

Pharmacy
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BIBLIOGRAPHY OF THE METHODS USED IN
DESTROYING RATS

BY
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SCHOOL OF PHARMACY

A Thesis Submitted for the Degree of
BACHELOR OF SCIENCE
(Pharmacy)

UNIVERSITY OF WISCONSIN

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Taylor, C.

1800

A Cheap and efficacious method for destroying rats and mice; recommends to the Agricultural Society of Manchester by the Secretary to the Society for Encouragements of Arts, Manufacture, and Commerce.

Phil. Mag., 8, p. 119

Recommends the use of oatmeal scented with oil of anise to which is added barium carbonate; gives a detailed method of using the poison.

(Editor)

1888

Rat Poison

Pharm. Era. 2, p. 325

Formula for a rat poison, containing strychnine and nitric acid is given.

(Editor)

1890

Rat Poison

Pharm. Era, 4, p. 311

Gives a formula for a rat poison containing 2 parts of squill and 3 parts of finely chopped bacon.

(Editor)

1892

Vermin and Insects Poisons

Pharm. Era. 17, p. 387

Gives several formulas for rat poisons, both pastes and powders, such as "Miller's Rat Poison" and "Rough-on - Rats".

(Editor)

1893

Spanish Rat Poison

Pharm. Era, 10 p. 156

A formula for Spanish Rat Poison is given:

Cantharides	100.0 Gm.
Brown sugar	100. Gm.
Musk	0.12Gm.
Oil rhodium	12. drops
Oil caraway	12. drops
Malt, ground	1000. Gm.

(Editor)

1893

Rat Poison

Pharm. Era. 10. p. 396

Gives the following formula as a rat poison:

Sulfur	8 parts
Warm water	180 parts
Barley meal	180 parts
Lard or bacon fat	120 parts
Sugar	20 parts
Oil of anise seed	1 part
Methyl blue	1 part

(Editor)

1895

A Novel Rat Poison

Pharm. Era, 13, p. 272

Illustrates a fraud in selling rat poison. In a demonstration to the public, rats were secretly electrocuted, but it was made to look as though they died from a substance which was fed to them. This substance was sold as poison, but in reality it was sugar of milk, which naturally attracted the rat.

Studies in the Art of Rat-catching, Popular ed.,
185 pp.

Reports on rat destruction under the following
headings:

I The Ferret Family - Crossed with the Polecat -
Choosing Ferrets - Hutches - Feeding Ferrets - Handling
Ferrets.

II Bag versus Box - Ferrets Fighting - The Ratting
Spade - Ratting Tools - Hints to Schoolmasters - Learning
Dog Language - With a Scold in the Voice - Dog's Kennel -
Treating Dogs Kindly - Dogs in the Proper Place.

III Aristocrat versus Plutocrat - Come by Chance -
Chance's Friend - Nondescript Tinker - Grindum - How I got
Grindum - Grindum's Friend - Jack and his Sister - "Jack
Took Me" - End of an Ugly Story - Grindum's First Rat -
Pepper and Wasp.

IV A Day's Ratting - An Autumn Walk - "Steady, Dogs,
Steady" - A Ferret Disabled - Rats up a Pollard - A Rat-
catcher's Picnic - Rats in a Drain - A Weary Walk Home -
"Kennel, Dogs, Kennel".

V A Poor Day's Ratting - A Rat in a Queer Place -
Rats in My Lady's Chamber - Rats in a House - Slaughter in
a cellar - Dead Rats in a House.

VI A November Day - A Laid-up Ferret - A Tramp Home
in the Wet - A Snug Evening - Things Students should Know -
Muzzling Ferrets - Sucking Blood - A Strange Use for a
Dog's Tail.

VII Rabbit Catching - Tools for Rabbit-catching -
Ferreting a Bank - A Deep Dig in the Sand - A Day with the
Purse Nets - Necessity of Silence - Ferrets Without Muzzles -
How to Kill Rabbits.

VIII Trip to the Seaside - Surveying the Hunting Grounds-
A View from the Cliffs - A Sea View - The Rector's Daughter -
Doctoring the Burrows - Running out Nets - "Hie in, Good Dogs."

IX The Beginning of a Storm - A Ship in Distress -
The Village Harbour - A Fisherman's Home - Little Jack, the
Cripple - Waiting for the Boats - A Rough Old Fish-wife -
The Return of the Fisherman.

X The Rector's Story - A Ship in Danger in Straight

on the Rocks - To the Rescue - Watching the Boat -
Breaking up of the Ship - Beyond the Storms of Life -
Life in the Little One - Nature's Gifts - What a
Hodge-Podge.

(Editor)

1896

Rat Poison

Pharm. Era, 16, p. 111

This formula for rat poison is given:

Old powder cheese	100 parts
Glycerin	20 parts
Barium carbonate	50 parts
Flour or corn meal	10 parts

(Editor)

1898

A New Rat Poison

Pharm. Era, 19, p. 14

A rat poison formula containing barium carbonate

(Editor)

1898

A Human Rat Trap

Pharm. Era, 19, p. 225

Advises using bells and phosphorescent paint on the
body of the rat.

Issatchenko, B.

1898

Ueber einem neuen für Ratten pathogenen Bacillus

Centralblatt f. Bakteriol. 1. Abt., 23, p. 873, (S. G. L.
index, S. 2, v. 14, p. 308)

Reports the various results obtained by the use of bacillus on rats and mice.

(Editor)

1899

Arsenic Poisons for Rats

Pharm. Era, 21, p. 646

Gives a formula containing arsenic as a rat poison.

(Editor)

1899

Rat Poison

Pharm. Era, 21, p. 406

Another rat poison formula is given-

Strychnine sulphate	1 dram
Sugar of milk	3 drams
Prussian blue	5 grains
Sugar	$\frac{1}{2}$ oz.
Oat flour	$\frac{1}{4}$ oz.

(Editor)

1899

Rat Poison

Pharm. Era, 21, p. 406

The following formula for a rat poison is given-

White arsenic	1 oz.
Ultramarine	10 gr.
Corn flour	$\frac{1}{2}$ oz.
Sugar	2 drams

Rat Poison

Pharm. Era, 21, p. 406

The following for rat poison is given-

Powdered squill	1 oz.
Barium carbonate	4 oz.
Oil of anise	5 drops

Spanish Rat Poison

Pharm. Era, 21, p. 406

The following formula is given-

Powdered Cantharides	1 oz.
Powdered Brown Sugar	1 oz.
Powdered Musk	1 gr.
Oil Rhodium	10 drops
Oil Caraway	10 drops
Malt flour	10 oz.

(Opatologo-anatonicheskikh izmieneniyakh, vizivayemikh v organakh mishei i kris mishe-i krisoubivayushtshimi batsillami. (Pathological alterations in the organs of rats and mice by bacilli that kill these animals))

Arch. vet. nauk, St. Petersburg., 29, 2 sect., p. 309,
(S. G. L. Index, S. 2. v. 14, p. 308)

The original was not available.

(De l'anhydride carbonique comme moyen de destruction des rats dans les cales des bateaux, surtout en temps d'épidémie de peste.)

Gaz. méd. d'Orient, Constant., 43, p. 134 (S. G. L. Index, S. 2, v. 14. p. 307)

The original was not available.

Apery, P.

1900-1901

(L'anhydride carbonique comme moyen de destruction des rats dans cales des bateau.)

Gaz. med. d'Orient, Constant., 43, p. 108, (S. G. L. Index, S. 2, v. 14, p. 307)

The original was not available.

Apery, P.

1900

(L'anhydride carbonique comme moyen de destruction des rats dans les cales des bateaux.)

Grece med., Syra, 2, p. 68, (S. G. L. Index, S. 2, v. 14, p. 307)

The original was not available.

Apery, P.

1900

(De l'emploi de l'anhydride carbonique CO₂ pour la destruction des rats dans les cales des navires et dans les caves, et de son action conservatrice sur les cadavres en général.)

Cong. internat. de med., comp. rend., sec. de med. nav. 1900, p. 48, (S. G. L. Index, S. 2, v. 14. p. 307)

The original was not available.

Chauvin, G.

1900-1901

(La destruction des rats a l'Institut Pasteur)

Scalpel, Liege, 53, p. 29, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Danysz, J.

1900

Un microbe pathogene pour les rats et son application a la destruction de ces animaux.

Annales del'institut Pasteur, v. 14, 1900, p. 193

Reports the isolation of other pathogenic bacilli soon after the bacillus typhi murium was discovered. Some species of bacilli are pathogenic to some species of rats and mice and other bacilli are pathogenic to still other species of rats and mice.

Danysz, J.

