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Chairman C. V. SMITH'S
MESSAGE

On

Page Ten

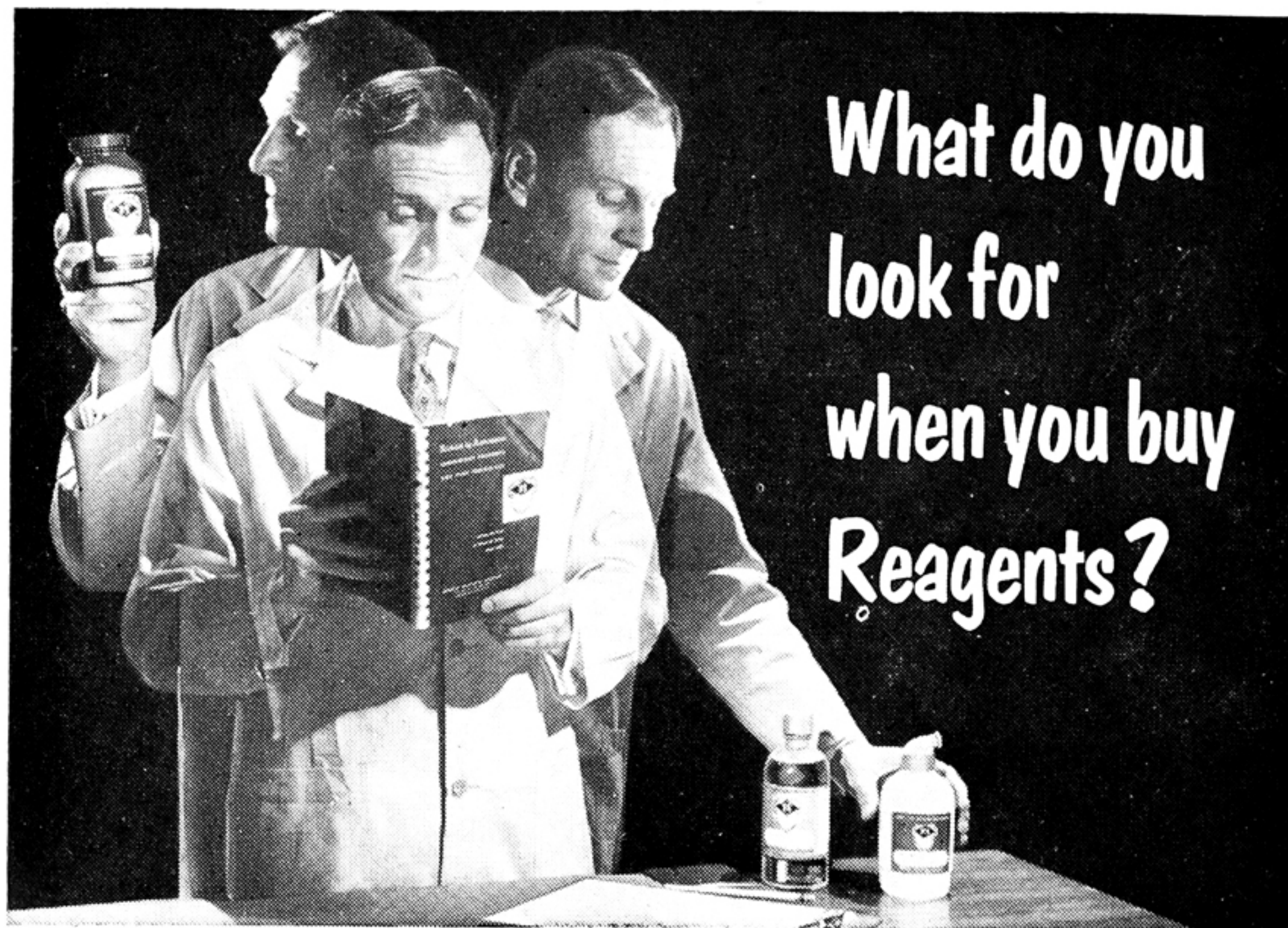
The

**PUGET
SOUND**

CHEMIST

BULLETIN OF THE PUGET SOUND SECTION OF THE AMERICAN CHEMICAL SOCIETY

OCTOBER, 1952



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SETTING THE PACE IN CHEMICAL PURITY SINCE 1882

The **PUGET SOUND** **CHEMIST**

Published by the Puget Sound Section of the American Chemical Society

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			Liquid	Vapor
Glacial Acetic Acid	100°C.	1265	None	None
20.24% Hydrochloric Acid	100°C.	1265	"	"
Nitric Acid Concentrated	100°C.	1265	"	"
Sulphuric Acid "	100°C.	1265	"	"
Cleaning Solution (H ₂ SO ₄ -Dichromate)	100°C.	1265	"	"
Aqua Regia	Room Temp. (25°-30°C.)	1265	"	"
Fuming Sulphuric Acid	Room Temp. (25°-30°C.)	1265	"	"
Toluene	Boiling (111°C.)	306	"	"
Varsol	Boiling (165°C.)	306	"	"
Turpentine	Boiling (150°C.)	306	"	"
Carbon Tetrachloride	Boiling (77°C.)	306	"	"
Methyl Ethyl Ketone	Boiling (80°C.)	306	"	"
Iso-amyl Acetate	Boiling (142°C.)	306	"	"
Aniline	150°C.	306	"	"

