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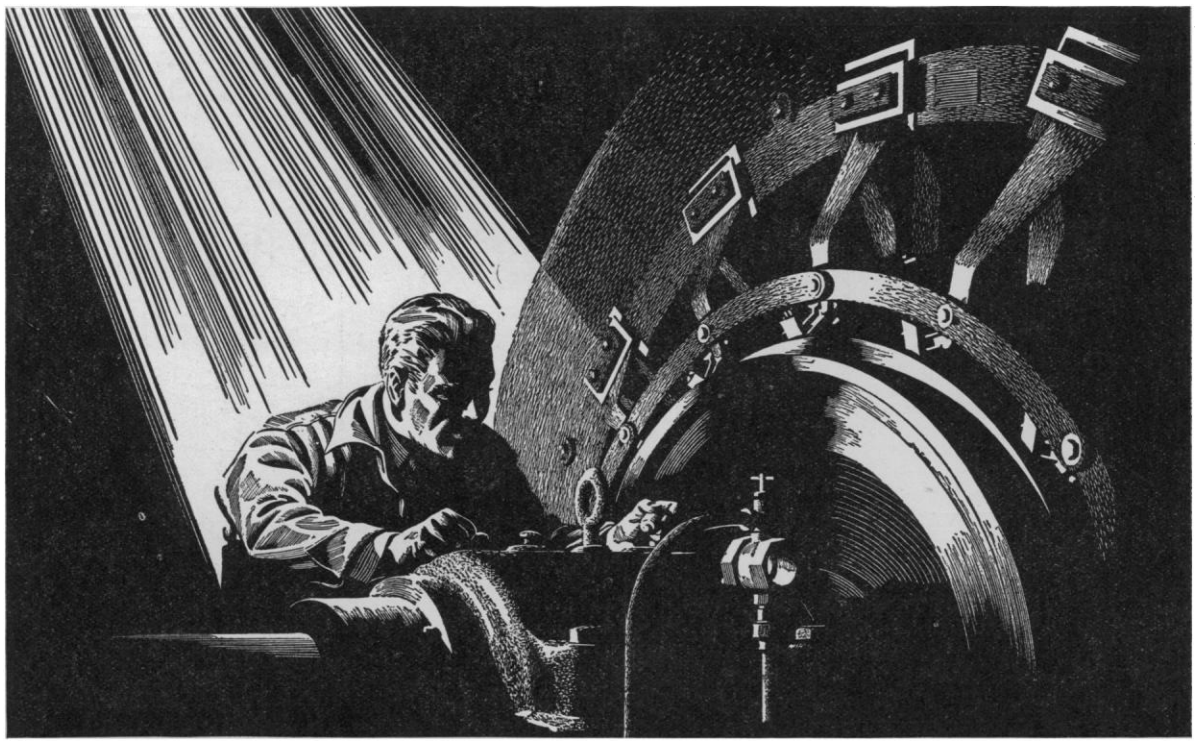

Electricity Showed Industry

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Dirt has cost American business and industry millions of dollars annually.

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Today the *Precipitron* is serving scores of industries of all types. You will find it clearing the air for manufacturers of precision aviation instruments, in steel mill motor rooms, in power plants, textile mills, as well as in stores, shops and buildings. The Westinghouse *Precipitron* is doing an important job in helping to keep the wheels of business and industry dirt-free and running smoothly.

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SMACO

THE IMPORTANCE of choline in nutrition is now more widely recognized as a result of new investigations showing its relationship to liver cirrhosis[1] and renal damage.[2] Under specific dietary conditions a deficiency of choline results in fatty infiltration of the liver in rats[3] and perosis in chicks.[4] Choline is definitely involved in the metabolism of the sulphur containing amino acids.[5, 6]

It has been suggested that choline is a factor in the B-complex[7] and because of this there is increasing use of choline chloride as a routine supplement in nutritional research especially where highly purified diets are employed.

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RESEARCH LABORATORIES
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FUTURE SOURCES OF POWER[1]

By Professor C. C. FURNAS

YALE UNIVERSITY

THE sun's rays shower as much energy on the earth's surface in one minute as the entire human race utilizes in one year. Despite the presence of this bountiful and unusual flow of energy, a large part of the struggles of the human race are concerned with acquiring and controlling sources of power. Evidently our state of development in the utilization of power is still rather crude. A review of the various practical sources of the present day is in order.

PETROLEUM

The energy supply which is most critical in America is that of petroleum. At the present time we are using considerably over a billion barrels per year. The known proved reserve of petroleum in the ground is 14 to 17 billion barrels, depending on who does the estimating. Thus the petroleum actually in sight is only about a twelve-year supply. But new discoveries are being made constantly so most of the people in the petroleum industry say they are not worried about the supply, at least for the present generation. It is a little discouraging to note, however, that the new discoveries are not quite keeping pace with use so the pinch of partial depletion may come sooner than the optimists anticipate.