1900

(La destruction des rats par une maladie contagieuse.)

Rev. d'hyg., 22. p. 321, (S. G. L. Index, S.2, v. 14, p. 308)

The original was not available.

Danysz, J.

1900

Un microbe pathogene pour les rats (mus decurnanus et Mus rattus) et son application a la destruction de ces animaux.

Ann. de l'Inst. Pasteur, Par., 14. p. 193, (S. G. L. Index, S. 2, v. 14. p. 308)

Reports that a certain definite culture of bacillus cannot be used as a standard exterminator for all types of rats and mice in various localities and under various conditions; but, that each variety of rats and each variety of mice need a different culture of bacillus. Each particular infection or plague of rats is a case all of its own and a general application cannot be successfully applied.

Kinyoun, J.J.

1900

Report on the effects of the Danysz virus No. 2 as a destroyer of rats and mice.

Pub. Health Rep., U.S. Mar. Hosp. Serv., Wash., 25, p. 2959, (S. G. L. Index, S. 2, v, 14, p. 308)

Reports that the virus does the work of destroying rats very well. It completely "cleaned" a storehouse in 8 days.

Abel, R.

1901

Versuche uber die Verwundbarkeit des Bacillus Danysz zur Vertilgung von Ratten

Deutsche med. Wchnschr., 27, p. 869, (S. G. L. Index, S. 2, v. 14, p. 307)

Reports that 60 % of the rats were killed by the Danysz bacillus. The length of time required was 6-12 days.

Apery, P.

1901

Le Procédé Apéry Pour la Destruction des Rats

Technol. san., Louvain, 7, p. 319, (S. G. L. Index, S. 2, v. 14, p. 307)

Reports the use of carbonic acid for the destruction of rats. Gives a description of the generator of the gas and the mechanics employed in the application. Also reports on the use of sulfur dioxide gas for the same purpose.

Bronstein, J.

1901

(Zur Frage der Ratten vertilgung mittles des Danysz-bacillus)

Deutsche med. Wchnschr., 27, p. 577, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Cofer, L. E.

1901

A Rat Crusade in Honolulu

Pub. Health Rep., U.S. Mar. Hosp. Serv., Wash., 16, p. 2814, (S. G. L. Index, S. 2, v. 14, p. 308)

Reports seven points, in detail, governing the rat crusade in Honolulu. The methods are confined to traps, poisons, and sulfur fumigation. The rat-bounty method should not be used.

Extermination of Rats

Pharm. Era, 25, p. 638

Reports that Sulphurous acid gas was generated in the hold of a ship for the purpose of exterminating rats.

Kister, J. and Köttgen, P.

1901

Ueber die von Danysz gefundenen, für Ratten pathogenen Bazillen.

Deutsche med. Wehnschr., 27, p. 275, (S. G. L. Index, S. 2, v. 14, p. 308)

Reports that "Bazillen" had killed rats in from 7 - 12 days.

Klein, E. E.

1901-1902

The identity of the bacillus Gartner with the rat bacillus of Danysz.

Trans. Patholog. Soc. Lond., 43, p. 342, (S. G. L. Index, S. 2, v. 14, p. 308)

The writer differentiates between the activities of bacillus (enteritidis) of Gartner and the bacillus coli even though it is of the same family. Kelin proved by actual observation that both of these bacilli are in all respects identical with the exception of their derivation. He even reported that they were both of the same variety.

Klein, E. and Williams, H.

1901

Experiments with the Danysz rat bacillus

Lancet, 2, p. 440, (S. G. L. Index, S. 2, v. 14, p. 308)

Laboratory data on experiments with the rat bacillus (Danysz). The experiments were in an attempt to stop the bubonic plague which was being spread by rats. The writer differentiates between the bacillus Danysz and the typical bacilli coli communis.

Erfahrungen über den Bacillus Danysz

Deutsche med. Wehnschr., 27, p. 351, (S. G. L. Index, S. 2, v. 14, p. 308)

Reports different results than what had been previously reported with the Danysz bacillus, claiming that the death by this method requires more time, i.e., up to 20 days instead of up to 12 days.

Christoph., —.

1902-1903

(Destruction des rats par l'acide carbonique)

Gaz. med. d'Orient, Constant., 13, p. 116, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Currie, D. H.

1902-1903

(The common rat with suggestions as to the best method for its destruction)

California State Journ. Med., 1, p. 359, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Danysz, J.

1902

Destruction of Rats on Board Ship

Lancet, 1, p. 1801, (S. G. L. Index, S. 2, v. 14, p. 308)

Demonstrations at Cardiff of the Clayton apparatus for destroying rats on board ship and for disinfesting purposes. Sulfur dioxide gas was forced into the bottom of a vessel's hold which had a capacity of 200,000 cubic feet. The foul air was conveyed into a 600° F. furnace by means of pipe.

Rats in cages at the bottom of the hold died immediately. Those six feet below the surface of the deck died within 3 hours.

The bacteria ordinarily carried by rats was also killed.

Danysz, J.

1902

Destruction of Rats on Ship Board

Brit. Med. Jour., 1902, v. 1., p. 294, (S. G. L. Index, S. 2, v. 14, p. 308)

Reports that sulphur dioxide gas was used successfully without injuring the furnishings on the ship.

Grimm, M.

1902

Vergleichende Untersuchungen über den Bacillus Danysz und über einen neuen für Ratten pathogenen Mikroben.

Centralbl. f. Bakteriol, 1., Abt, 31, p. 286, (S. G. L. Index, S. 2, v. 14, p. 308)

Comparison of the Danysz bacillus and a new bacillus septicaeemiae n.s.

He claims results to be better with the new bacillus rather than with the Danysz from the uses of each, but neither are entirely satisfactory.

Grimm, M.

1902

Untersuchungen über einen neuen für Ratten pathogenen Mikroben

Centralbl. f. Bakteriol. Abt., 31, p. 459, (S. G. L. Index, S. 2, v. 14, p. 308)

Reports on the same type of work that Issatschenko was working on, namely the pathogenic microbe for the destruction of rats. He reports the same thing except that he wishes to stress the fact that the effect of this microbe on animals ordinarily around the barn, such as the ox, the swine, and the sheep. He says that the bacteria will not kill these domesticated animals, but does have a definite physiological effect, such as hard breathing, etc.

Issatschenko, B.

1902

Untersuchungen mit dem für Ratten pathogenen Bacillus
Centralbl. f. Bakteriologie, 1., Abt., 31, p. 26, (S. G. L.
Index, S. 2, v. 14, p. 308)

Record results on several animals including rats of
the effects of the Issatschenko bacillus.

Klein, E.

1902

On a microbe obtained from a dead rat, and resembling
the bacillus pestis.

Trans. Pathological Soc. Lond., 53, p. 412

A dead rat was forward for bacterioscopic analysis.
The rat was from a plague infested country. A microbe
was isolated from its lung by culture. It was again
proven that the bacillus from the dead rat was definitely
not bacillus pestis. There were some common characteristics
with Bacterium lactis aërogenes and in other respects
Bacillus coli communis.

Langlois, J. P. & Loir, A.

1902

La reistance des rats et des insectes a l'acide
carbonique et a l'acide sulfureux.

Compt. rend. Soc. de biologie, Par., 11 s., v. 4, p. 414,
(S. G. L. Index, S. 2, v. 14, p. 308)

Reports the relative effects of carbonic and sulfuric
acids in various strengths on rats and insects.

Morkl, G.

1902

Über die Bedeutung des Danysz'schen Bacillus bei der
Rattenvertilgung.

Centralbl. f. Bakteriologie, 1., Abt., 31, p. 202, (S.
G. L. Index, S. 2, v. 14, p. 308)

Using the Danysz bacillus results are no better than
if he had used any active poison.

Ringeling, H. G.

1902

(Iets over ratten - en maizenverdelging)

Tijdschr. v. sociale hyg. en openb. gezondheidsreg., Zwolle,
4, p. 53, (S. G. L. Index, S. 2, v. 2, p. 308)

The original was not available.

Staff, G. T. A.

1902

The destruction of rats on ships

Brit. Med. Journ., 1902, v. 2, p. 730, (S. G. L. Index,
S. 2, v. 14, p. 308)

Reports that tanks with holes in the top should be placed in the various holds of the ships. In the tanks would be placed fragments of marble. Then a system of piping should be arranged so as to supply these tanks with sulfuric acid from a central location. This process is used in the extermination of rats or in the extinguishing of a fire.

Strassner, ___.

1902

(Zur Frage der Rattenvertilgung)

Ztschr. f. Med. Beame, 15, p. 696, (S. G. L. Index, S.
2, v. 14, p. 308)

The original was not available.

