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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



"Flying Saucer"

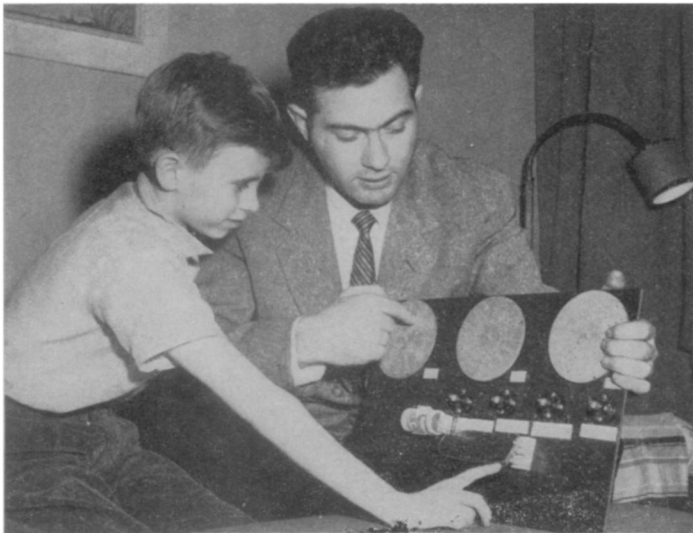
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A SCIENCE SERVICE PUBLICATION

FORECAST THE WEATHER WITH THE NEW 1958 GENIAC®

Included in every 1958 Geniac® Kit, this remarkable circuit now helps you forecast the weather by machine, and comes with all the 400 components and parts that let you build over 125 electric brain machines.

Teachers and Scientists: *Design Your Own Machines!*



1958 GENIAC KIT CONTAINS (1) a complete 100-page text, "Minds and Machines"—a basic introduction to computers. (2) "How to Construct Electrical Brains at Home"—a fully illustrated text book on basic computer design theory and circuits with specific instructions for building 125 circuits. (3) Wiring Diagram Manual. A special booklet with full scale diagrams. (4) Beginners' Manual—fifteen extra experiments to teach the basic symbols of electric circuits. (5) Over 400 components and parts.

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OVER 400 COMPONENTS AND PARTS

Circuits operate on one flashlight battery, and use ingeniously designed parts. 1958 GENIAC Kit has been constructed by the original inventor to provide all the advantages of previous electrical brain construction kits plus what we have learned in answering the questions and examining the new designs created by hundreds of users.

SELF-CONTAINED COURSE IN COMPUTER DESIGN

Each GENIAC comes as a self-contained course in computer design. All instructions are so simple that we have records of intelligent twelve-year-olds designing factoring machines and puzzle-solving circuits—while hundreds of schools and industrial training programs have incorporated our kits in their curricula.

YOUR COST FOR GENIAC KIT: ONLY \$19.95 POSTPAID

The coupon will bring your GENIAC® Electric Brain Construction Kit and Manuals, with Design-O-Mat,® for only \$19.95 postpaid. You may return the Kit within 7 days if you are not completely satisfied. For schools we offer bulk rates on extra texts and parts; for teachers, we offer 10% deduction on GENIAC if ordered for use in institutions. Be sure to ask for the 1958 GENIAC® with Design-O-Mat.® Send for your Kit today!

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Oliver Garfield Co., Inc., 108 E. 16th St., New York 3, N. Y.

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\$19.95 (East of Mississippi)
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Returnable in seven days for full refund if not satisfied. I enclose \$.....in full payment.
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Kodak reports on:

big deal over 0.009 roentgen . . . why they still use cellulose in lacquer . . .
color films for sophisticates

A modest contribution

Man comes home from work and his wife asks him what kind of a day he's had. "Same old yackety yak," he reports. "Heap-big all-afternoon powwow over the fact that whereas it used to take 0.019 roentgens of radium gamma radiation to produce a density of .05, they have now made x-ray film that takes 0.010 roentgens of gamma radiation to produce a density of .05. Cauliflower tonight again?"

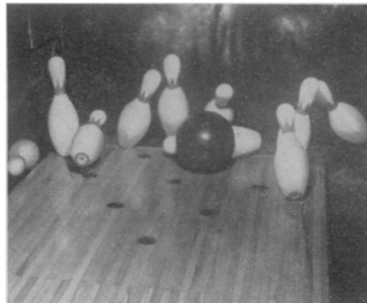
Eastman Kodak Company is pleased to announce that significant progress has been made in its continuing program of improving the sensitivity of film to ionizing radiation. One result of this program is that physicians are enabled to obtain required diagnostic information from *Kodak No-Screen Medical X-ray Film* with fully 50% less exposure of the patient to x-rays.