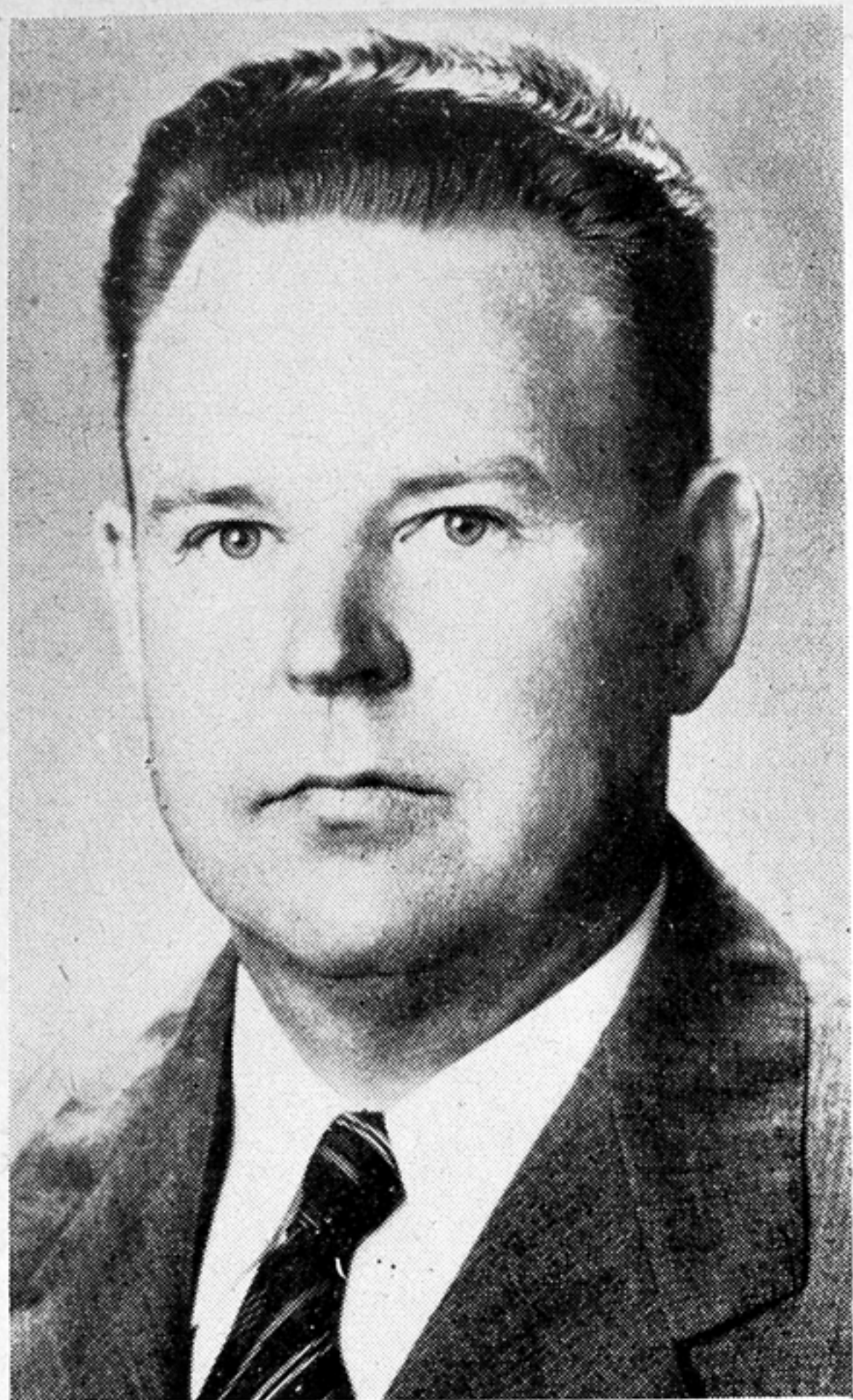
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OCTOBER SPEAKER



H. H. STRAIN

BIOGRAPHY

Born in San Francisco in 1904, Harold H. Strain obtained his undergraduate and graduate experience at Stanford University. There, under the tutelage of E. C. Franklin, he studied the aldehydes and ketones of the ammonia system of compounds.