Toyama, C.

1902

Über ein für Hausratten pathogenes Bakterium

Centralbl. f. Bakteriologie, 1, Abt., 33, p. 273, (S. G. L.
Index, S. 2, v. 14, p. 308)

Reports results on several animals besides rats with another pathogenic bacillum.

Wiener, E.

1902

(Über den Bazillus Danysz)

München. med. Wchnschr., 49, p. 401, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

1903

_____ , _____
(Versuche mit den Danysz'schen Rattenbacillen)

Oesterr. san.-Wes., Wien, 15, p. 165, (S. G. L. Index, S. 2., v. 14, p. 308)

The original was not available.

Batko, _____

1903

(Destruction des rats sur les navires; conseil
quarantenaire d'Egypte)

Rec. d. trav. Comit consult. d'hyg. pub. de France, Par.,
31, p. 513, (S. G. L. Index, S. 2, v. 14, p. 307)

The original was not available.

Cumming, H.S.

1903

Precautionary disinfection of vessels for purpose
of killing rats, etc., statements of steamship companies.

Pub. Health Rep., U.S. Hosp. Serv., Wash., 18, p. 1457,
(S. G. L. Index, S. 2. v. 14, p. 308)

Reports the inspection, holding, and fumigation of
plague-infested ships that docked at Hongkong and Kowloon.

Danysz, J.

1903

Destruction of rats in the port of Marseille

Pub. Health Rep. U.S. Mar. Hosp. Serv., Wash., 18, p. 755,
(S. G. L. Index, S. 2. v. 14, p. 308)

Special regulations prescribing careful surveillance during the discharge of cargo from suspected steamers and a special corps of ten persons were formed to carry out the instructions.

Granjux, __.

1903

La guerre aux rats

Caeducee, 3, p. 215, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Hossack, W. C.

1903

How to get Rid of Rats

Scientif. Am., 88, p. 379, (S. G. L. Index, S. 2, v. 14, p. 308)

Reports the use of ordinary slow-drying tar-varnish thinned with petroleum. This varnish is used by bedstead makers and japanners. The vermin loathe the smell of this mixture when it is poured into their runs and therefore leave the premises immediately.

Also suggests that a live rat can be dipped into such a mixture and then set free to drive the rest of the rats away.

Jacques, R.

1903

(Destruction des rats a bord des navires charges de marchandises, par la carbonification)

Rev. d'hyg., 25, p. 120, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Marin, P.

1903

(Destruction des rats a bord des navires charges)

Ann. d'hyg., 50, p. 385, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Merezhkovski, S. S.

1903

(O sudbie v Rossii i Yaponii batsilla, predlozhen-navo mnoyu dlya istrebleniya mishei (Fate in Russia and Japan of the bacillus proposed by me for the extermination of rats))

Arch. vet. nauk, St. Petersburg., 33, p. 825, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Oettinger, M.

1903

(Uber die Wiener'sche Methode zur Virulenzstugerung der Danysz-Bacillen)

München. med. Wehnschr., 1903, 50, p. 324, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

de Vaucloeroy, __.

1903

(Le rat migratorie; ses dangers; sa destruction.

Mauvement hyg., 19, p. 301, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Acosta, E.

1904

(Virus Danysz para la destruction de las rats)

Cron. med.-quir. de la Habana, 30, p. 55, (S. G. L. Index, S. 2, v. 14, p. 307)

The original was not available.

Bordas, F.

1904

Resistance des rats a l'intoxication arsenicale.

Compt. rend., 138, p. 836, (S. G. L. Index, S. 2, v. 14, p. 307)

Reports the physiological effects of arsenous acid, arsenites, and arsenates on rats.

Danysz, J.

1904

A microbe pathogenic to rats (*mus decumanus* and *mus ratus*) and its use in the destruction of these animals.

Brit. Med. Jour., 1904, 1, p. 947, (S. G. L. Index, S. 2, v. 14, p. 308)

Loeffler published the discovery of the bacillus *typhi murium*, which was isolated during an epidemic of spontaneous disease among white mice. Experiments showed that it is pathogenic only towards mice and field mice.

Eager, __.

1904

Rat extermination at Naples

Pub. Health Rep., U.S. Mar. Hosp. Serv., Wash., 19, p. 1634, (S. G. L. Index, S. 2, v. 14, p. 308)

The rats are drowned in a solution of sulphuric acid and then burned in a crematory. Those taken dead are examined and then burned.

de Lavarenne, E.

1904

(La destruction des rats migrateurs et des campagnols)

Presse med., Par., 1904, 1, p. 147, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Vainshtein, E. M.

1904

(Kvoprosu o znachenii bacil. Danysz'a v dielie uni-
chtozheniya kris (Importance of in the matter of
destruction of rats))

Vestnik obsh., hig., sudeb., i prakt. med., __, p. 1126,
(S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Bahr, L.

1905

Über die zur Vertilgung von Ratten und Mäusen be-
nutzten Bakterien.

Centralbl. f. Bakteriol., 1, Abt., 39, p. 263, (S. G. L.
Index, S. 2, v. 14, p. 307)

This is a compilation of results from various refer-
ences concerning the Danysz-Bacillus, the Issatschenko's
Bacillus, and Ratin.

Kolle, W.

1905

(Über Massnahmen und Verfahren zur Bekämpfung der
Ratten-und Mäuseplage.)

Arch. f. Schiffs - u. Tropen. Hyg., Leipz., 4, p. 289,
(S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Hossack, W. C.

1906

(Preliminary notes on the rats in Calcutta)

Indian med. Gaz., Calcutta, 41, p. 453, (S.G.L. Index, S. 2, v. 14, p. 308)

The original was not available.

Klein, E.

1906

(A new microbe, pathogenic for rodents, *Bacillus equi*.)

Vet. J., Lond., n.s., v. 13, p. 199, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Trautmann, H.

1906

Bakterien der Paratyphusgruppe als Rattenschädlinge und Rattenvertilger; zugleich ein Beitrag zur Differentialdiagnose der Rattenpest.

Ztschr. f. Hyg. u. Infektionskrankh., 54, p. 104, (S.G.L. Index, S. 2, v. 14, p. 308)

Bacteria of the paratyphus group was used in the experimentation with tame white rats, wild grey rats, and the white mouse.

This bacillus is not especially effective because only 45 % of the rats died after a complete feeding. The use of the bacillus has not been extensively continued comparatively.

R. ___

1907

(Nog iets over de cultures von ratten-en muizenverdelging)

Tijdschr. v. sociale hyg. (etc.) Zwolle, 9, p. 221, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Waldimiroff, A. & Kamensky, A.

1907

Versuche an Haustiern mit der rattentötenden Bakterie
Neumanns

Berl. tierarztl. Wochenschr., p. 25, (S. G. L. Index,
S. 2, v. 14, p. 308)

Raten is the commercial name for the Neumanns Bacteria. The above two men administered double rat doses of Neumann B. to domestic animals. No deaths resulted, but there was definite physiological activity.

Annett, H. E.

1908

Virus for the destruction of rats and mice

Brit. Med. Jour., 1908, 2, p. 1524, (S. G. L. Index, S.
2, v. 14, p. 307)

Liverpool virus bacillus were obtained originally from the intestinal contents of rats. Observations show that they are harmless inhabitants of the normal intestinal tract of man and animal, but occasionally take on pathogenic activity and properties which exhibit a large degree of specificity for the species from which the organisms were originally derived.

Aujeszký, A.

1908

(La legislazione danese in favore della distruzione
dei ratti)

Riv. d'igiene e sanita. pubblica., 19, p. 641,
(S. G. L. Index, S. 2, v. 14, p. 307)

The original was not available.

Barber, M. A.

1908

The rate of multiplication of *Bacillus coli* at different temperatures

Jour. Infectious Diseases, 5, p. 379.

Since *Bacilli coli* is used in the extermination of rats it is significantly interesting to realize that the rate of multiplication is extremely fast.

Browning-Smith, S.

1908

(Rat Destruction operations in Punjab)

Indian Med. Gazette, Calcutta, 43, p. 283, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

(Editor)

1908

(A possible future for cats)

Boston Med. & Surg. Journ., 159, p. 417, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Lantz, D. E.

1908

Method of Destroying rats

Pacific Med. Jour., 51, p. 421, (S. G. L. Index, S. 2, v. 14, p. 308)

Enumerates 5 points to be observed: poisons, traps, ferrets, fumigation, and rat proof construction of buildings.

It specifically recommends as poisons: barium carbonate, or barytes; also strychnine, a more virulent poison. 2 other poisons commonly used are arsenic and phosphorus, - usually contained in commercial preparations.