There may be discoveries of great new fields, but the prospects of that are not very good. There is the possibility of extensive fields lying under the ocean

[1] Summary of an address before a joint meeting of the Rochester, Syracuse and Cornell sections of the American Chemical Society, Rochester, N. Y., October 4, 1941.

cleaner motor provided sufficient suction for our purposes. Inlet tubes were specially constructed with one-half inch bore and with the submerged end a perforated bulb of the bubbler type to prevent clogging or unequal pressure from the glass beads.

Calibration of the air flow was determined by the displacement of air by water in a two-liter flask and checking these rates with differences in the manometer levels. Best results were obtained at relatively low rates indicated by the gentle bubbling of air through the broth and beads. Optimum speeds were between 3.6 and 9.0 liters per minute. Too strong suction tended to cause splashing and sucking of broth through the outlet of the flask. As in bacterial analysis of milk, the number of colonies found in plates poured with one and two cc samples of broth are multiplied to the number which should be present in the entire 50 cc. Immediate pour plates of the broth are not necessary since significant bacterial growth does not take place for an hour or more even at room temperature. However, if immediate pouring is not practical it is advisable to store the flasks in the refrigerator. Colony counts of samples ranging from 0.5 cc to 3 cc reveal a straight line relationship of size of sample to number of colonies.

Tests on the efficiency of this machine by attaching it in series to the Wells Air Centrifuge, and tests where two of the bubbler pumps are set up so that the exhaust of one is attached to the inlet of the other reveal that bacteria of air samples are more thoroughly absorbed by the bubbler pump than the air centrifuge. Table 1 shows the magnitude of this difference in

TABLE 1

RELATIVE EFFICIENCY OF THE BUBBLER PUMP AND AIR CENTRIFUGE AS SHOWN BY AIR SAMPLES FROM THE APPARATUS CONNECTED IN SERIES

Apparatus	Unit	Colony counts: 1 ml.	Colony counts: 2 ml.	Estimated colonies av. in 50 ml.	Count in 10 cu. ft.
(A) Two bubbler pump units in series.	Pump No. 1	5	8	225	990
	Pump No. 2	0	0	0	0
(B) Centrifuge in series to the outlet of the bubbler pump.	Pump	6	10	262	1,190
	Centrifuge	–	–	–	1

The above experiments were conducted in the same room on the same day.

colony counts when the machines are arranged in series. When separate runs are made in the same room by the two machines colony counts indicated by the bubbler pump are usually several times that found in an equivalent sample of air from the centrifuge. Table 2 shows sample protocols of such runs.

Preliminary experiments indicate that accurate evaluations of the bacterial content of air under the natural conditions of a hospital ward are possible with these bubbler pumps. Experiments are in progress involving the correlation of dust and bacteria counts and the effect of ultra-violet rays on the bacteria of irradiated rooms.

TABLE 2

COMPARISON OF BACTERIAL COLONY COUNTS IN AIR SAMPLES: PARALLEL RUNS IN AIR CENTRIFUGE AND BUBBLER PUMP

Room	Color counts: 1 ml.	Color counts: 2 ml.	Av. colony count for 50 ml. broth	Estimated colonies: 10 cu. ft. bubbler pump	Air centrifuge: Colonies counted in 10 cu. ft.
Ward F ...	3	7	162	710	86
Ward E ...	6	14	318	1400	108
Ward H ...	3	5	137	610	58
Room 63 ..	3	5	137	610	170

S. M. WHEELER
G. E. FOLEY
T. DUCKETT JONES

COIN MATS FOR THE MICROSCOPIST

THE scarcity of supplies and the increase in cost of cover glasses suggest greater care in preserving those already on hand. It has been learned that much breakage can be avoided by the use of a rubber coin mat. Cover glasses and slides placed on these mats are easily grasped by the fingers without the necessity of pushing them to the edge of the table, where they frequently break from pressure in trying to pick them up, or fall to the floor. There is also a great saving on the finger nails and no risk of undernail splinters from rough tables. As a matter of fact, finger nails, long or short, cease to be a factor in handling the cover glasses. Ease in mounting specimens is sufficient reason for using the coin mat and the saving in breakage will soon amortize any expense involved.

The coin mats may be obtained from the Sun Rubber Company, Barberton, Ohio. Used whole, halved or quartered, they furnish a simple convenience to frustrate an ever-present source of impatience.

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BOOKS RECEIVED

DEXTER, LEWIS and SOMA WEISS. *Preeclamptic and Eclamptic Toxemia of Pregnancy.* Pp. xviii + 415. 44 figures. 3 plates. Little, Brown.

FENN, WALLACE O., Editor. *Muscle; Vol. III, Biological Symposia.* Pp. 370. Jaques Cattell Press, Lancaster, Pa. $3.50.

GILBERT, NORMAN E. *Electricity and Magnetism; Theory and Applications.* Second edition, revised. Pp. xvii + 585. 394 figures. Macmillan. $4.50.

MEYER, BERNARD S. and DONALD B. ANDERSON. *Laboratory Plant Physiology.* Second edition, revised. Illustrated. Van Nostrand. $2.00.

MILHAM, WILLIS I. *Time and Timekeepers.* Pp. xix + 616. 339 figures. Macmillan. $1.98.