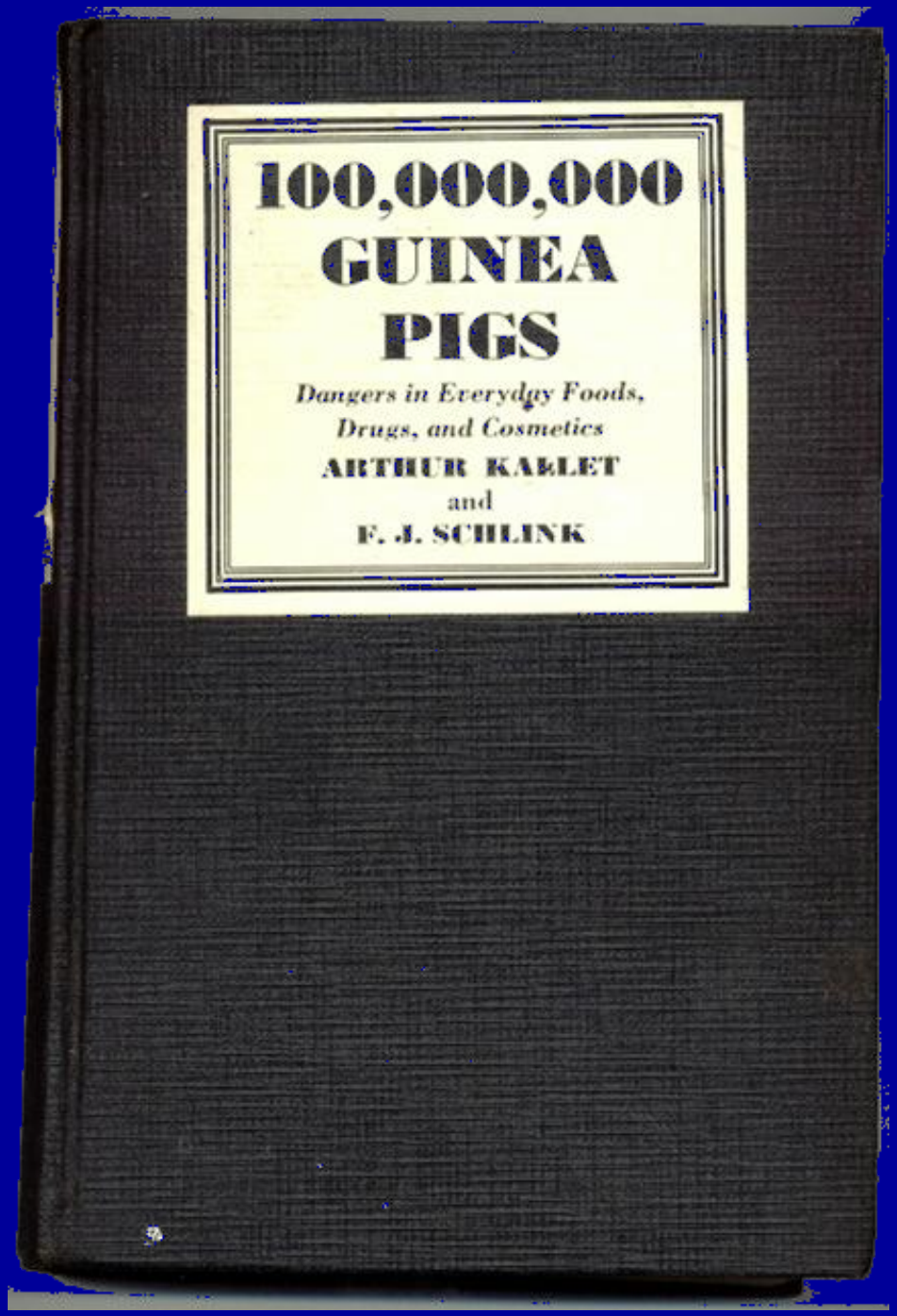

100,000,000
GUINEA
PIGS
Dangers in Everyday Foods,
Drugs, and Cosmetics
ARTHUR KALLET
and
F. J. SCHLINK

300,000,000

GUINEA PIGS

COPYRIGHT

1933

6,800,000,000

GUINEA PIGS

XENOBIOTIC

FOREIGN TO THE BODY

SOURCES

AIR

FOOD

WATER

SKIN CONTACT

GRAM = Standard unit of metric measure = >1/8 oz. = weight of a paper clip

1 milligram (mg) = 1/1000 gm = .001 gm

1 microgram (mcg) = 1/1,000,000 gm = 0.000 001 gm or .001 mg

1 nanogram (ng) = 1/1,000,000,000 gm = 0.0000 000 001 gm

1 picogram (pg) = 1/1,000,000,000,000 gm = 0.000 000 000 001 gm

1 mcg = 1 part per million (PPM)

1 ng = 1 part per billion (PPB)

1 pg = 1 part per trillion (PPT)

1 PPB = 1 drop of water evenly divided into 250 large chemical drums of approx 50 gal each

It is equal to 1 second in 31.7 years.