In 1927 Strain was employed by the Carnegie Institution of Washington at its Coastal Laboratory at Carmel, California, and in 1929 at its Division of Plant Biology at Stanford University. At the Stanford Laboratory Strain undertook the isolation and purification of carotenoid pigments by the use of chromatographic adsorption methods. These studies led to the utilization of the adsorption method for studies of the chlorophylls and of many other substances as well as of carotenoids. The routine of these ad-

sorption studies was broken by a year spent at the Carlsberg Laboratory, Copenhagen, in 1937-38 as a Fellow of the Rockefeller Foundation and by a summer spent at the Hawaiian Islands studying the pigments of algae.

In 1949 Strain joined the Chemistry Division of the Argonne National Laboratory. There his investigations have concerned the chromatographic adsorption of inorganic compounds. He has developed a method for the continuous resolution of mixtures by combination of electrical migration and chromatographic adsorption methods.

Strain has two books to his credit, a monograph on the leaf xanthophylls and a summary of chromatographic adsorption methods. He is a member of the American Chemical Society and of several scientific fraternities.

Summary

THE PRINCIPLES OF CHROMATOGRAPHY

By Harold H. Strain

The preferential distribution of solutes between two phases and the driving force of flow of solvent have been widely employed as the basis of chromatographic absorption methods. These phenomena have been investigated in many ways, and the observations have been utilized for interpretation of chromatographic behavior.

The formation of uniform chromatographic zones and the degree of the separation of mixtures depend upon the properties of the sorptive phase upon the dynamic distribution of the solutes between the two phases. Variations of these effects have been encountered with different solutes. Many of the effects may be utilized to improve the chromatographic separations.

Chromatographic principles are similar to those utilized in a variety of analytical methods based upon differential migration of the components of mixtures. Examples are differential electrical migration, differential centrifugation, and countercurrent extraction.



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OCTOBER MEETING

PUGET SOUND SECTION

OF

AMERICAN CHEMICAL SOCIETY

TIME - Friday, October 24th, at 8:00 P. M.

PLACE - Room 131, Bagley Hall, U. of Washington

SPEAKER - Dr. Harold H. Strain of Argonne Nat.
Laboratories

SUBJECT - The Principles of Chromatography

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THIS IS A JOKE, SON

It seems that a certain Mr. Jones suffered an ailment, the symptoms of which were shortness of breath, protruding eyes, a redness of the face and vertigo. After suffering this ailment for a number of years he finally consulted with a doctor and was told his tonsils would have to be removed. He underwent the operation and for a short while felt much better. Not long afterwards the old symptoms returned in full force and Mr. Jones consulted with another M. D. After a careful diagnosis the M. D. returned with the verdict that Mr. Jones and his appendix would have to be separated. Reluctantly, Mr. Jones parted with his appendix and again for a short period felt much better, but soon the old symptoms returned with a vengeance. Now consulting a specialist, Mr. Jones was advised that he had six months to live. Determined to make his last six months on earth as pleasant as possible, Mr. Jones sold all his possessions and took a trip around the world. On returning home near his appointed day and feeling the hand of death close by, it occurred to him that he needed a new suit to be buried in. Feeling dizzy, his eyes bulging out of his head, his breath coming in great gasps, Mr. Jones repaired to a haberdashery and ordered a new black suit of clothes. In the course of making the purchase, the clerk suggested a new shirt might be in order, to which our friend, Mr. Jones, agreed. Would Mr. Jones like to give his size, inquired the clerk. To which Mr. Jones replied fourteen and one-half. "Oh no," replied the clerk, "You need sixteen and one-half. If you wear size fourteen and one-half you will find yourself short of breath, your face will become red, your eyes will bulge out and you will feel dizzy."

Why don't you laugh?

Accidents are preventable but most Americans act otherwise.