Lantz, D. E.

1908

Rat Exterminator

N. York Journ. of Med., 87, p. 759, (S. G. L. Index, S. 2, v. 14, p. 308)

Reports that in order to exterminate rats their natural enemy must be spared - hawks, owls, and skunks. Also recommends the rat-proof construction in buildings and a guillotine type trap. The best bait was "wienerwurst".

Ramachandrier, P. S.

1908

(Rat Destruction in India)

Med. Times and Gaz., 36, p. 919, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Reany, M. F. & Malcolmson, G. E.

1908

(Rat Destruction in Kamptie)

Indian Med. Gaz., Calcutta, 43, p. 338, (S. G. L. Index, S. 2, v. 14, p. 308)

The original was not available.

Shiple, A. E.

1908

(Rats and their animal parasites, pp. 23.)

The original was not available.

Wherry, W. B.

1908

Furthur notes on Rat Leprosy and on the fate of human and rat bacilli in flies

Jour. Infectious Diseases, 5, p. 507.

Report on the plague work in Oakland, Calif., attempting to determine leprosy in rats. There was no experimental evidence that rat leprosy and human leprosy were similar, therefore the 2 diseases are not ransferable.

Wherry, W. B.

1908

Experiments on the use of bacillus pestis-cavie as a rat virus

Jour. Infectious Diseases, 5, p. 519.

Experiments at the Federal Laboratory with a commercial ratticide known as Azoa, manufactured by Parke Davis & Co. who had asked for the trial experiment.

The rats died of an infection with B. pestis-cavie.

Xylander, ____,

1908

(Der Rattenbazillus als Rattenvertilgungsmittle)

Arb. aus dem Kaiserlichen Gesundheits Amte, 28, p. 145, (S. G. L. Index, S. 2, v. 14, p. 308)

Gives a table of results on about 200 various forms of the rat bacillus and its action on rats and mice

Stevenson, W. D. H.

1910

Preliminary report on the killing of rats and rat fleas by hydrocyanic gas

Scien. Mem. by Officers of the Med. & Sanitary Dept. of the Govern. of India

Experiments with hydrocyanic gas as a measure to

exterminate rats and fleas, were commenced in May, 1909. HCN was first used in 1896 by Coquiliet in California to destroy the "Cottony Cushion Scale" insect on plants.

The article also describes the production of the gas and methods of administration. Charts are also given to show results.

Rucker, W. C.

1912

(Necessity for Exterminating Rats)

Jour. Am. Med. Assoc., 59, p. 243, (Jour. A. Ph. A., 2, p. 645)

Emphasizes the necessity of exterminating rats especially in American Sea Ports and points out that the rodent in the 20th century anachronism. They are disastrous to all mankind.

_____ , ____ . 1913

Destruction of Rats, Insects, and other Vermin

Pub. Health Rep., No. 28, p.2391, Chapter 422 of the Act.

The government appropriation of \$100,000.00 to be spent in the prevention of Asiatic cholera, bubonic plague, etc by exterminating rodents from strategic places.

_____ , ____ . 1913

Rats, Extermination of

Pub. Health Rep., No. 28, p. 2062, of the Act Mar. 14, 1913, in Chapter 220.

Makes it unlawful to allow premises to become infested and remain infested with rats.

O., J. D.

1915

Destroying rats

Chem. & Drugg., 86, p. 754.

Reports the destruction of rats by various fumigation methods by means of such gases as carbon bisulfide, chlorine, carbon monoxide, sulphur dioxide, and hydrocyanic acid.

(Editor)

1916

To Depose Rats

Chem. & Drugg., 88, p. 1172.

Suggests the use of lead acetate and some farinaceous meal as a poison for rats.

Lereboullet, P.

1916

(La lutte les Rats des Tranchees)

Paris Medical, 6, p. 165, (U.S. Dept. Agr., Tech. Bull., No. 134, p. 36)

The original was not available.

(Editor)

1917

The Methods of the Rat Catcher

Chem. & Drugg., 89, p. 624.

Recommends preparing the bait in rat poison without touching with the hands and using roasted oatmeal, oil of anise, mixed with strychnine, arsenic, or carbonate or sulphate of barium.

(Editor)

1917

Rat-virus

Chem. & Drugg., 89, p. 504.

The town of Aberdeen, Scotland decided against the use of rat virus. A professional rat-catcher is to be employed instead.

(Editor)

1917

Rat-virus

Chem. & Drugg., 89, p. 912.

Favors the use of prepared rat-virus in preference to virus in tubes.

Lantz, D. E.

1917

House Rats and Mice

U. S. Dept. Agr. Farm. Bull., 896, 24 pp. (U.S. Dept. Agr. Tech. Bull., No. 134, p. 35)

A technical bulletin on rats and mice arranged under the following headings:

- Destructive habits
- Protection of food and other stores
 - Rat-proof buildings
 - Keeping food from rats and mice
- Destroying rats and mice

Traps

Poisons are listed as: barium carbonate, strychnine, arsenic, phosphorus, squills, chlorin, carbon monoxid, dioxid, and hydrocyanic acid; also rat viruses and lastly natural enemies such as the larger hawks, foxes, coyotes, weasels, minks, dogs, cats, and ferrets.

- Organized efforts to destroy rats
 - Community efforts
 - State and national aid
 - Important repressive measures
-

(Editor)

1918

An Excellent Bait for Rats

Chem. & Drugg., 90, p. 1019.

Discusses the use of dried sunflower-seed as a bait because rats eat it readily. The traps are used to catch the feeding rats.

(Editor)

1918

Rat Destruction

Chem. & Drugg., 90, p. 543.

Comments on the cost of the rat destruction plan in Scotland, where 100,00 rats were killed the first year, and that the plan would be continued.

(Editor)

1918

Rat virus

Chem. & Drugg., 90, p. 64.

Reports the amount of money spent on the free distribution of rat virus in Scotland and that further grants for the same purpose have been made.

Boulenger, E. G.

1919

Reports of the Methods of Rat Destruction

Zool. Soc. Lond. Proc., 244, (U.S. Dept. Agr., Tech. Bull., No. 134, p. 35)

Reports that an extract of the bulb of the red squill (*scilla maritima*), is the most effective, since it is deadly to rats and quite harmless to domestic animals in small quantities.

Also reports in detail the comparable effectiveness of the following rat poisons or the methods used in destroying rats: barium carbonate, virus, trapping, hunting with dogs and ferrets, gassing with hydrocyanic acid gas, carbon bisulfide, and sulfur dioxide; food material used in mixing with poisons; phosphorus, arsenic, strychnine, plaster of paris, magnesium sulfate, and croton.

Boulenger, E. G.

1919

Rat Destruction

Chem. & Drugg., 91. 1079.

The use of extract of squill is the most satisfactory poison for rats. Also recommends barium carbonate as a rat poison.

Strychnine, phosphorus, arsenic, plaster of paris, magnesium sulfate, and croton oil poisons were taken by rats only when no other food was available.

Although viruses are sometimes successful they are not reliable because rat populations may acquire toleration to them.

(Editor)

1919

Sulphur Dioxide for Rats

Chem. & Drugg., 91, p. 238.

Comments on the use of sulfur dioxide in the successful destruction of rats in the United States.

(Editor)

1919

Rat-catcher's Poison Allowance

Chem. & Drugg., 91, p. 640.

Additional sums of money have been allowed rat-catchers for poisons, traps, and other accessories.

(Editor)

1919

Campaign Against Rats

Chem. & Drugg., 91, p. 877.

The third reading of the rat bill in the house of Lords has been announced. It was decided to take steps to compile a directory of rat-catchers of repute and a list of approved methods of exterminating rats.

(Editor)

1919

"Rat Week"

Chem. & Drugg., 91, p. 1018.

Announces a "rat week" in Birmingham. Suggests tarring a rat and then letting it run loose. Carbon bisulfide, bromine, and chlorinated lime are discussed in the destruction of rats.

(Editor)

1919

Rat Destruction

Chem. & Drugg., 91, p. 1050.

Reports the organization of a campaign against rats. Requests chemists to instruct local committees as to the uses of rat poisons and rat virus and to lay in stocks of such necessary materials.

(Editor)

1919

Rat virus

Chem. & Drugg., 91, p. 1079.

Large quantities of rat virus have been purchased in Birmingham, England in connection with a special campaign against rats.

(Editor)

1919

Rat virus

Chem. & Drugg., 91, p. 1173.

The "Birmingham Post" states that £1,000 worth of virus has been purchased by the city for use in the rat campaign.

(Editor)

1919

The Sale of Rat-poison

Chem. & Drugg., 91, p. 1205.