1 PPT = 1 drop of water divided into 20 Olympic swimming pools 2 meters deep

It is equal to 1 second in 31,700 years

PESTICIDES?

INSECTICIDES?

HERBICIDES?

BIOCIDES

ORGANOCHLORINES: DDT, DDE, DIELDRIN, CHLORDANE, ETC.

ORGANOPHOSPHATES: MALATHIONE, PARATHIONE, DIAZINON, ETC.

LIST

24 CATEGORIES OF PESTICIDES

INSECTICIDES

74 CLASSES AND SUBCLASSES AND

418 INDIVIDUAL COMPOUNDS AS OF 1/17/09

ORGANOCHLORINES

ORGANOPHOSPHATES

WHAT NEXT?

SYNTHETIC PYRETHROIDS

SYNTHETIC PYRETHROIDS

There are 54 individual agents

PYRETHRUM

Oleoresin of dried chrysanthemum flowers

PYRETHRINS

Pyrethrum derivatives: cinerin I, cinerin II, jasmolin I, jasmolin II, pyrethrin I, pyrethrin II

SYNTHETIC PYRETHROIDS

- 54 Compounds
- Laboratory manufacture
- Designed to be heat and light stable
- Much longer lasting than pyrethrins

HALF LIFE

The time required for one half of a substance to degrade

1st half life: 50% remains

2nd half life: 25% remains

3rd half life: 12.5% remains

4th half life: 6.25% remains

5th half life: 3.125% remains

- Half life 10 years: in 50 years the level will be down to 3% of the original concentration
- Half Life 20 years: it will take 100 years to reach 3%

OUTDOOR HALF LIFE

Pyrethroid half life out of doors and exposed to the elements can vary from 4 to 43 weeks depending on weather factors and which pyrethroid agent is used

INDOOR HALF LIFE

Much less information available

INDOOR HALF LIFE

The indoor half life of permethrin, one of the most commonly used pyrethroids, may be as long as 20 years