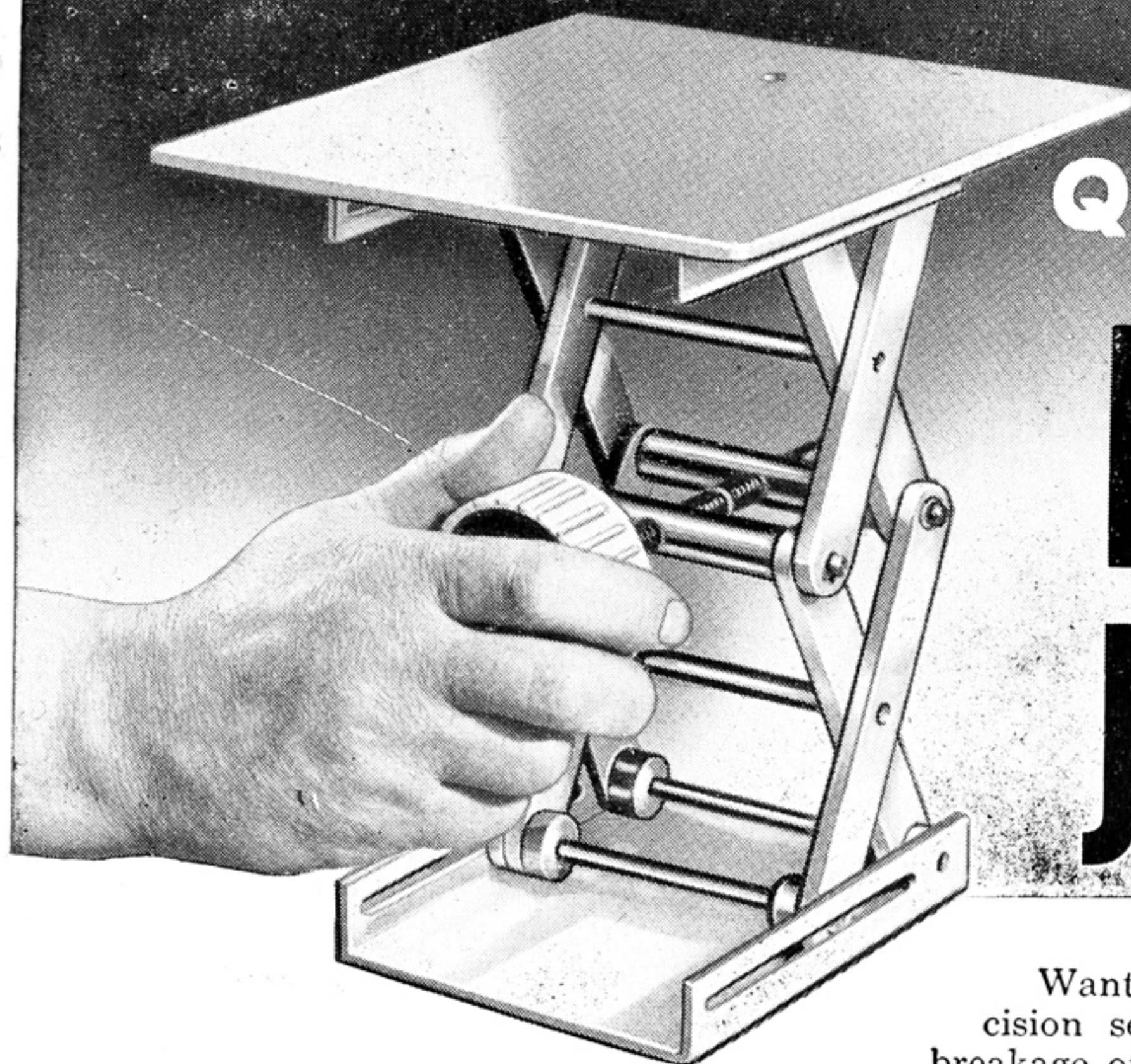
Some of the new hot-rods can do 150 mile an hour, unfortunately.

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C. V. SMITH

CHAIRMAN'S MESSAGE ON MEMBERSHIP

A decline in membership from over 500 last year to about 470 currently is contrary to the national trend. This has cost the Puget Sound Section one councilor—we are back to the “one-horse” stage with an alternate. Our “one horse” A. J. Norton has just returned from the September council meeting with the big news that the membership count per council member has been raised from 250 to 280. This was necessary to keep council meetings from becoming too unwieldy as the national membership grows.

You are aware of the fact, no doubt, that the A.C.S. is the largest technical society in the world and is growing each year. You are also aware of the fact that the Puget Sound section is not an infant, having been formed in 1909. It is also quite apparent that we are asleep at the wheel, because we have only one-third to one-half of the chemists who are eligible for membership. Somehow the spirit which drove our pioneers 45 years ago has to be revived. Your participation and suggestions are needed to make the activities purposeful and interesting to members, prospective members and those who observe.

Most chemists like to think of themselves as professionals.

Chemists can take pride in being sound pillars in world affairs and there is no doubt but what the American Chem-

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ical Society has done much to direct their efforts.

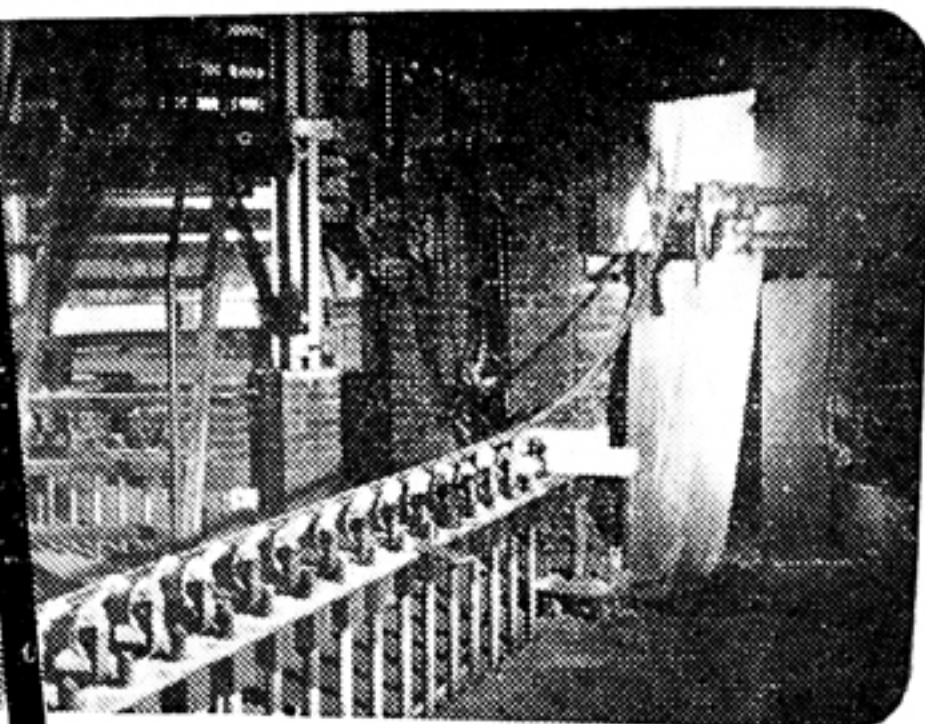
There is still much for the chemist to contribute. To be earmarked as a true professional he should contribute more than is required and he should do it in a manner which attracts favorable attention. Professional recognition comes through proper group behaviour.