Various farmers in Devonshire have requested that rural policeman be permitted to sell rat-poisons instead of just the chemists who had been duly authorized to sell them.

(Editor)

1919

Rat Poisons

Chem. & Drugg., 91, p. 1097.

Considerable success has been obtained with bacillary preparations and gases, the Danysz and the Liverpool viruses being outstanding. Among the successful gases are sulphurous acid and carbon monoxide.

States that Arsenic is probably the oldest of the poisons for rats. Recommends oil of rhodium, caraway, lavender, aniseed, and tincture of musk as a rat bait.

Also gives formulas for rat poisons with the following constituents as active ingredients: arsenic, strychnine, powdered nux vomica, barium carbonate, barium nitrate with sodium carbonate, phosphorus, carbon bisulfide, cantharides, and only 1 formula containing squill.

(Editor)

1919

Rat Quit

Chem. & Drugg., 91, p. 1276.

Discusses the commercial product "Rat Quit" as a successful rat destroyer. It contains a barium salt and is seemingly attractive to rats with a fatal dose that is quite small.

(Editor)

1919

"National Rat Week"

Chem. & Drugg., 91, p. 1145.

Announces the advice of the Board of Agriculture as to the danger involved in using strychnine, arsenic, and phosphorus as a rat poison, and that the red squill was very effective and quite safe. Another safe poison reported was barium carbonate. The Board refused to recommend any of the viruses.

(Editor)

1919

Rat Poisons

Chem. & Drugg., 91, 1174.

Comments on the successful use of barium carbonate as a rat poison. Although $1\frac{1}{2}$ to 2 gr. of barium carbonate is fatal to a rat, a cat or chicken can take from 10 to 15 gr. and dogs over 100 gr. without injury.

(Editor)

1919

Rats and Disinfectants

Chem. & Drugg., 91, p. 1214.

The Canadian Forestry Corps were tormented with a plague of rats, whereas a mile away at a military hospital not even a rat had been seen for 3 years. The immunity was attributed to the free use of "creosote substances" in the drainage system.

F., H. R.

1919

Non-poisonous Rat Poison

Chem. & Drugg., 91, p. 952.

Gives a formula for a rat poison containing powdered squill, liquorice, and oris.

H., G. W.

1919

Squill Rat Poison

Chem. & Drugg., 91, p. 776

Gives a rat squill rat posion formula. Efforts were made to trace the use of red squill as a rat poison by L. Pasteur.

(Editor)

1920

Varnish for Catching Rats

Chem. & Drugg., 92, p. 35.

Describes the use of a "strong lithographic varnish", warmed until it is sufficiently liquid to spread on cardboard, as a rat-catcher. The varnish is not poisonous.

(Editor)

1920

Campaign against Rats

Chem. & Drugg., 92, p. 67.

Comments on the Leeds campaign against rats, and the payment of a bounty of 2 d. for each rat tail presented.

(Editor)

1920

The Rats and Mice (Destruction) Act

Chem. & Drugg., 92, p. 83.

Explains the contents of the Act which requires the owner and occupiers of any land to take such steps as is necessary and practicable for the destruction of rats, also in preventing the premises from becoming invested with rats and mice.

(Editor)

1920

Fox Terrier

Chem. & Drugg., 92, p. 98.

Reports the killing of a rat in a store by an alert fox terrier.

(Editor)

1920

The Destruction of Rats

Chem. & Drugg., 92, p. 106.

Discusses the destruction of rats in a lengthy article under the following headings:

Powers of the Ministry of Agriculture,
Methods and Preventive Measures, and
Duties of Local Authorities.

Recommends the organization of a Rat Week, and rat-catchers. It also recommends "Rat Quit", red squill, and barium carbonate, as poisons.

(Editor)

1920

The Destruction of Rats

Chem. & Drugg., 92, p. 147.

Reports very methods and ingredients used in the destruction of rats. The active ingredients are : Arsenic, strychnine, phosphorus, barium carbonate, and red squill.

Recommends oil of anise, rhodium, and other essential oils as bait. Also emphasizes that the bare hands should not be used in preparing these baits.

(Editor)

1920

Destruction of Rats

Chem. & Drugg., 92, p. 220

Comments on opinions of a reader who manufactures rat virus who still is of the opinion that virus is the most effective and safest method for the destruction of rats.

(Editor)

1920

The Destruction of Rats

Chem. & Drugg., 92, p. 170

Discusses the destruction of rats in a lengthy article under the following headings:

Fumigation by carbon bisulfide, Trapping, Virus, and Deodorants.

(Editor)

1920

Rats and Mice (Destruction) Act

Chem. & Drugg., 92, p. 841.

Explains the enforcement of the Act and the requiring of the posting of the names of Pharmacists who have approved poisons for sale.

(Editor)

1920

The Supply of Rat Poisons

Chem. & Drugg., 92, p. 838.

Calls attention to the variability in the supply of rat poisons in Devon County, England.

(Editor)

1920

Rat Poison

Che., & Drugg., 92, p. 776.

Gives a formula for a rat poison containing arsenic and oil of anise in biscuits.

(Editor)

1920

Rat Quit

Chem. & Drugg., 92, p. 78.

Recommends that chemists take up the sale of rat poisons to obviate the necessity of the public authorities selling these products. Also reports that "Rat Quit" has been enjoying a boon in sales at present.

(Editor)

1920

"Rat Quit"

Chem. & Drugg., 92, p. 212.

Announces the approval of "Rat Quit" by the South-end-on-Sea Association of Pharmacists. It was recommended that member stock this article.

(Editor)

1920

Ratox Rat Posion

Chem. & Drugg., 92, p. 174.

Announces the advertisement of "Ratax Rat Poison".

(Editor)

1920

Rat Destruction

Chem. & Drugg., 93, p. 1107.

States that a considerable decrease in rat population has resulted since the Ministry of Agriculture assumed responsibility for supervising measures for the destruction of rats. Part of the program was personal instruction, issuance of pamphlets, notices, and calling attention to the waste of food and damage to property by rats.

(Editor)

1920

Destruction of Rats

Chem. & Drugg., 94, p. 1217.

Reports the use of large quantities of red squill by the Ministry of Agriculture and Fisheries in an attempt to exterminate the rats at Kew Gardens, London.

(Editor)

1920

National Rat Week

Chem. & Drugg., 94, p. 1453.

Discusses the use of fumigators and poisons, which can be obtained from chemists or from the Public Health Department, for National Rat Week.

(Editor)

1920

Accidental Poisoning of Dogs

Chem. & Drugg., 94, p. 1584 .

Reports the accidental poisoning of a considerable number of dogs due to the extensive use of barium carbonate in rat poisons exposed on a large scale.

Gunn, J. A. & Heathcote, R. St. A.

1920

The Alleged Hypersusceptibility of the Rat to Squill

Journ. Physiol. 54, p. 85, (U.S. Dept. Agr., Tech. Bull., No. 134, p. 35.

Reports that the rat is more sensitive to squill than other laboratory animals; also that rats show a high degree of tolerance to other glucosides of the digitalis group of which squill is a member. Requires the use of 30 times as much strophanthus to arrest the rat's heart in the same time as it did that of the rabbit's heart, but with squill it works just the opposite.

Schwartz, E. W.

1920

Toxicity of barium carbonate to rats

U.S. Dept. of Agriculture, Bureau Chem., Bull. 915, p. 1,
(Document Catalog., v. 15, 1919-1921)

Reports on the toxicity of barium carbonate to rats
under the following headings:

Purpose of Investigation
Previous Investigations
Experimental Procedure
Results of Experimental Work
Minimum Efficient Concentration of Barium Carbonate
Results of other Experimental Work on Barium
Toxicity of Barium Carbonate to Animals other than
rats
Conclusions
Bibliography

Claremont, C. L.

1921

National Research on Rat Destruction

Journ. Roy. Sanit. Inst., 42, p. 311, (U.S. Dept. Agr.,
Tech. Bull., No. 134, p. 35)

Reports the organization of the National Research on
Rat Destruction. This committee recommends red squill with
a minimum lethal dose of $\frac{1}{2}$ gr. for $\frac{1}{2}$ pound rat, or barium
carbonate with a dose of 2 gr. for a $\frac{1}{2}$ pound rat.

Vehicles are recommended.

Virus is recommended.

Pathogenic fungi are recommended.

Such gases as: chlorine, phosgene, sulfur-dioxide,
hydrocyanic acid, and carbon bisulfide are recommended.

Dalton, W. H.

1921

An Aspect of Rat Prevention

Journ. Roy. Sanit. Inst., 42, p. 418.

