, cleanly and speedily cut in any direction you move. Cut circles, triangles, zig-zags, any conceivable shape you wish—in seconds!

\$1.00 ppd.



**13-Pc. Set
Chrome Vanadium
DRILLS
in Metal Drill Index**
only **\$2.25**

Perfect for Speed Drilling ppd.

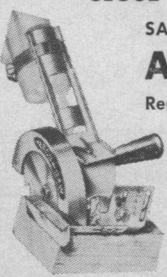
Just imported from West Germany, these 13 precision Chrome Vanadium Drills, from 1/16" thru 1/4" by 64ths are set in a two-sleeve steel, indexed container for easy and instant selection. Full jobber length shanks. Easily and cleanly bite through toughest steels, woods, plastics, iron and aluminum. Unconditionally guaranteed for thousands of drillings.

CLOSE-OUT SPECIAL!

SAVE \$4.55 on Famous

ARCO-SAW

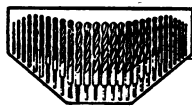
Reg. \$12.50 OUR PRICE



with Precision Graduated Depth-Bevel Rip Gages and 5" Arco Safecut Blade.
\$7.95
 plus 50c pp. & hdlg.

Easily attached in less than a minute to any 1/4" electric drill, this sensational gear-driven saw attachment will go thru 2x4's in one cut—8 times faster than a handsaw. The 5" Sawblade will smoothly and rapidly whiz thru lumber, plywood, wallboard, etc. Comes with precision graduated DEPTH & LEVEL GAUGES for cuts to 1 3/4", levels from 0 to 45 degrees; ADJUSTABLE RIP GAUGE; ADJUSTABLE VISUAL GUIDE; sturdy, easily adjusted SAFETY YOKE; WORM DRIVE CLAMP; RIGHT ANGLE GEAR DRIVE; ONE-PIECE GEAR BOX with steel gears and self-lubricating LIFETIME BEARINGS! Arco-Saw uses 30% less power; blade easily removed and resharpened with ordinary hand file. Ideal for rip, crosscut, mitre, dado and bevel cutting! Limited quantities at this LOW, LOW price.

Chrome Vanadium 29 Pc. DRILL SET



Clearly bite through hardwoods, plastics, aluminum, iron and toughest steels. Unconditionally guaranteed for thousands of drillings. Full jobber length. Sizes by 64th from 1/16" to 1/2". There are only a limited quantity of sets available at this low price, so hurry! Also available with Turned Down Shanks to fit all 1/4" drills. In individual pocket roll.

\$6.49 ppd.

\$8.95 ppd.

60 Pc. Set Wire Gauge CHROME VANADIUM DRILLS



Top quality high test Chrome Vanadium Drills designed for speed drilling through toughest steels, woods, plastic, iron and aluminum. Precision ground, long-lasting cutting edges.

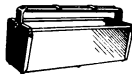
Guaranteed to give years of satisfaction. A full 60 pc. set, Nos. 1 through 60. A \$14.95 value plus 35c NOW ONLY **\$5.40** plus 35c pp. & hdlg. Same set above with Index Container—Only **\$6.65** plus 35c pp. & hdlg. Also available 61-80 set of high quality drills in plastic kit with marked pocket for **\$2.50** each drill—ONLY plus 35c pp. & hdlg.

Extra Heavy—.006 Gauge BLACK PLASTIC TARPULINS

Waterproof, Resistant to Dust, Air, Grease, Unaffected by Heat or Cold Covers and protects hundreds of items in and around the Home, Cottage and Farm. Lightweight for easy handling by one man yet strong enough to withstand the roughest handling. Solid Brass grommets every 18" for easy and secure tie-down. Use OUTDOORS as Frost Cover; Cordwood shrubs, trees, plants; Mulching; Auto, Boat or Private Plane Cover; Wind Break; Temporary Shelter; Silage Cover; Hay and Straw Stack Cover. Use INDOORS as Machinery Cover; Mechanic's Tarp; Drop Cloth; Building Material Cover; Temporary Window; Merchandise Cover; Woolen Storage; Porch Protection; Picnic Cloth; Play Pen Pad, etc.

6'x9' \$ 4.99 20'x20' \$21.50
 9'x12' 7.50 20'x30' 31.50
 20'x10' 12.50 Prices include postage.

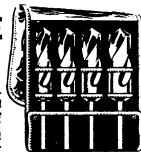
All Purpose, Heavy Steel TOTE-ABOUT



\$1.98
 plus 35c PP. & Hdlg.