Another result, of interest to those engaged in industrial radiography and in the atomic energy field, is that the film badges worn to check on their body exposure to radiation can now be made capable of at least 50% more sensitivity than previously.

While it is realized that the end of the effort to reduce human exposure to radiation is nowhere in sight, it is felt that even modest technological advances in this direction serve the interests of general welfare.

Full information about these monitoring films is obtainable from Eastman Kodak Company, Special Sensitized Products Division, Rochester 4, N. Y.

The polymer that steers easily



Know what looks good for the base of the lacquer to protect these things? Cellulose acetate butyrate.

Twenty-seven years of our life we have given to cellulose acetate butyrate. If you care to devote the next two or three minutes of yours to the subject, you will learn as much as a mildly interested outsider can take.

From each of the anhydroglucose units that constitute the links of the long chains of cellulose, three hydroxyl groups protrude. Hydroxyls of adjacent chains attract each other. The affinity keeps the chains packed together and thus maintains the structure of the plant tissue. This doesn't serve man's whims as well as it used to. The hydrogen bonds can be broken and the unchanged chains put into new shapes such as cellophane sheet and continuous rayon filaments. Such regenerated cellulose, however, has few parameters to play with. It does not melt. There are no volatile solvents from which it can be recovered undamaged.

To provide more room for maneuver, the next step (conceptually, if not historically) is to replace the protruding hydrogens with acetyl and butyryl groups. After drying, the product looks rather like the original wood pulp or cotton linters before the treatment with acetic and butyric acids or anhydrides. Now, however, the chains no longer cling together so. Heat them and they mobilize to a viscous liquid long before a destructive temperature is reached. They are likewise free to be separated and whirled off into liquid mobility by a grand variety of organic solvents useful in lacquers. Because of the randomness with which acetyls and butyryls have replaced the hydrogens, the lockstep is broken. Chain molecules move in small aggregates, governed by statistics. The statistics are readily adjustable in the manufacturing process. An acetyl is larger and less attractive than a hydroxyl, and a butyryl is larger and less attractive than an acetyl. Their relative proportions and the length of the molecule are subject to fine control.

Longer molecules mean higher viscosity at a given concentration; with this goes toughness of the film left after evaporation of the solvents. If you want higher solubility, lower specific gravity, better

tolerance for lower-cost solvent extenders, better compatibility with resins and plasticizers, more flexibility and moisture resistance in the films, you increase the ratio of butyryl to acetyl groups. If you want more resistance to grease and assorted chemical agents, better tensile strength and hardness of the films, and higher melting point, you decrease the ratio of butyryl to acetyl. To control embrittlement during weathering, you back off and restore about one in twelve of the replaced—

Does any of this really matter to you? If so, we shall be overjoyed to send without charge a new 75-page data book, "Cellulose Acetate Butyrate." Address Eastman Chemical Products, Inc., Kingsport, Tenn. (Subsidiary of Eastman Kodak Company). The book even tells what we have for sale in this line.

L is for long, S is for short

We have a refinement in the kind of color film that can be printed to gorgeous big *Type C* color prints for dry mounting or to any number of even more brilliant color transparencies, large or small. The reference is to *Kodak Ektacolor Film*. Now it comes in *Type L* for long exposures and *Type S* for short exposures.

If you were naive you would ask, "Why should I pick long exposures if I can have short exposures?" But you don't ask that.

You know that while high film sensitivity is the aim, nevertheless the departure from a strict reciprocity between the effects of illumination and exposure time is different between the three emulsion layers of a color film, leading, hitherto, to color imbalance unless the exposure time is kept within narrow prescribed limits. You therefore experience a feeling of release when we tell you that the barriers on both sides have fallen: *Type L* is balanced for exposure times from 1/5 second to 60 seconds, such as encountered in photomicrography and photomacrography; *Type S* is good down to the briefest flash of a gas discharge lamp.

In case you have a friend who fails to grasp your explanation of the preceding paragraph and who has questions about this Type C—Type L—Type S business, tell him to write to Eastman Kodak Company, Professional Goods Division, 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