Recommends concrete bases, walls, and sheet iron, in in the concrete bases, for buildings, intellignet supervision in feeding of stock, preventing easy access to graneries and stores of meal in bins; and lastly refuse.

(Editor)

1921

Cost of Rat Killing

Chem. & Drugg., 94, p. 422.

Reports good results in reducing rat infestation, the decrease being brought about by the Rats and Mice (Destruction) Act and that a large sum of money and many people are being employed in the project.

(Editor)

1921

Rat Destruction Statistics

Chem. & Drugg., 94, p. 235.

Reports the vast destruction of rats, the amount of money spent, and the relative success of virus compared to other poisons.

(Editor)

1921

Toxicity of Barium Carbonate to Rats

Chem. & Drugg., 95, p. 212.

Reports the lethal doses of barium carbonate and barium chloride for rats.

(Editor)

1921

Rat Viruses

Chem. & Drugg., 95, p. 785.

Reports the results of an investigation of the advisability of using rat viruses and recommended that all shipping be subjected to a semi-annual rat clearance.

F., H. B.

1921

Rat and Mouse paste free of scheduled poisons

Chem. & Drugg., 95, p. 64.

Gives a formula for a rat poison containing barium carbonate, biscuit meal, and oil of mustard.

Moore, A. E.

1921

Vermin Repression

Journ. Roy. Sanit. Inst., 42., p. 319.

Emphasizes the necessity for rat destruction and reports the attempted legislation for compulsory rat extermination during the World War.

Schlupp, W. F.

1921

(The destruction of Rodents by the use of Poisons)

Union So. Africa Dept. Agr. Bull., 4, 34 pp., (U.S. Dept. Agr., Tech. Bull., No. 134; p. 36)

The original was not available.

Smith, F. W.

1921

Liquid Extract of Red Squill (*Scilla Maritima*) as a rat poison.

Analyst, 46, p. 178, (Analyst, 47, p. 61; U.S. Dept. Agr. Tech. Bull., No. 134, p. 35)

Reports on the use of liquid extract of red squill as a rat poison and the difficulty in distinguishing it from white squill. Reports the preparation methods, the properties, and preservation of the extract of red squill.

Claremont, C. L.

1922

Notes on the analysis and use of Red Squill in Rat Poisons

Analyst, 47, p. 60, (U.S. Dept. Agr. Tech. Bull., No. 134, p. 35)

Reports on the analysis of red squill, giving 7 tables of detailed information as to the chemical constituents and chemical properties.

(Editor)

1922

Rat viruses

Chem. & Drugg., 96, p. 805.

Reports experimental results obtained from an investigation of the toxicity of various viruses for rats.

(Editor)

1922

Attracting Rats

Chem. & Drugg., 96, p. 372.

Reports the use of the odors of anise, caraway and rhodium oils as helpful in attracting rats, but it is not thought that the odors are irresistible.

(Editor)

1922

Chlorine Gas

Chem. & Drugg., 96, p. 770.

Reports the use of chlorine gas in experimenating rats, especially successful in the open where the rats cannot reach a higher level than the heavy gas is able to go.

(Editor)

1922

Agriculture Research

Chem. & Drugg., 96, p. 203.

Reports the discontinuance of the research laboratory and rat bait factory because of the present need for existing national economy. The establishment had been carrying on research and the manufacture of rat bait free of charge to those desiring the poisons.

(Editor)

1922

Rat Week

Chem. & Drugg., p. 343.

Reports another "Rat Week" to take place in Scotland.

(Editor)

Rat virus causes death.

Chem. & Drugg., p. 422.

Reports the accidental death of a woman who ate chicken broth that was contaminated with a rat virus.

(Editor)

1922

"Rat Week"

Chem. & Drugg., 97, p. 624.

Reports that another "rat week" is to be held throughout Scotland.

(Editor)

1922

Rat Destruction

Chem. & Drugg., 97, p. 519.

The Ministry of Agriculture and Fisheries has issued various suggestions for the destruction of rats during "rat week". Suggestions included the use of red squill, barium carbonate, phosphorus, sulphur dioxide, and calcium carbide with water.

(Editor)

1922

Rat week

Chem. & Drugg., 97, p. 654.

The medical officers of health warns citizens against the indiscriminate use of poisons during "rat week".

(Editor)

1922

A Statistical Curiosity

Chem. & Drugg., 97, p. 111.

Reports that rats are costing the Irish Nation £42 a minute for food.

(Editor)

1922

Ratsticker

Chem. & Drugg., 96, p. 354.

Reports the introduction of "Ratsticker", the non-poisonous varnish for trapping rats.

(Editor)

1923

(The destruction of Rats (Grt. Brit.))

Gr. Brit. Ministry Agr. & Fisheries Leaflet, No. 244, 8 pp., (U.S. Dept. Agr., Tech. Bull., No. 134, p. 35)

The original was not available.

Dujardin, __. & Beaumetz, __.

1923

Rat Extermination by virus.

Chem. & Drugg., 99, p. 571.

States that if the virus is well prepared and used under favorable conditions success is undeniable, but failure is doubly dangerous because a weakened culture will not only fail to kill but it will confer on the rats an effective and permanent immunity against further doses of the viruses.

Dujardin, __. & Beaumetz, __.

1923

La deratisation

Journ. de Pharm. et de Chim., S. 7, v. 27, pp. 461 & 502; v. 28, p. 17, (U.S. Dept. Agr. Tech. Bull., No. 134, p. 35)

Classifies Rats and Mice. Recommends the use of the cholera microbe, bacilli paratyphique, (le bacillus typhi murium); it also recommends: arsenic, strychnine, phosphorus, barium carbonate, squill, gas asphixiation, acetylene, carbon disulfide, and sulfuric acid.

He also recommends direct capture with a bounty on head of each rat.

(Editor)

1923

Vermin Destroyer

Chem. & Drugg., 99, p. 406.

Suggests the use of barium carbonate salts for destroying rodents and refers to United States Department of Agriculture Bulletins. Also discusses in detail the toxicity of barium salts and strychnine.

(Editor)

1923

Rat Poisons and Rat Varnishes

Chem. & Drugg., 98, p. 744.

Strychnine, arsenic, and phosphorus are discouraged owing to the danger attached to their use. Suggests that barium carbonate is not worthy of the prominent position that it occupies. Also states that all varnishes are not of equal tackiness.

(Editor)

1923

Barium Carbonate as a Rat Poison

Pharm. Era, 56, p. 203.

The United States and the New York City Public Health services recommends the use of barium carbonate in certain proportions with various other ingredients as a poison for rats.

Fantus, B. & Hektoen, L.

1923

Saccharin Feeding of Rats

Jour. A. Ph. A., 12, p. 319.

Feeding saccharin to rats in even relatively enormous doses, and for a life time of these animals, does not produce lesions appreciable either macroscopically or microscopically, nor does it interfere with the development of these animals or of their progeny, or shorten their span of life.

J., S.

1923

Red Squill and Barium Rat Pastes

Chem. & Drugg., 98, p. 858.

Recommends a rat poison consisting of red squill, barium carbonate, meal, and beef drippings.

Monier-Williams, G. W.

1923

The use of Hydrocyanic gas for the Fumigation of Ships.

Chem. & Drugg., 99, p. 645 .

The primary object of fumigating ships is to kill rats and to prevent the spread of plague. Hitherto sulfur dioxide was used, but due to the damage done to furniture the hydrocyanic acid has replaced hydrogen cyanide. A very detailed report is given concerning the methods used in fumigating ships.

T., V. L.

1923

Rat Poisoning

Chem. & Drugg., 98, p. 212.

Reports that artificial barium carbonate is generally preferred to witherite for rat poisoning. Also recommends liquid extract of squill as a rat poison.

(Editor)

1924

(Directions for using barium carbonate for poisoning rats)

Biological Survey Bureau, Document Catalogue, 17, 1923-5, P. ____.

The original was not available.

(Editor)

1924

Rat Poison Content

Chem. & Drugg., 100, p. 214.

Advices the necessity of knowing what is in a rat poison because if it contains arsenic the poison may only be sold by a registered chemist.

(Editor)

1924

An Electric Rat Destroyer

Chem. & Drugg., 100, p. 529.

A patent (No. 211,683) has been granted for an electric rat-catcher, designed to electrocute rodents.

(Editor)

1924

Destuction of Rats

Chem. & Drugg., 101, p. 354.

Complete success has attended the experiments in the destruction of rats by means of calcium cyanide.

(Editor)

1924

Expensive Poisoning

Chem. & Drugg., 101, p. 480.

Reports that 1,727 dead rats were killed at an average cost of 2s. 4½ d. each in the south-west London borough of Battersea.