Membership in the American Chemical Society is the one best step toward meeting such requirements for a better world—for the chemist as well as the others he serves.

Why join or why did you join the A.C.S.? In answer, there are 60 arguments covering Publishing, Standardization, Education, Meetings, Research, Professional Status and general which we propose to publish in November. We must undertake—individually—and as a group a program of building up our local society before we reach the silly but not impossible situation where our membership falls below the requirements for one councilor. If we were really awake



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we should have 1000 active members in the Puget Sound Section. Talk up A.C.S. membership. It is a must for chemists in the long run.



HUNGRY SOIL ROBS CROPS

Hungry soil sometimes turns against crops and robs them of essential plant foods, according to a report to the American Chemical Society's 122nd national meeting by two chemists of the Campbell Soup Company's department of agricultural research.

Spray tests to find out whether phosphorus and nitrogen compounds could be supplied to tomato plants growing in poor soil by absorption through their leaves showed that the plants did absorb the nutrients but sacrificed them to the phosphorus and nitrogen-deficient soil, said the report, which was prepared by R. L. Isaacs, Jr. and Dr. J. B. Hester.

It was also observed that nitrogen and potassium are washed out of the leaves of tomato plants during excessive rainfall, the report stated.

"It has been reported in the literature that considerable plant nutrients (nitrogen, phosphorus, potassium, and particularly magnesium) are absorbed through the leaves and stems of the plants," said the report. "There is no question about this being true. It has been observed by the authors that nitrogen and potassium also leach from the leaves of the tomato plant during excessive rainfall. So, it is not a one way phenomenon.

"Investigations were initiated to ascertain if tomato plants grown on soils poorly supplied with nutrients and showing both phosphorus and nitrogen deficiencies could absorb plant nutrients through the leaves. Using a Tifton sandy loam with an acid soil reaction and a depleted phosphorus and potash condition, tomato plants grown without fertilizer in the row were sprayed with a complete mixture (specially prepared 7-7-14 mixture, 10-52-17, and 13-26-13) as well as urea alone. The plants absorbed the plant nutrients but sacrificed them to the soil. It is obvious that there is a

competition between the soil and the plants for certain plant nutrients, particularly phosphates.

"The soil must be supplied with phosphatic materials in order for the plant to be able to utilize the nitrogen and potash in the form of spray material. Perhaps much of the literature on the subject of the ready absorption of the nutrients, particularly phosphate, is based on sand culture work where there is no competition between the plant and soil.

"In conclusion it can be safely stated that nitrogen sprays can be effectively utilized as a supplemental method of fertilization."