This attractively styled Tote-About, measuring 16"x5 1/2"x7" is ideally suited for household or garden tools, hobby craft and art supplies, children's toys and many other indoor & outdoor applications! Constructed of heavy-duty steel with baked-on metallic finish. No sharp or rough ends. Adjustable handles with slot for saw, 2 dividers on tray handle holds nails, screws, bolts, etc. Easily assembled in just 5 minutes.

Bigger drills at low, low prices! 4 Pc HIGH CHROME SPEED SET



Another of Scott Mitchell's famous tool bargains! The original \$12.50 price is right on the package, but you pay only \$9.95! A wonderful buy for advanced hobbyists, carpenters, construction workers, factories, machine shops. Made of high quality, specially hardened steel, with turned down shanks to fit all 1/4" electric drills. Zip through hardwoods, aluminum, iron, plastics, even the toughest steel! Sizes 5/8", 3/4", 7/8", 1". Come in numbered pocket, snap closure tool roll.

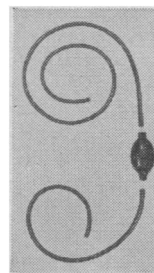
Reg. \$12.50
NOW \$9.95

plus 50c pp. & hdlg.

Extra Special! 11 Pc. Set, Reg. \$99.50. NOW ONLY **\$29.95** plus \$1 pp. & hdlg. Same features as 4 pc. set. Sizes: 1 1/8", 1 1/4", 1 3/8", 1 1/2", 1 5/8", 1 3/4", 1 7/8", 2", 2 1/8", 2 1/4", 2 3/8", 2 1/2", 2 5/8", 3".

AUTOMATIC SIPHON PUMP

Now-siphon any liquid automatically, safely, without putting tube to mouth! Squeeze bulb of this all new type siphon, liquid starts to flow immediately! Transparent valves let you see liquid flowing! Siphons, pumps gasoline, water, any liquid. Even acids, corrosives! For cars, boats, power mowers; campers, plumbers, doctors, chemists, factories!

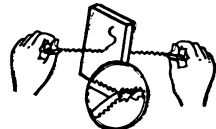


Acid resistant. Over 7 ft. long overall! Sold with a money back guarantee. Price **\$1.98** postpaid.

Flexible Steel

POCKET SAW

Cuts in
Every Direction



Made of super quality silicon steel, the exclusive interwoven blades cut quickly, easily yet never clog. Ideal for hobbyists, scouts, outdoor sportsmen, gardeners, farmers, campers, etc. to cut wood, formica, rubber, cork, plastics, ice, non-ferrous metals and most anything else... in any direction! Cutting teeth guaranteed not to wear. Rust resistant. Easily rolls up for carrying in plastic pocket-pac. Weighs less than a pack of cigarettes. Imported from France; used by French Military and British Commandos.

SPORTSMAN—20"—.063 dia.—98c ppd.
 WOODSMAN—20"—.095 dia.—\$1.49 ppd.
 COMMANDO—35"—.095 dia.—\$1.98 ppd.

Hobbyist, Handyman, Housewife, Gardener

SQUEEZ-CLIP KIT



Fixes or Fastens easier, faster, stronger than a stitch, staple, screw, nail or tie.

The Squeeze-Clip Kit can do so many things, you'll wonder how you ever did without it! You get a special pliers with indexed slots in the jaws plus 500 assorted size galvanized, rust-resist clips. The clips, shaped like a staple, fit into the pliers. Then, just squeeze lightly and you've got a streamlined, triangular ring of a thousand uses. Use to install auto seat cover, repairs canvas tears, belts, straps, attach vines and plants to stakes and trellises, clip papers, join lengths of rope, etc. An invaluable aid to home & industry.

Only **\$1.98** plus 35c pp. & hdlg.

Surgical Steel — Hand Ground

Set of 12 CARVING KNIVES

\$2.00 ppd.

The sharpest, keenest ground, surgical steel blades we have ever seen—sharp enough to split a human hair in two 12 different shapes and edges can do every job of wood carving, model making, linoleum cutting, sculpting and whittling imaginable. Each blade has a 4 1/2" long hardwood handle for easy gripping. A heavy duty blade is firmly attached by means of a brass ferrule to insure long, continued rugged use. Each surgical steel blade is precision hand ground to easily and quickly notch and cut any shape you wish. A sensational all-purpose set, well worth \$5.95.

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Order Today and Save. Minimum order \$1.00. Send Check or M.O. C.O.D. orders plus fee. Money Back Guarantee. Protects you against risk.

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