(Editor)

1924

Fashion in Rat Poison

Chem. & Drugg., 101, p. 702.

Reports that during the year's "rat week" red squill is the most popular poison used and that phosphorus preparations are not so much in vogue. The gases experimented with included: chlorine, phosgene, sulphur dioxide, hydrocyanic acid, and carbon disulfide.

(Editor)

1924

Rat Poisons

Chem. & Drugg., 101, p. 660.

Gives a formula for a rat poison containing red squill, meal, barium carbonate, and beef drippings.

Hovell, M.

1924

Rats and How to Destroy Them

A book of 465 pages on destroying rats, arranged under the following headings:

The habits of Rats, Traps, Signals, Trapping, Snaring, Ferrets, Mongoose, Ferreting, Dogs, Trailing, Poisoning, Virus, Blocking, Flooding, Fumigation, Varnish and Rat-lime Trap, The Rodier System, and Rats in the house, shop, Warehouse, etc., Rats in the outbuildings, Rats in the Yard, Rats in the Stable, Rats in the cowhouse, Rats in the Fowl house, Rats in the pig-sty, Rats in the Garden, Green house, and Vinery; Rats by the rivers, streams, ornamental water; Rats on a Ship, Rats on a Shooting Estate and on a farm; Rats in a Sewer; Some Notes on Plague, Some Notes on Cancer; Cockroaches, Mice, Sparrows, Conclusion and Recapitulation; Appendix; Scheme for Organized Destruction.

Also gives reference to the following commercial preparations: "Klearwell", Red Squill Rat Baits; "Terrier", Death Run Rat Trap; The "Wonder" Rat Trap; The Colin Pullinger Mouse and vole trap; The "Londovus" Way, Londovus Limited; Magic Paste, Charles Penny; W. & G. Sidebotham Rat Trap; "Ratsticker", B. Winstone & Sons, Ltd.; "Rodine" Rat Poison, T. Harley; Rat Catching Varnish, Dane & Co.; "Ratinol", The Ratinol Co., Ltd.; "Momorats", W. Bredt;

"Ratmousine", F. Farmer & Co.; "Dak", Kay Bros., Ltd.

(California Health Report)

1925

Bar on Bacteriological Rat Exterminators

Journ. A. Ph. A. 14, p. 1068.

Has forbidden the sale of bacterial rat exterminators in the State of California. Experiments show no great efficiency in these products, but have determined that their use may lead to the production of a chronic carrier state in rodents with bacteria known to cause poisoning in human food.

Donaldson, H. H.

1925

Control of Rat Population

Science, 61, p. 305.

Reports the probable size of the rat population. Rats increase in number in proportion to the amount of food available and that a partial extermination of a certain horde of rats makes more food available to those remaining and consequently their increase is expedited.

(Editor)

1925

\$2,800,000.00 for Rat Killing

Chem. & Drugg., 102, p. 634.

Reports that more than 2 million dollars is expended annually in the United States for rat control. A Compilation by the Department of Agriculture indicated that \$1,380,000.00 is spent for chemical poisons, while bacterial rat viruses account for about \$500,000.00.

(Editor)

1925

Phosphorus Rat and Mouse Paste

Chem. & Drugg., 103, p. 454.

Gives a rat poison formula containing phosphorus, beef dripping, and warm water to be mixed with biscuit meal, meat extract, and more water. Also states that squill is poisonous to mice and rats as they are especially susceptible to scillitoxin.

(Editor)

1925

Getting Rid of Rats

Pharm. Era, 60, p. 87.

Gives recommendations of the government as to methods and formulas in destroying rats, which are responsible for tremendous amounts of devastation.

Fruchter, M.

1926

Rats

Poet Lore, p. 154.

A one-act play is given illustrating the presence of rats and the conditions existing in this circumstance.

Rat Control

U.S. Dept. of Agr., Farm. Bull., No. 1533, Revised June 1930, Revised Apr. 1933.

Discusses- Permanent exclusions of rats, destruction of rats, community cooperation in rat control, and anti-rat legislation.

Suggests the use of barium carbonate (precipitated), a heavy white mineral salt, mildly poisonous, tasteless, odorless, slow in action, and inexpensive, all of which characterize and contribute to its value as a rat poison.

Red squill is also recommended. Other poisons that have been used, according to this report are: phosphorus, arsenic, strychnine, and thallium. These last ones are commonly used in commercial rat poisons. Arsenic is used in the form of an oxide, and the thallium is used in the form of a sulphate.

Calcium cyanide dust is recommended for use in the harbors. Exhaust gases from gasoline engines are used for funigating rat burrows. Carbon disulfide, sulfur dioxide, acetylene, and chlorine are also successful when properly applied.

Some Chemical and Physical Properties of the Rat-poisoning Substances in Red Squill

Journ. Pharmacol. & Expt. Ther., 31, p. 132, (U.S. Dept. of Agr., Tech. Bull., No. 134, p. 36)

Reports on the toxicity of red squill after it has been subjected to various physical and chemical changes. Also reports limitation in the preservation of red squill.

Winton, F. R.

1927

The Influence of Fineness of Division upon the Effective Toxicity of Squill Powder Eaten by Rats

Journ. Pharmacol. & Expt. Ther., 31, p. 131, (U.S. Dept. Agr., Tech. Bull. No. 134, p. 36)

Reports in detail by means of tables the influence of fineness of division of powder upon the effective toxicity of red squill.

Winton, F. R.

1927

The Quantitative Estimation of the Rat-poisoning Substances in Red Squill

Journ. Pharmacol. & Expt. Ther., 31, p. 124, (U.S. Dept. Agr., Tech., Bull., No. 134, p. 36)

Reports in detail by means of equations and tables the quantity of Red Squill necessary for certain specified effects.

Winton, F. R.

1927

The Rat-poisoning Substance in Red Squills

Journ. Pharmacol. & Expt. Ther., 31, p. 123, (U.S. Dept. Agr., Tech. Bull., No. 134, p. 36; Chem. & Drugg., 107, p. 818)

Reports on the use of red squill for poisoning rats, but not white squill. Recalls that confusion in properties of red squill poison with that of the cardiac glucoside. Death occurs after 2 days of posterior paralysis, general paralysis and finally periodic convulsions.

The poison is reported to effect the stomach, kidneys, and especially the lungs, but it does not effect the heart.

Female rats succumb to doses of red squills, only one-half as great as those needed to kill males.

Eaton, P. & Stirrett, C. S.

1928

Reproduction rate in wild rats

Science, 67, p. 555.

A survey was conducted in 1922 by the Board of Health in New Dedford, Mass. by collecting 6,000 rats from the business portion of the city and also along the water front. 7% of the female rats examined were found to be pregnant.

(Editor)

1928

A Small Result

Chem. & Drugg., 109, p. 486.

The Borough Council laid down 14,062 poison baits, about 4,000 traps, and employed dogs and cats in a campaign to exterminate rats, but the total "bag" for the past months only amounted to 1,840 rats, and 60 mice.

G., J.

1928

Red Squill Rat Poison

Chem. & Drugg., 109, p. 592.

Gives a formula for a rat poison containing red squill, barium carbonate, meal, and beef dripping.

(Editor)

1929

Rat Destruction

Chem. & Drugg., 110, p. 671.

Comments on the success of the Rat and Mice (Destruction) Act, 1919 and the success of organization of "rat weeks". Suggests the use of bacillary poisons for rats. Among the favorite chemical poisons are barium carbonate, phosphorus, arsenic, and tartar emetic. Squill is also recommended.

Rat baiting is facilitated by means of fennel, caraway, anise or lavender oil.

A detailed description of the "Act" is given.

(Editor)

1929

Rat-Week Discussion

Chem. & Drugg., 111, p. 693.

Reports that the demand for rat destroyers was quadrupled during a recent rat week.

Hogarth, A. M.

1929

The Rat : A World Menace

Bull. Imp. Inst., 27, p. 536.

The rat problem presents itself in so many different ways that there can be no "standard practice" in dealing with it.

Hogarth, A. M.

1929

The Rat, A World Menace. London

Reports on the destruction of rats in the following chapters (112 pages):

I History of the Rat. Its geographical distribution. Species of the Rats, Voles, and Mice. Description of same. The domestic Mouse and how to deal with it.

II Habits of the Rat and its Fecundity

III Waste of Food and Damage caused by the Rat

IV The Rat as a carrier of Disease and a Menace to health.