MODERN TIMES

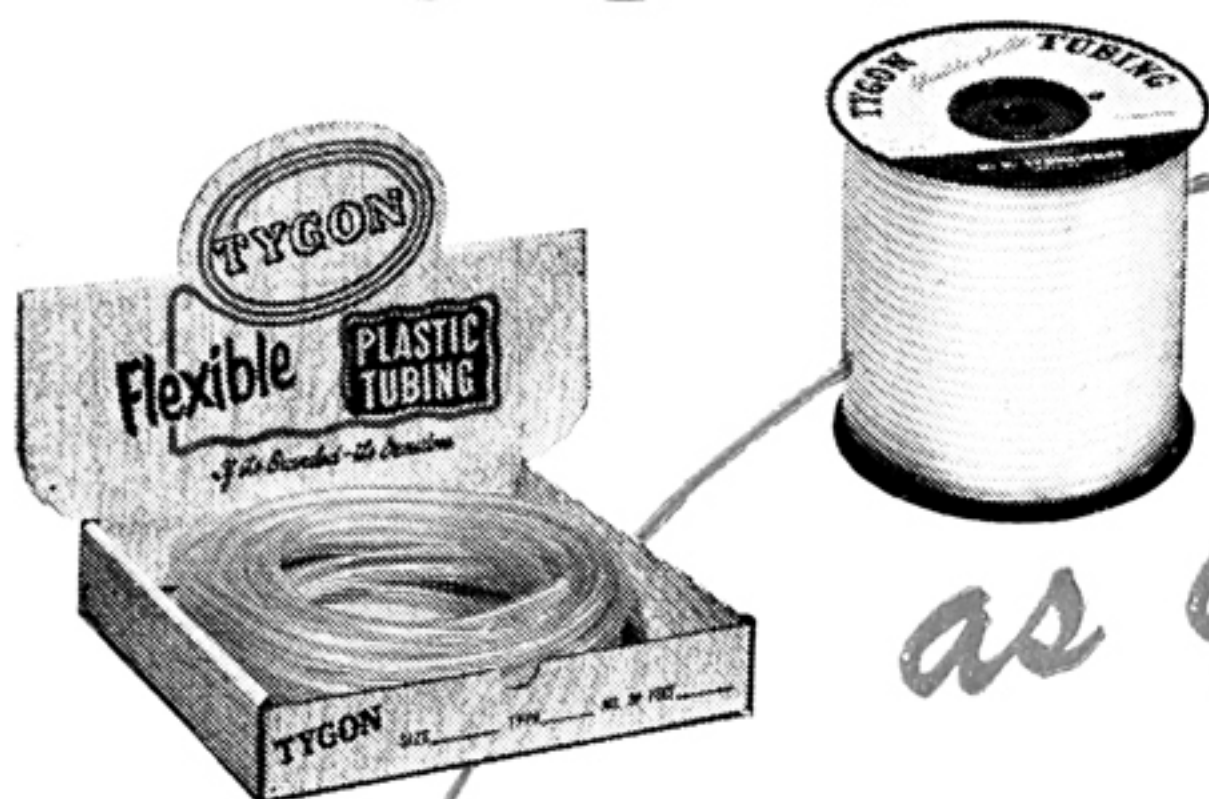
The homo sapien is perhaps a million years old. Of the duration of his existence, most has been spent in savagery, a small part in barbarism and an insignificant few thousand years in civilization. Modern capitalism is only a few hundred years old preceded as it was by long periods of barbarism and chattel slavery.

Set in these coordinates, the struggles of modern times seem very insignificant indeed. It is a good question, however, whether or not these are proper coordinates into which should be framed the social, political and economic problems of our day. A problem framed in appropriate coordinates may offer ready solution; the same one framed in other coordinates, none at all.

More specifically, the growth of bureaucracy in government, the growth of government control in industry and for that matter of many phases of our daily lives, is lamented by many as the greatest evil of modern times. This state of affairs exists not alone in the United States, but also in every country in the world today. One might well ask whether or not it is part and parcel of the growth (or decay) of modern civilization. Set in these coordinates the cry to roll back government controls is as futile as a cry to hold back the sun.

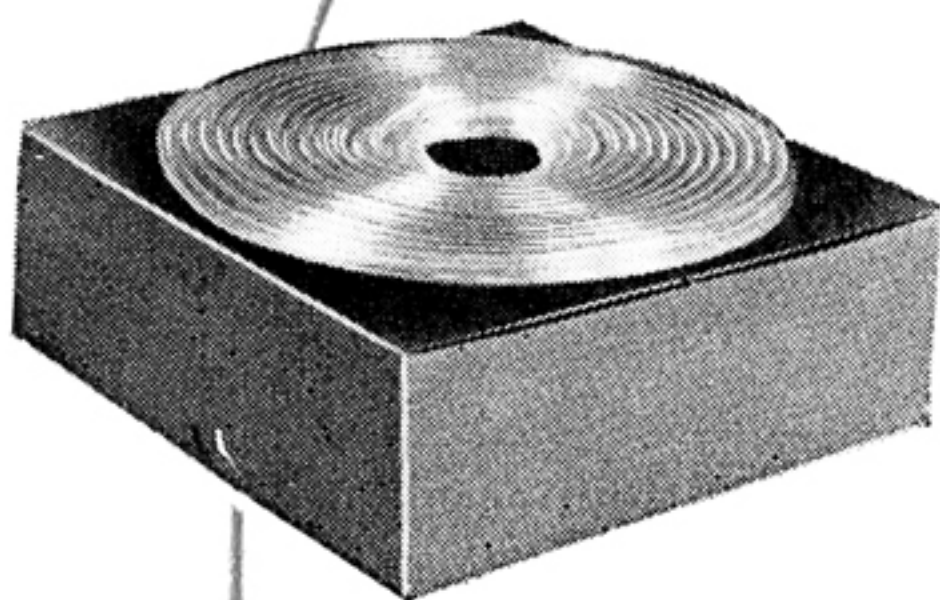
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of government controls, for these shall come as the social, economic and political exigencies require, but whether or not the seat of government power shall remain with the people.