UBIQUITOUS USE

Household

Yard and garden

Public accommodations

Agriculture

ADHERENCE TO FABRICS

300,000,000
GUINEA PIGS

TOXICITY

ACUTE

CHRONIC

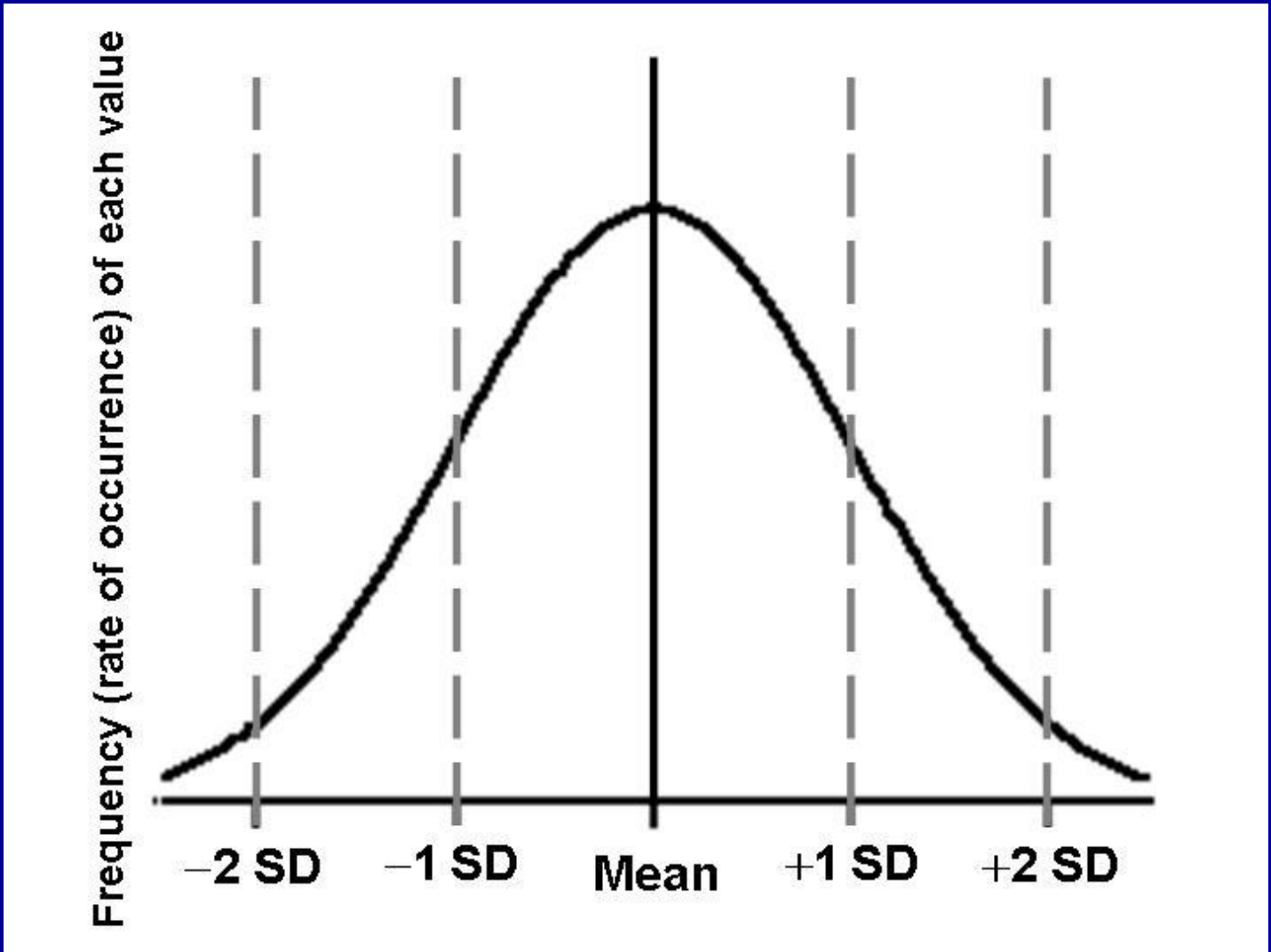
TOXICITY

Single heavy or massive exposure

vs.

Long term low level exposure

SUSCEPTIBILITY VS RESISTANCE



CHILDREN'S SUSCEPTIBILITY TO CHEMICALS

- World Health Organization Report July 2007
- Children are not just little adults

Over 30% of the global burden of disease in children can be attributed to environmental factors, including chemicals

The stage of a child's development when chemical exposure occurs may be just as important as the magnitude of the exposure

Pesticide exposure during key periods of development ties to neurobehavioral conditions and immunotoxicology, including Parkinson’s and respiratory disease

CRITICAL WINDOWS OF DEVELOPMENT

In utero

Breast feeding

Diet

Inhalation

Skin absorption

Behavior

Other physical factors

SYMPTOMS OF PYRETHROID TOXICITY

Nausea

Vomiting

Anorexia

Itching, tingling, burning of the skin

Skin irritation, rashes

Abnormal facial sensations

Increased stomach secretions

SYMPTOMS

- Irritated eyes
- Respiratory irritation
  - Burning of nasal passages, sniffing, sneezing
  - Tracheal and bronchial irritation
  - Asthma
- Immune suppression, decreased resistance to infection

SYMPTOMS

- Reduced testosterone levels and decreased sperm count in males
- Oral and gastrointestinal irritation
  - Tingling or burning of the lips
  - Burning of the tongue and oral mucosa
  - Heartburn

SYMPTOMS

- Neurological
  - Reduced intellectual performance
    - Reduction of endurance during mental work
  - Reduced exercise tolerance
  - Personality disorders
  - Visual disturbances
  - Ringing of the ears
  - Headache

SYMPTOMS

- Neurological, cont'd
  - Dizziness
  - Aggression
  - Hypersensitivity to external stimulation
  - Tremors
  - Convulsions
- Thyroid suppression
- Strong indication of cancer causing capability

CASE

“Cathy,” DOB 8/11/02

History of good health, except for tendency to catch colds and minor repiratory infections easily. Time missed from school.

Family get together at a beach rental on 7/6/08.

Generalized itching within 15 to 30 minutes

After 4 hours left and went to a motel.

Stayed in motel 2 nights. Worse morning of 7/7, so changed rooms. Sores inside bottom lip. Rash on face and upper torso.

Permethrin-tetramethrin fogger found in beach house.

Left for home on 7/8.

Heightened sensitivity to additional exposures:

- fragrances
- formaldehyde
- department stores (new textiles, plastics, etc.

- new carpets
- household cleaners

Restless sleep, wakes up during the night

Patches of dry skin

Shortness of breath on exercise. Level of physical activity diminished. No wheezing.

Accelerated weight gain

Possible food intolerances

Eight months later symptoms persist

Recent triggering of itching and stomachache from 2nd hand exposure to a pyrethroid flea control product.

PROGNOSIS?

Uncertain

CONCLUSION

WHAT DOES THE FUTURE HOLD?

For our children?

For ourselves?