V Natural enemies of the rat
The Rodier System

VI How to Kill Rats - Stopping

VII Flooding and Smoking

VIII Ferreting

IX Trapping

X Poisons

XI Bacterial Cultures

XII Rats in Shops, Factories, Warehouses, and Dwellings

XIII Rats on the Estate, Farm, and in Outbuildings

XIV Rats in Sewers

XV Rats on Board Ships

XVI Suggested Measures

XVII Deratization

In the beginning of this report the following commercial preparations are listed:

Ratkilla, a litho varnish preparation by John Kidd & Co.

"Zelio" Paste - Bayer Products Ltd.

British Rat System Co.

Liverpool Virus - Evans Sons Lischer & Webb. Ltd.

Rodine - T. Harley, Rodine Works

Gilpa Rat Trap - Gilbertson & Page, Ltd.

"Ferry" Destroyer, - The Briton Ferry Chemical and Manure Co., Ltd.

The Nipper Rat Trap - England

Cyanogas - Geog. Monro, Ltd.

Dak Ratline - Kay Brothers

Rat Catching Varnish - Dane & Co.

Llyod's Rat Exterminator - Llyod's Chem. Co.

Silver, J.

1929

Rat Control aided by Development of Effective New Poisons.

The Yearbook, U.S. Dept. Agr., Tech. Bull., No. 134, p. 36.

Reports the use of rat poisons that were (according to this article) practically unknown in this country 5 years ago, but have now come into wide use. These are red squill, thallium sulfate, and calcium cyanide.

Detailed properties of each are give.

Wardle, R. A.

1929

Vermin Repression

The Principles of Applied Zoology, 1 ed., p. 231.

Reports the methods of destruction of rats by means of poisons which are both the cheapest and the most expensive. Posions that are recommended are strychnine, coated wheat or barley, arsenic, potassium cyanide, barium carbonate, squills, and phosphorus.

Fumigation is carried out by poisonous gas such as the volatile liquid, carbon bisulfide. For fumigating ships the Clayton process is recommended. This consists of forcing sulfur dioxide into the space to be dienfected. Also recommends a mixture of carbon dioxide and carbon monoxide.

Also reports on the use of the Harker apparatus which delivers 180,000 cubic feet of waste furnace gas per hour. Finally reports on the use of hydrocyanic gas as a ship fumigant to destroy rats.

Also discusses various methods of trapping rats.

(Editor)

1930

Red Squill Powder as Raticide

Chem. & Drugg., 113, p. 392

Reports the use of and the method of preparation of toxic red squill powder.

(Editor)

1930

Rat Pest

Chem. & Drugg., 112, p. 146 .

Suggests the use of artificial ferrets which are made by saturating cotton wool with a strong solution of potassium or sodium nitrate, treated with pulverized capsicum. They are made into cylinders and are then tied at intervals. The end of one of these are lighted and placed in the run with a sod of earth to cover the entrance, so that the fumes travel inward.

Silver, J. & Crouch, W. E.

1930

Rat Proofing Buildings and Premises

U.S. Dept. Agr., Farmer's Bull., No. 1638.

Reports various methods of construction, and reconstructing buildings in order to render them rat proof.

(Editor)

1931

Rat Poisons

Chem. & Drugg., 114, p. 320.

Gives the formulas for 2 rat poisons, the active ingredient of each is red squill.

(Editor)

1931

National Rat Week

Chem. & Drugg., 115, p. 536.

The ministry of Agriculture and Fisheries has arranged for this year's "rat week". The methods employed in the destruction of rats are grouped under 4 heads, and discussed separately: hunting, trapping, poisoning, and gassing. Ferrets are recommended for hunting; spring, wire, and snare traps for trapping; barium carbonate and squill for poisoning; and carbon disulfide and hydrocyanic acid for fumigating. Also recommends chloride of zinc as a deodorizer for inaccessible dead rats.

Gilhousen, H. C.

1931

An Investigation of "Insight" in Rats

Science, 73, p. 711

Experiments were conducted to get further information on the existence of "insight" in rats. The experiments were carried out by mechanically constructing an easy and a difficult path to certain points and after that, the round-a-bout way.

(Editor)

1932

Rattoscine, Ltd.

Chem. & Drugg., 117, p. 635.

Announces a new company, Rattoscine, Ltd. which will manufacture preparations for extermination of rats and other rodents.

Barron, D. H.

1933

Some Factors Influencing the Susceptibility of Albino Rats to Injections of Sodium Amytal

Science, 77, p. 372.

A 10 % solution of amytal was used to produce anesthesia in male animals. The weight of the animals. The weight of the animal and castration produces a marked effect in the comparative results of the amytal.

F., J.

1933

Rat Poison

Chem. & Drugg., 118, p. 106.

Reports that liquid extracts of squill, a rat poison, may be perfumed with aniseed.

H. B./

1933

Rat Poisons

Chem. & Drugg., 119, p. 464.

Gives formulas for rat poisons containing red squill and the directions for preparing them.

S., M.

1933

Phosphorus Rat Poisons

Chem. & Drugg., 118, p. 188.

Formulas for phosphorus rat poisons and the directions for preparing them are given.

P., C. V.

1936

Phosphorus in Rat Poisons

Chem. & Drugg., 125, p. 536.

Comments on the variation in the percentage of phosphorus in rat poisons.

S., C. S.

1936

Rat Poisons

Chem. & Drugg., 125, p. 96.

Gives a formula for a rat poison containing red squill and the directions for preparing it.

Cutter, I. S.

1937

How to Keep Well -- War against Rats

Chicago Daily Trib., Fri., Oct. 22., p. 14

Discusses the loss caused by rats and then recommends a bait consisting of barium carbonate, and thallium sulphate. The former may be mixed with ground hamburger, vegetables, or cheese, bread, and grain; the latter is prepared with a starch paste.

(Editor)

1937

Day by day story of the experimental forms -
Rat Campaign goes on.

Chicago Daily Trib., Fri., Feb. 19, p. 17.

Reports that rat squill, as it is used on the Tribune Experimental Farms, in the extermination of rats, is not poisonous to chickens, dogs, or other farm residents. Also reports that government tests show that a grain of squill powder (of high potency) will kill a rat weighing a half a pound in less than 3 days.

(Editor)

1937

Poison set out in state dooms thousands of rats.

The Milwaukee Journ., Thurs., Nov. 4, p. 1.

Federal authorities and county agents prepared a mixture of fresh meat and fish, garnished with red squill, the inner scale of a bulb native to India and the eastern colonies of Great Britain. Since the rat has no bile to produce vomiting the squill is fatal to the rat.

Rat Poison

Beloit Daily News, Dec. 29, 1937, p. 13.

At the Indianapolis meeting of the American Association for the Advancement of Science it was reported that an extract of red squill, a plant found only on the shores of the Mediterranean Sea yields a rat poison that is deadly to rodents but harmless to humans.

Munch, J.C., Ward, J.C., Mills, E.M.,
Buck, R.E., and Jarvis, F.N.

1937

Red Squill, Bioassay Methods

J. A. Ph. A., 26, No. 1, p. 27.

Reports the method of bioassay of red squill and gives a table of results as to the toxicity of red squill to male rats

Munch, J.C., Ward, J.E. & Garlough, F.E.

1937

Strychnine. The toxicity of Nux vomica Preparations

J. A. Ph. A., 26, No. 1, p. 29.

Reports in a table form the toxicity of nux vomica to rats and mice under various conditions.

Silver, J.

1937

The House Rat

U.S. Dept. Agr., Circular No. 423.

Describes rats in the following ways- a public menace, classification, introduction and spread, description, breeding, their abundance, economic status, relation to health, the absence of rat utilization, and finally the depression of rats. Recommends poison baits, traps, and calcium cyanide in gassing rats in their burrows. The primary recommendation is red squill.

List of Books Consulted:

Barkley, H. C., Studies in the Art of Rat-catching,
popular ed., 1896.

Hogarth, A.M., The Rat, A World Menace, 112 pp., 1929.

Hovell, M., Rats and How to Destroy Them, 465 pp., 1924.

Lyons, A. B., Plant Names - Scientific and Popular,
1 ed., 1900.

Shiple, A. E., Rats and their Animal Parasites, pp.23, 1908.

Wardle, R. A. The Principles of Applied Zoology, 1 ed., 1929.

List of Journals Consulted:

Am(eric)an Journ(al of) Pharm(acy), (62-99) (1890-1927).

Chem(ist) & Drugg(ist), (86-125) (1915-1936).

J(ournal of the) A(merican) Ph(armaceutical) A(ssociation),
(1-26) (1919-1937).

Pharm(aceutical) Era, (1-67) (1887-1930).

Science, (61-84) (1924-1936).

Squibb Abstract Bull(etin), (2-9) (1929-1936).

Approved W. O. Richtmann.

Prof. of Pharmacology

Date _____