NOISE KILLS GERMS

Noise so powerful that it will kill the germs is being harnessed for use in purifying water supplies and sterilizing milk. Miss Lillian A. Russell of the Illinois State Water Supply told the American Chemical Society's 122nd national meeting today.

A quartz "ear" that can hear sound pitched sixty times as high as the top note the human ear can register is making records of the sound patterns which produce lethal effects on bacteria, said Miss Russell, who reported on work done in collaboration with Dr. A. M. Buswell, chief of the Survey, and Dr. R. McL. Whitney of the University of Illinois Department of food technology.

Microorganisms of many types succumb readily when sound of extremely high frequency is turned on them, but in the past it has not been possible to measure the exact amount of sound energy necessary, the most effective pitch, and other conditions required for the economical application of the new method, Miss Russell stated.

Before "ultrasound" can become a commercial tool for sterilization the necessary machinery must be designed, conditions must be properly controlled, and the rate at which sterilization can take place must be determined, she pointed out.

"The production of ultrasonic energy is based upon a peculiar property possessed by quartz," Miss Russell explained. "Pressure on the two parallel faces of a properly cut quartz disc causes electric charges of one sign (positive or negative) to appear, while release of the pressure causes charges of the opposite sign to appear on the face of the crystal. Conversely, if placed in an alternating high frequency electric field which sup-

plies charges of first one sign and then the other to its faces, the crystal experiences a periodic compression and expansion in thickness at the same frequency as that of the electric field. The rapid mechanical vibration produced is sound, but if the number of vibrations per second is greater than 16,000 we do not hear anything.

"At the University of Illinois high intensity sound of 1,000,000 vibrations per second is used. At such high frequencies sound begins to have some of the properties of light. For example, the sound is generated as a slender beam perpendicular to the face of the crystal similar to a searchlight beam and may be focused with a lens much as a light beam can.

"Unlike light, however, high frequency sound is rapidly dissipated in air so that at a very short distance from the crystal no effects are felt. But under water the picture is quite different. If the finger is held under water in the path of the beam, at first a strong vibration is felt and then a deep burning pain as the sound passes through the bone. prolonged exposure can be injurious.

"The work at Illinois is directed ultimately toward the purification of water supplies and the sterilization of milk and dairy products.

