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wit a similar fate. At any rate, Bocchoris died, and Mr. Wainwright calls the scene "the culminating horror of the Old Religion."

There are people alive in Egypt today who can remember seeing a play-acted form of Egypt's ancient, once tragic rite. For in small towns of Upper Egypt as recently as sixty years ago, the Coptic New Year was celebrat-

ed by having a villager in costume act as a mock king, Abu Nerez, father of the New Year. After three days of carnival, the dress of the mock-king was burned and from the ashes emerged a peasant farmer. And this, Mr. Wainwright concludes, was the last burlesqued remnant of Egypt's royal sacrifices.

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*Science News Letter, February 4, 1939*

### ENGINEERING

# Degree of Air Pollution Shown in Survey of Cities

## Home Fires Among Greatest Offenders, Especially In Regions Where Coal Has High Sulfur Content

**R**ESULTS of a fifteen-month survey of sulfur gases in the air in great metropolitan centers show that St. Louis is the worst American offender, according to the report of the Air Hygiene Foundation and the Mellon Institute, (*Science*, Jan. 20.)

In figures indicating the parts of sulfur dioxide per million parts of air, five metropolitan areas rate as follows:

	<i>Average</i>
St. Louis-East St. Louis .....	.128
Pittsburgh .....	.057
Detroit .....	.028
Philadelphia-Camden .....	.027
Washington .....	.009

The above figures have, however, no significance from a public health standpoint, according to hygienists connected with the investigation.

Over 50,000 separate air tests were made by six chemists travelling in a special fleet of laboratory cars, states John F. McMahon, executive secretary of the Foundation. These chemists canvassed industrial centers of the East, South and Midwest and made tests covering all hours of day and night and all seasons of the year.

Home fires, the survey showed, are among the greatest contributors to air pollution, particularly in districts burning coal of a high sulfur content. The home fuel factor explains why the sulfur pollution was about 50 per cent higher during the winter heating season than in summer.

A close relationship was found between wind velocity and sulfur dioxide in the

air. The higher the wind, the cleaner the air. Fogs catch and store up sulfur fumes, Mr. McMahon reports. Some of the highest concentrations were obtained on foggy nights.

Occasional tests were made in a score of other cities during the test but the results, the report warns, cannot be compared with those obtained in the more extensive studies. In these occasional tests Chicago showed a sulfur dioxide contamination of .067 parts per million; Wheeling, W. Va., showed .070; and Cleveland .064.

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### POPULATION

## Fathers Gain Attention From Population Experts

**F**ATHERS are usually ignored by statisticians calculating the future of the population just as the groom at a wedding is ignored by the society reporter.

The hope of a nation for perpetuating itself is usually figured on the basis of the rate at which mothers are succeeded by child-bearing daughters, the "net reproduction rate." This rate in recent years has been very low in Europe and America so that statisticians foresee a future in which the population no longer grows.

But fathers have their importance in these calculations, also. When it is desired to take account of the difference in reproduction rate between occupations or economic classes, then maternal reproduction rate is not enough, because no census gives details about the ages

of wives according to the occupations of their husbands.

The rate at which fathers are succeeded by sons of paternal age has been figured for Sweden and for England and Wales by Dr. Christopher Tietze, population expert. It is higher than the replacement rate of mothers for three reasons. The time separating father from son is greater than the length of a generation for women, husbands being usually a few years older than their wives. New-born boys outnumber new-born girls. And war losses and male emigration brought a feminine surplus to many European nations.

In Sweden, mothers produce only 69 per cent of the number of daughters required to replace them. Fathers produce 78 per cent of enough sons to take their places.

As far back as 1911, England's upper and middle classes, her lawyers, physicians, teachers, and clergymen were failing to replace themselves with sons. Paternity rates were highest for skilled workmen and miners. Textile workers, like the wealthy, had a paternity rate too low for eventual survival.

Why the difference between miners and textile workers? Dr. Tietze explains that the wives of miners are comparatively isolated. The wives of textile workers, often themselves employed, get out and talk with other women.

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## ● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association resulted in the location of the following provisional epicenter:

*Tuesday, January 24, 10:32.3 p.m., E.S.T.*

Slightly inland near the coast of Chile. Latitude 37 degrees south, longitude 72.5 degrees west.

Stations cooperating with Science Service in reporting earthquakes recorded on their seismographs are:

University of Alaska, College, Alaska; Apia Observatory, Apia, Western Samoa; University of California, Berkeley, Calif.; Des Moines Observatory, Des Moines, Iowa; Dominion Observatory, Ottawa; Dominion Meteorological Observatory, Victoria, B. C.; The Franklin Institute, Philadelphia; Harvard University Observatory, Harvard, Mass.; University of Hawaii, Honolulu; Hong Kong Observatory, Hong Kong, China; Magnetic Observatory of the Carnegie Institution of Washington, Huancayo, Peru; Massachusetts Institute of Technology, East Machias, Maine; University of Michigan, Ann Arbor, Mich.; Montana School of Mines, Butte, Mont.; Montana State College, Bozeman, Mont.; Pennsylvania State College, State College Pa.; Phu Lien Observatory, near Hanoi, French Indo-China; Seismological Observatory, Pasadena, Calif.; University of South Carolina, Columbia, S. C.; University of Vermont, Burlington, Vt.; U. S. Weather Bureau, University of Chicago; University of Wisconsin, Madison, Wis.; Zikawei Observatory, near Shanghai, China; observatories of the Jesuit Seismological Association at Canisius College, Buffalo, N. Y., Fordham University, New York City; Georgetown University, Washington, D. C.; St. Louis University, St. Louis; St. Xavier College, Cincinnati, and Weston College, Weston, Mass.; observatories of the U. S. Coast and Geodetic Survey at San Juan, P. R., Sitka, Alaska, Tucson, Ariz., and Ukiah, Calif.