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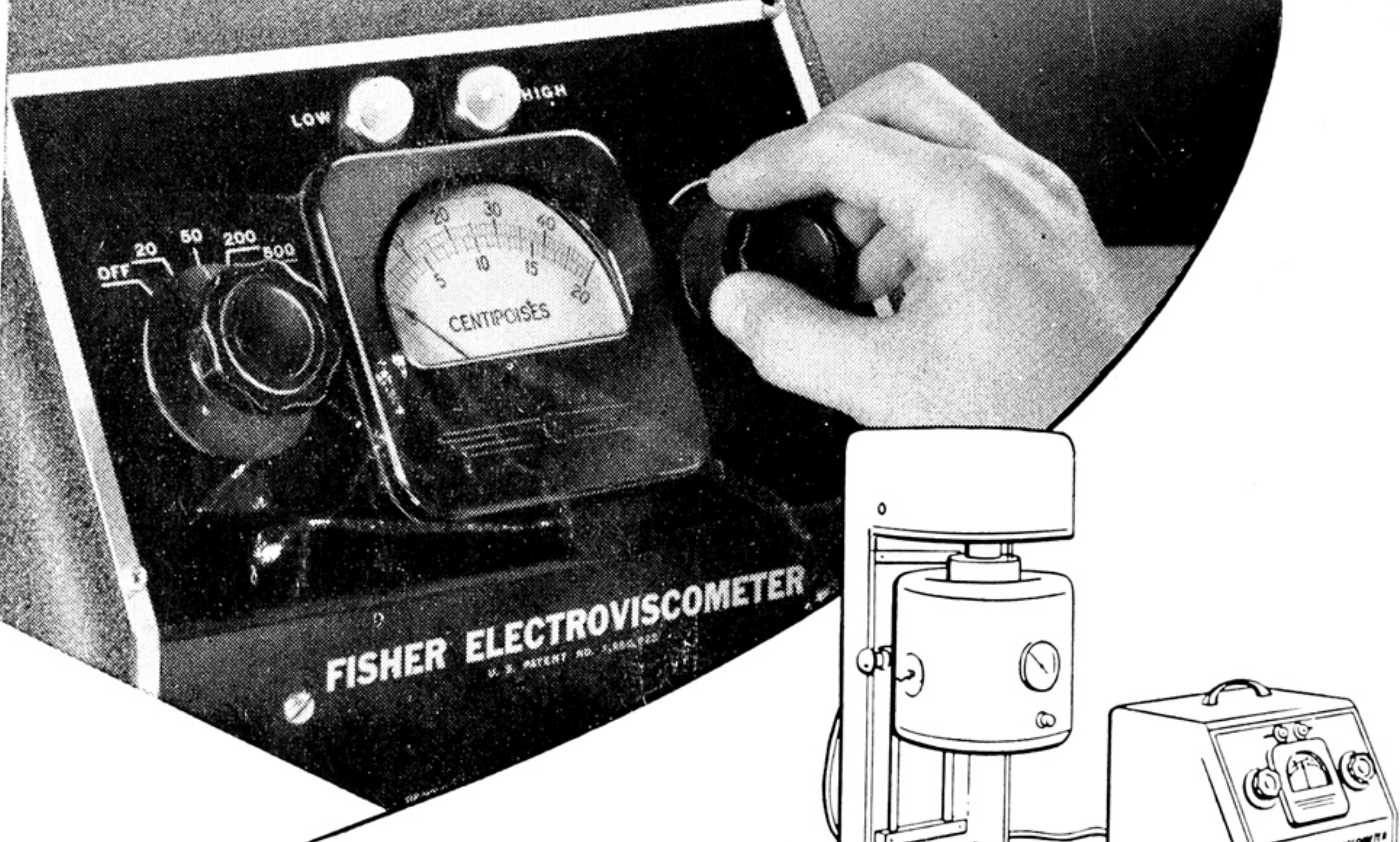
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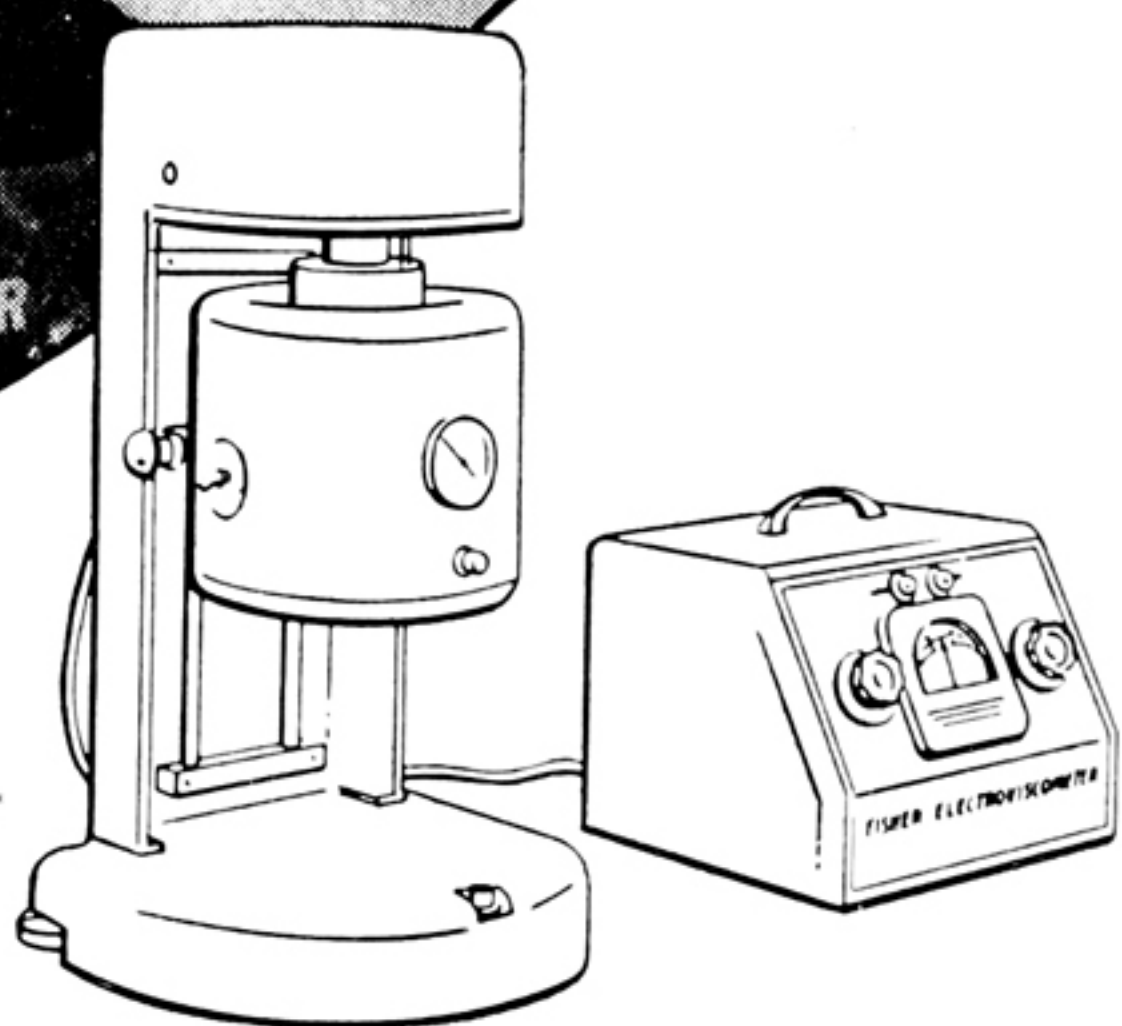
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